



Rhode Island Energy Efficiency and Resources Management Council (EERMC) - Residential Survey and Commercial/ Industrial On - Sites Appendix G.



KEMA, Inc., Burlington, Massachusetts, August 26, 2010



Table of Contents

1. Introduction	1-1
2. Methodology	2-1
3. Summary of Findings	3-1
3.1 Housing Characteristics.....	3-1
3.2 Program Awareness	3-14
3.3 Energy Star Awareness.....	3-17
3.4 Weatherization and Building Envelope.....	3-43
3.5 Home Cooling.....	3-51
3.6 Dehumidifiers.....	3-62
3.6 Home Heating.....	3-64
3.7 Water Heating.....	3-88
3.8 Kitchen Appliances	3-98
3.9 Laundry Appliances	3-115
3.10 Lighting	3-124
3.11 Pools.....	3-131
3.12 Appliances	3-137
4. Demographics.....	4-1
Commercial On- Sites – to be added.....	1
Industrial On –Sites to be added.....	6

List of Tables:

Table 2-1: Summary of Research and Analysis Efforts	2-1
Table 3-1: Home Type	3-1
Table 3-2: Home Ownership	3-2
Table 3-3 : Date of Home Construction	3-4
Table 3-4: Home Occupancy Schedule	3-5
Table 3-5: Length of Residency	3-7
Table 3-6: Square Footage	3-8
Table 3-7: Electric Bill Responsibility	3-9
Table 3-8: Monthly Electric Bill.....	3-10
Table 3-9: Gas Bill Responsibility	3-11
Table 3-10: Monthly Gas Bill.....	3-12

Table of Contents

Table 3-11: Energy Star Labeled/Certified Home	3-13
Table 3-12: Program Awareness	3-15
Table 3-13: Program Participation	3-16
Table 3-14: Repeat Participation	3-17
Table 3-15: Energy Star Awareness	3-18
Table 3-16: Energy Star Central Air Conditioner Ownership	3-20
Table 3-17: Energy Star Room Air Conditioner Ownership	3-21
Table 3-18: Energy Star Room A/C Units per Home	3-21
Table 3-19: Energy Star Dehumidifier Ownership	3-22
Table 3-20: Energy Star Dehumidifiers per Home	3-23
Table 3-21: Energy Star Primary Heating System	3-24
Table 3-22: Energy Star Secondary Heating Systems	3-25
Table 3-23: Energy Star Secondary Heating Systems per Home	3-26
Table 3-24: Energy Star Water Heaters	3-27
Table 3-25: Energy Star Water Heaters per Home	3-28
Table 3-26: Energy Star Primary Refrigerator Ownership	3-29
Table 3-27: Energy Star Secondary Refrigerator	3-30
Table 3-28: Energy Star Stand Alone Freezer	3-31
Table 3-29: Energy Star Stand Alone Freezers per Home	3-32
Table 3-30: Energy Star Dishwashers	3-33
Table 3-31: Energy Star Clothes Washer	3-34
Table 3-32: Energy Star Desktop Computer	3-35
Table 3-33: Energy Star Desktop Computers per Home	3-36
Table 3-34: Energy Star Laptop Computer Ownership	3-37
Table 3-35: Energy Star Laptops per Home	3-38
Table 3-36: Energy Star Television Ownership	3-39
Table 3-37: Number of Energy Star Televisions per Home	3-40
Table 3-38: Energy Star Windows	3-41
Table 3-39: Number of Energy Star Windows	3-42
Table 3-40: Exterior Wall Insulation	3-44
Table 3-41: Floor Insulation	3-44
Table 3-42: Attic/Ceiling Insulation	3-45
Table 3-43: Attic/Ceiling Insulation Thickness	3-46

Table of Contents

Table 3-44: Window Type	3-47
Table 3-45: Gas-filled Double Pane Windows	3-48
Table 3-46: Sealing of Leaky Ducts	3-49
Table 3-47: Central Air-Conditioning.....	3-52
Table 3-48: Age of Central Air Conditioning System	3-53
Table 3-49: Number of Homes Served by Central Air-Conditioning	3-54
Table 3-50: Central A/C System Maintenance.....	3-55
Table 3-51: Programmable Thermostat Use.....	3-56
Table 3-52: Central A/C Schedule (# of Days in Use)	3-57
Table 3-53: Central A/C Schedule (# of Hours in Use)	3-58
Table 3-54: Quantity of Room Air Conditioners	3-59
Table 3-55: Age of Room Air Conditioners	3-60
Table 3-56: Room A/C Schedule	3-61
Table 3-57: Room A/C Schedule (# of Hours in Use)	3-62
Table 3-58: Quantity of Dehumidifiers	3-63
Table 3-59: Dehumidifier Schedule (# of Days in Use).....	3-64
Table 3-60: Heating Fuel Type	3-65
Table 3-61: Heating System Type, Natural Gas	3-66
Table 3-62: Heating System Type, Bottled Gas or Propane.....	3-67
Table 3-63: Heating System Type, Electric Heating	3-68
Table 3-64: Heating System Type, Oil Heating.....	3-69
Table 3-65: Paying for Heat.....	3-70
Table 3-66: Homes on Heating System	3-71
Table 3-67: Age of Primary Heating System.....	3-72
Table 3-68: Energy Efficient Heating System Requests	3-73
Table 3-69: Programmable Thermostat for Heating	3-74
Table 3-70: Winter Temperature Settings.....	3-75
Table 3-71: Heating at Night or Not Home.....	3-76
Table 3-72: Heating System Maintenance.....	3-77
Table 3-73: Primary Heating Systems	3-78
Table 3-74: Resistance Heating.....	3-78
Table 3-75: Furnace Heating	3-79
Table 3-76: Gas or Boiler.....	3-80

Table of Contents

Table 3-77: Heat Pump System.....	3-81
Table 3-78: Portable Electric Heating	3-82
Table 3-79: Kerosene Heating.....	3-83
Table 3-80: Fixed gas space heater	3-83
Table 3-81: Gas Fireplace insert.....	3-84
Table 3-82: Wood burning fireplace.....	3-84
Table 3-83: Wood or Coal Stove.....	3-85
Table 3-84: Non-primary heating system use	3-86
Table 3-85: Percent of home heated by non-primary system	3-87
Table 3-86: Quantity of Water Heaters	3-88
Table 3-87: Water Heating Fuel Type.....	3-89
Table 3-88: Water Heater Type	3-90
Table 3-89: Incidence of Insulating Wrap or Blankets Around Hot Water Heaters	3-91
Table 3-90: Incidence of Pipe Wrapping Around Hot Water Pipes	3-92
Table 3-91: Location of Hot Water Heater	3-93
Table 3-92: Quantity of Shower Heads.....	3-94
Table 3-93: Quantity of Low-Flow Shower Heads	3-95
Table 3-94: Quantity of Sinks.....	3-96
Table 3-95: Quantity of Sinks with Faucet Aerators.....	3-97
Table 3-96: Quantity of Refrigerators.....	3-98
Table 3-97: Refrigerator Usage	3-99
Table 3-98: Age of Refrigerator	3-100
Table 3-99: Refrigerator Style.....	3-101
Table 3-100: Refrigerator Size.....	3-102
Table 3-101: Ice and Water Dispenser on Refrigerator	3-103
Table 3-102: Quantity of Stand-Alone Freezers	3-104
Table 3-103: Freezer Usage	3-105
Table 3-104: Freezer Age	3-106
Table 3-105: Freezer Style	3-107
Table 3-106: Freezer Size	3-108
Table 3-107: Dishwasher Use.....	3-109
Table 3-108: Dishwasher Age.....	3-110
Table 3-109: Number of Dishwasher Loads per Week	3-111

Table of Contents

Table 3-110: Oven Fuel	3-112
Table 3-111: Cook-Top/Burner Fuel	3-113
Table 3-112: Microwave Oven Use.....	3-114
Table 3-113: Clothes Washer Ownership	3-115
Table 3-114: Loads of Laundry per Week.....	3-116
Table 3-115: Clothes Washer Age	3-117
Table 3-116: Clothes Washer Type: Top Loading or Front-Loading?	3-118
Table 3-117: Clothes Dryer Ownership.....	3-119
Table 3-118: Clothes Dryer Fuel Type.....	3-120
Table 3-119: Clothes Dryer Age	3-121
Table 3-120: Moisture Sensor.....	3-122
Table 3-121: Amount of clothes dryer loads	3-123
Table 3-122: Compact Fluorescent Bulb Awareness.....	3-124
Table 3-123: CFL Purchases	3-125
Table 3-124: CFL Rebates.....	3-126
Table 3-125: CFL with No Rebate	3-127
Table 3-126: Lighting Products	3-129
Table 3-127: Standard Incandescent Lights Replaced with CFLs	3-130
Table 3-128: Light sockets that can not be modified to fit compact fluorescent lights	3-131
Table 3-129: Pool Ownership	3-132
Table 3-130: Pool Location	3-132
Table 3-131: Pool Type.....	3-133
Table 3-132: Pool Pump Use.....	3-133
Table 3-133: VSD Pool Pumps	3-134
Table 3-134: Pool Pumps Timers	3-135
Table 3-135: Pool Pumps Time of Use	3-136
Table 3-136: Ownership of Home Electronics and Appliances.....	3-137
Table 3-137: Desktop Computer Ownership.....	3-139
Table 3-138: Desktop Computer Shut Down Procedures.....	3-140
Table 3-139: Laptop Computer Ownership.....	3-141
Table 3-140: Laptop Computer Shut Down Procedures	3-142
Table 3-141: Electronic Vehicle Ownership	3-143
Table 4-1: Age	4-1

Table of Contents

Table 4-2: Household Income	4-2
Table 4-3: Head of Household Education	4-3
Table 4-4: Gender	4-4

List of Figures:

Figure 3-1: Home Type	3-2
Figure 3-2: Home Ownership	3-3
Figure 3-3: Date of Home Construction	3-5
Figure 3-4: Home Occupancy Schedule	3-6
Figure 3-5: Length of Residency	3-7
Figure 3-6: Square Footage	3-9
Figure 3-7: Electric Bill Responsibility	3-10
Figure 3-8: Monthly Electric Bill	3-11
Figure 3-9: Gas Bill Responsibility	3-12
Figure 3-10: Monthly Gas Bill	3-13
Figure 3-11: Energy Star Labeled/Certified Home	3-14
Figure 3-12: Program Awareness	3-15
Figure 3-13: Program Participation	3-16
Figure 3-14: Repeat Participation	3-17
Figure 3-15: Energy Star Awareness	3-18
Figure 3-16: Energy Star Appliance Ownership	3-19
Figure 3-17: Energy Star Central Air Conditioner Ownership	3-20
Figure 3-18: Energy Star Room Air Conditioner Ownership	3-21
Figure 3-19: Energy Star Room A/C Units per Home	3-22
Figure 3-20: Energy Star Dehumidifier Ownership	3-23
Figure 3-21: Energy Star Dehumidifiers per Home	3-24
Figure 3-22: Energy Star Primary Heating System	3-25
Figure 3-23: Energy Star Secondary Heating Systems	3-26
Figure 3-24: Energy Star Secondary Heating Systems per Home	3-27
Figure 3-25: Energy Star Water Heaters	3-28
Figure 3-26: Energy Star Water Heaters per Home	3-29
Figure 3-27: Energy Star Primary Refrigerator Ownership	3-30

Table of Contents

Figure 3-28: Energy Star Secondary Refrigerator	3-31
Figure 3-29: Energy Star Stand Alone Freezer.....	3-32
Figure 3-30: Energy Star Stand Alone Freezers per Home	3-33
Figure 3-31: Energy Star Dishwashers	3-34
Figure 3-32: Energy Star Clothes Washer	3-35
Figure 3-33: Energy Star Desktop Computer.....	3-36
Figure 3-34: Number of Energy Star Desktop Computers	3-37
Figure 3-35: Energy Star Laptop Computer Ownership.....	3-38
Figure 3-36: Energy Star Laptops per Home	3-39
Figure 3-37: Energy Star Television Ownership	3-40
Figure 3-38: Number of Energy Star Televisions per Home	3-41
Figure 3-39: Energy Star Windows	3-42
Figure 3-40: Number of Energy Star Windows	3-43
Figure 3-41: Exterior Wall Insulation	3-44
Figure 3-42: Floor Insulation	3-45
Figure 3-43: Attic/Ceiling Insulation	3-46
Figure 3-44: Attic/Ceiling Insulation Thickness	3-47
Figure 3-45: Window Type.....	3-48
Figure 3-46: Gas-filled Double Pane Windows	3-49
Figure 3-47: Sealing of Leaky Ducts.....	3-50
Figure 3-48: Reasons for Sealing Leaky Ducts	3-51
Figure 3-49: Central Air-Conditioning	3-52
Figure 3-50: Age of Central Air Conditioning System	3-53
Figure 3-51: Number of Homes Served by Central Air-Conditioning	3-54
Figure 3-52: Central A/C System Maintenance	3-55
Figure 3-53: Programmable Thermostat for Central A/C	3-56
Figure 3-54: Central A/C Schedule (# of Days in Use)	3-57
Figure 3-55: Central A/C Schedule (# of Hours in Use).....	3-58
Figure 3-56: Quantity of Room Air Conditioners	3-59
Figure 3-57: Age of Room Air Conditioning Systems	3-60
Figure 3-58: Room A/C Schedule	3-61
Figure 3-59: Room A/C Schedule (# of Hours in Use).....	3-62
Figure 3-60: Quantity of Dehumidifiers	3-63

Table of Contents

Figure 3-61: Dehumidifier Schedule (# of Days in Use).....	3-64
Figure 3-62: Heating Fuel Type	3-65
Figure 3-63: Heating System Type, Natural Gas	3-66
Figure 3-64: Heating System Type, Bottled Gas or Propane.....	3-67
Figure 3-65: Heating System Type, Electric Heating	3-68
Figure 3-66: Heating System Type, Oil Heating	3-69
Figure 3-67: Paying for Heat.....	3-70
Figure 3-68: Homes on Heating System.....	3-71
Figure 3-69: Age of Primary Heating System	3-72
Figure 3-70: Energy Efficient Heating System Requests.....	3-73
Figure 3-71: Programmable Thermostat for Heating	3-74
Figure 3-72: Winter Temperature Settings.....	3-75
Figure 3-73: Heating at Night or Not Home	3-76
Figure 3-74: Heating System Maintenance.....	3-77
Figure 3-75: Primary Heating Systems	3-78
Figure 3-76: Resistance Heating	3-79
Figure 3-77: Furnace Heating	3-80
Figure 3-78: Gas or Boiler.....	3-81
Figure 3-79: Heat Pump System.....	3-82
Figure 3-80: Portable Electric Heating	3-83
Figure 3-81: Gas fireplace insert.....	3-84
Figure 3-82: Wood burning fireplace.....	3-85
Figure 3-83: Wood or Coal Stove	3-86
Figure 3-84: Non-primary heating system use	3-87
Figure 3-85: Percent of home heated by non-primary system.....	3-88
Figure 3-86: Quantity of Water Heaters	3-89
Figure 3-87: Water Heating Fuel Type.....	3-90
Figure 3-88: Water Heater Type	3-91
Figure 3-89: Incidence of Insulating Wrap or Blankets Around Hot Water Heaters	3-92
Figure 3-90: Incidence of Pipe Wrapping Around Hot Water Pipes	3-93
Figure 3-91: Location of Hot Water Heater	3-94
Figure 3-92: Quantity of Shower Heads.....	3-95
Figure 3-93: Quantity of Low-Flow Shower Heads	3-96

Table of Contents

Figure 3-94: Quantity of Sinks	3-97
Figure 3-95: Quantity of Sinks with Faucet Aerators	3-98
Figure 3-96: Quantity of Refrigerators	3-99
Figure 3-97: Refrigerator Usage	3-100
Figure 3-98: Age of Refrigerator	3-101
Figure 3-99: Refrigerator Style.....	3-102
Figure 3-100: Refrigerator Size.....	3-103
Figure 3-101: Ice and Water Dispenser on Refrigerator	3-104
Figure 3-102: Quantity of Stand-Alone Freezers	3-105
Figure 3-103: Freezer Usage.....	3-106
Figure 3-104: Freezer Age.....	3-107
Figure 3-105: Freezer Style	3-108
Figure 3-106: Freezer Size	3-109
Figure 3-107: Dishwasher Use	3-110
Figure 3-108: Dishwasher Age	3-111
Figure 3-109: Number of Dishwasher Loads per Week.....	3-112
Figure 3-110: Oven Fuel.....	3-113
Figure 3-111: Cook-Top/Burner Fuel	3-114
Figure 3-112: Microwave Oven Use	3-115
Figure 3-113: Clothes Washer Ownership.....	3-116
Figure 3-114: Loads of Laundry per Week	3-117
Figure 3-115: Clothes Washer Age.....	3-118
Figure 3-116: Clothes Washer Type: Top Loading or Front-Loading?.....	3-119
Figure 3-117: Clothes Dryer Ownership	3-120
Figure 3-118: Clothes Dryer Fuel Type.....	3-121
Figure 3-119: Clothes Dryer Age	3-122
Figure 3-120: Moisture Sensor	3-123
Figure 3-121: Amount of clothes dryer loads	3-124
Figure 3-122: Compact Fluorescent Bulb Awareness	3-125
Figure 3-123: CFL Purchases.....	3-126
Figure 3-124: CFL Rebates	3-127
Figure 3-125: CFL with No Rebate	3-128
Figure 3-126: Standard Incandescent Lights Replaced with CFLs.....	3-130

Table of Contents

Figure 3-127: Light sockets that can not be modified to fit compact fluorescent lights.....	3-131
Figure 3-128: Pool Ownership	3-132
Figure 3-129: Pool Location.....	3-133
Figure 3-130: Pool Pump Use.....	3-134
Figure 3-131: VSD Pool Pumps.....	3-135
Figure 3-132: Pool Pumps Timers	3-136
Figure 3-133: Pool Pumps Time of Use	3-137
Figure 3-134: Desktop Computer Ownership	3-139
Figure 3-135: Desktop Computer Shut Down Procedures.....	3-140
Figure 3-136: Laptop Computer Ownership.....	3-141
Figure 3-137: Laptop Computer Shut Down Procedures.....	3-142
Figure 3-138: Electronic Vehicle Ownership.....	3-143
Figure 4-1: Household Income.....	4-2
Figure 4-2: Head of Household Education.....	4-3
Figure 4-3: Gender.....	4-4

1. Residential Survey Results

Introduction

KEMA is pleased to present the results of the *2009 Rhode Island EERMC Residential Survey* designed to assist in understanding the quantity and types of appliances owned by customers located in National Grid's Rhode Island service territory. The survey was designed to provide National Grid with current data to support resource planning, program planning and improved characterization of the residential market including:

- Saturation of energy end-uses by type
- Penetration of energy efficient equipment by end use
- Trends in energy efficiency purchase behavior
- Awareness and interest in National Grid program offerings

This report only addresses the residential sector. This data is critical to the development of up-to-date energy use information by fuel, sector and end-use necessary to determine the baseline conditions and develop an estimate of the potential savings from energy efficiency in National Grid's service territory.

This report is based on a computer assisted telephone interview (CATI) administered to 300 residential households in National Grid's Rhode Island service territory during June of 2009. The survey sought to determine the following characteristics of residential housing:

- Dwelling type along a variety of indices including ownership, age and size
- Insulation
- Windows
- Space heating & cooling
- Water heating
- Dehumidifiers
- Lighting
- Appliances including refrigerators, freezers, dishwashers, cooking, laundry
- Pool
- Electric plug loads (e.g., computers, office machines, televisions, fans, hybrid vehicles)

The survey also sought to determine respondents' awareness of and attitudes towards:

- National Grid energy efficiency programs
- Energy Star branding and equipment

Additionally, the survey included basic questions on household demographics to allow for segmentation of results along these lines.

Section 2 of this report discusses the methodology used in the study. Section 3 is a summary of findings on homes and equipment. Section 4 presents the demographic data of the respondents. Section 5 is an appendix containing the survey instrument.

2. Methodology

National Grid retained KEMA to oversee all facets of the *2009 Rhode Island EERMC Residential Survey*. These aspects included sample design, survey design (i.e., item generation, coding, computer programming), data analysis and report preparation. Drafts of the *Rhode Island EERMC Residential Survey* were reviewed and approved by National Grid officials.

National Grid provided KEMA with a list of 56,520 residential electricity customers obtained from a 2008 billing database. KEMA used simple random sampling to randomly select 3,000 addresses from this revised list. In simple random sampling each house in the population is given an equal chance to be selected into the sample. Results are calculated for the sample, which serve as an unbiased estimator of the population. Results for the sample are then projected back to the population to estimate the savings potential for the population. Simple random sampling is well suited for residential sample designs because the projects do not vary substantially in size.

This information was then sent to a CATI vendor in order to obtain completed surveys from 300 electric customers to provide a statistically valid representation of the NIPSCO residential service territory. As a point of reference, The *Rhode Island EERMC Residential Survey* experienced a 10% response rate on the CATI survey. This percentage is representative of most CATI surveys conducted with residential households having response rates under 25%. The average time to complete the survey was 24 minutes.

Table 2-1 provides an overview of the principal data collection and analysis efforts for the study.

Table 2-1: Summary of Research and Analysis Efforts

Population / Summary of Topics Covered	Sample Frame	Sample Size and Other Details
Residential DSM Potential Survey Estimate saturation of key electric end-uses Assess awareness and interest of National Grid energy efficiency programs Assess awareness and purchasing of ENERGY STAR brand appliances	2008 National Grid billing database	300: Represents a margin for error of +/- 4% at the midpoint of a 90% confidence level. KEMA believes that estimates with this precision are usable for resource and program planning purposes.

3. Summary of Findings

Readers are reminded that this section summarizes the information collected from a random sample telephone survey conducted among National Grid electric customers in Rhode Island.

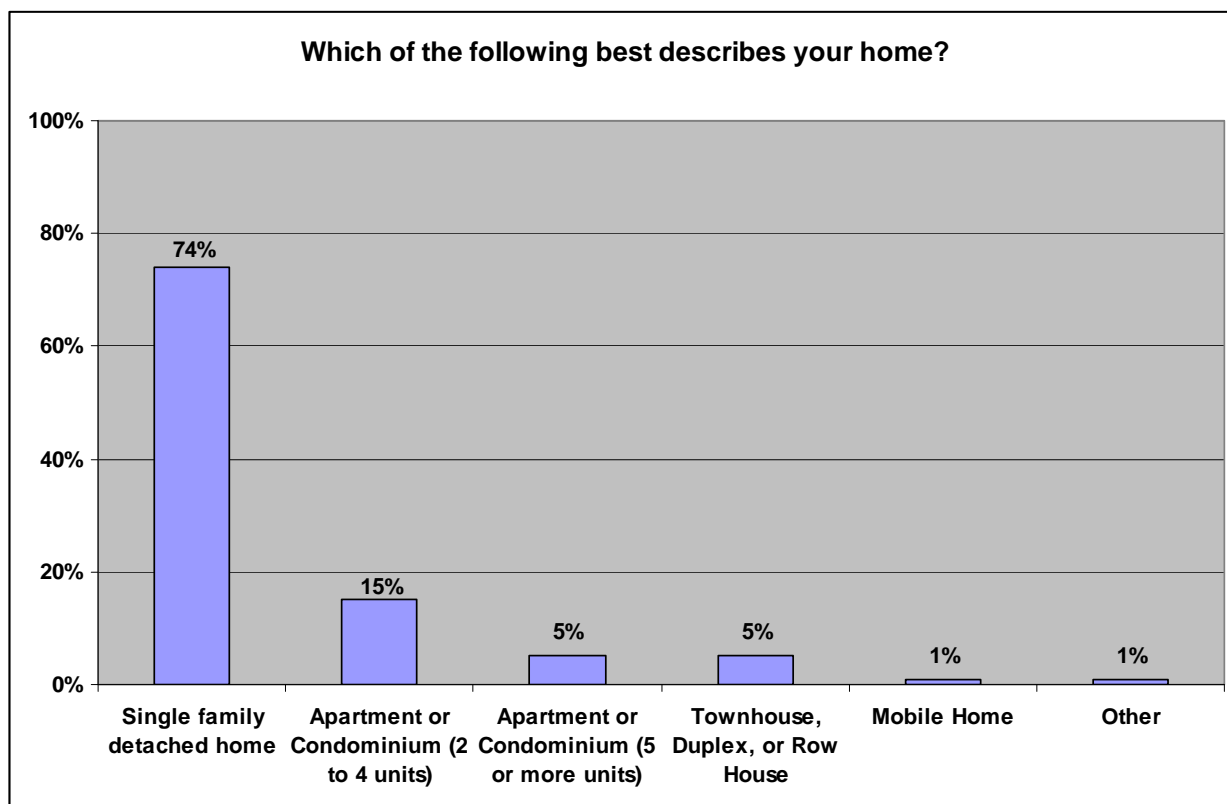
3.1 Housing Characteristics

All respondents were initially asked to indicate the type of home in which they live. The majority of respondents (74%) indicate living in a single family detached home.

Table 3-1: Home Type

<i>Home type</i>	<i>Frequency (N)</i>	<i>Percent (%)</i>
Single family detached home	221	74%
Apartment or Condominium (2 to 4 units)	14	15%
Apartment or Condominium (5 or more units)	46	5%
Townhouse, Duplex, or Row House	15	5%
Mobile Home	2	1%
Other	2	1%
Total	300	100%

Figure 3-1: Home Type



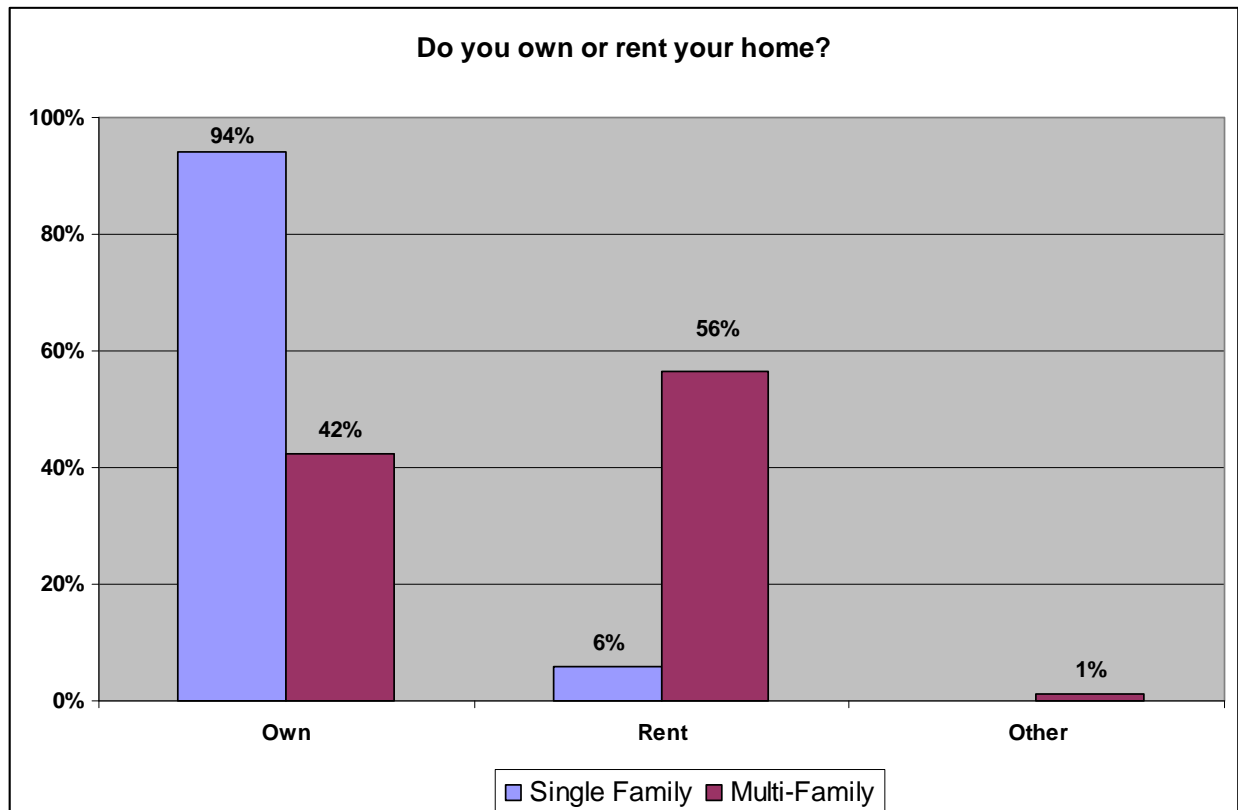
Ownership is a strong indicator of the willingness to invest in energy efficiency, or any other capital improvements. The survey asked about ownership and discovered that 81% of residents owned their dwelling.

Table 3-2: Home Ownership

<i>Do you own or rent your home?</i>	<i>Single Family</i>		<i>Multi-Family</i>		<i>Total</i>	
	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>
Own	209	94%	33	42%	242	81%
Rent	13	6%	44	56%	57	19%
Other	0	0%	1	1%	1	0%
Total	222	100%	78	100%	300	100%

Looking at Figure 3-2, it appears that residential home ownership is much more likely to occur for single family homes than multi-family homes.

Figure 3-2: Home Ownership

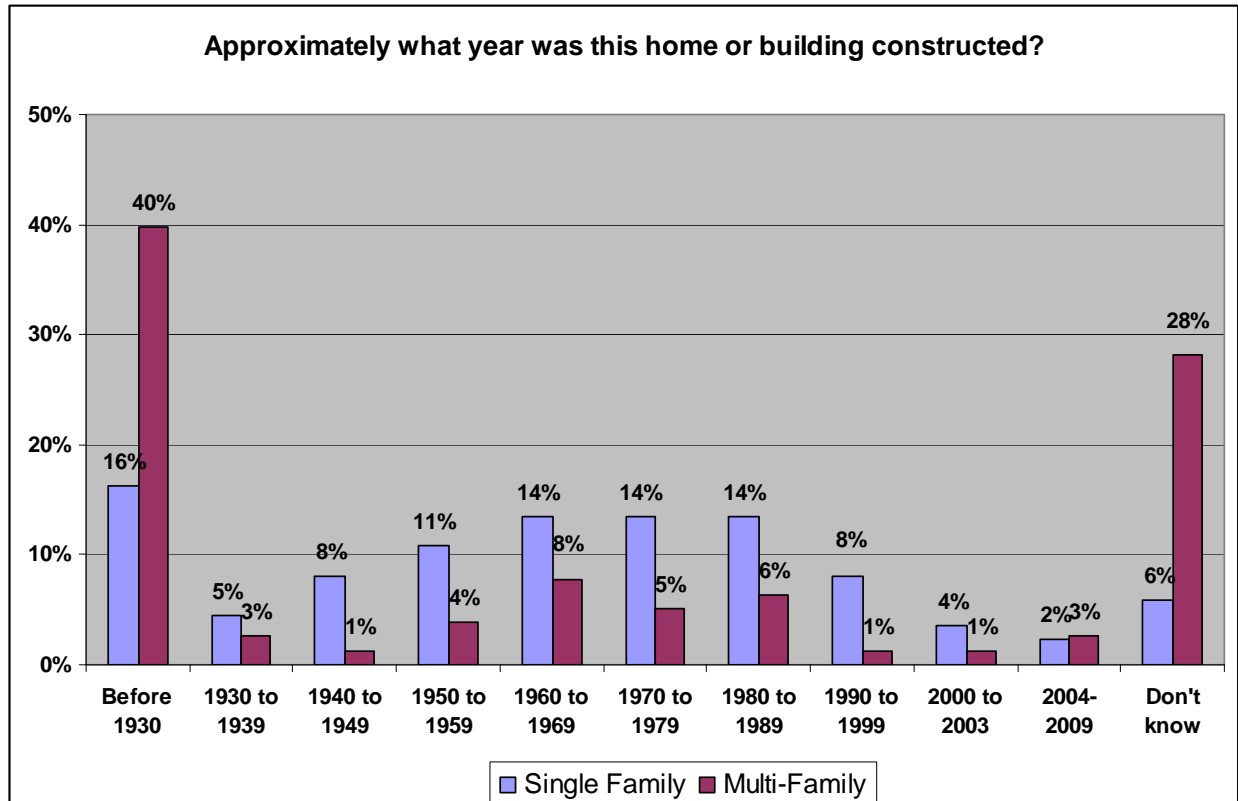


All respondents were asked to report the year in which their home was constructed. The results indicate that about half of the homes (41%) were built prior to 1960. The significant majority of homes (77%) were built prior to 1990.

Table 3-3 : Date of Home Construction

<i>Year home was constructed</i>	<i>Single Family</i>		<i>Multi-Family</i>		<i>Total</i>	
	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>
Before 1930	36	16%	31	40%	67	22%
1930 to 1939	10	5%	2	3%	12	4%
1940 to 1949	18	8%	1	1%	19	6%
1950 to 1959	24	11%	3	4%	27	9%
1960 to 1969	30	14%	6	8%	36	12%
1970 to 1979	30	14%	4	5%	34	11%
1980 to 1989	30	14%	5	6%	35	12%
1990 to 1999	18	8%	1	1%	19	6%
2000 to 2003	8	4%	1	1%	9	3%
2004-2009	5	2%	2	3%	7	2%
Don't know	13	6%	22	28%	35	12%
Total	222	100%	78	100%	300	100%

Figure 3-3: Date of Home Construction

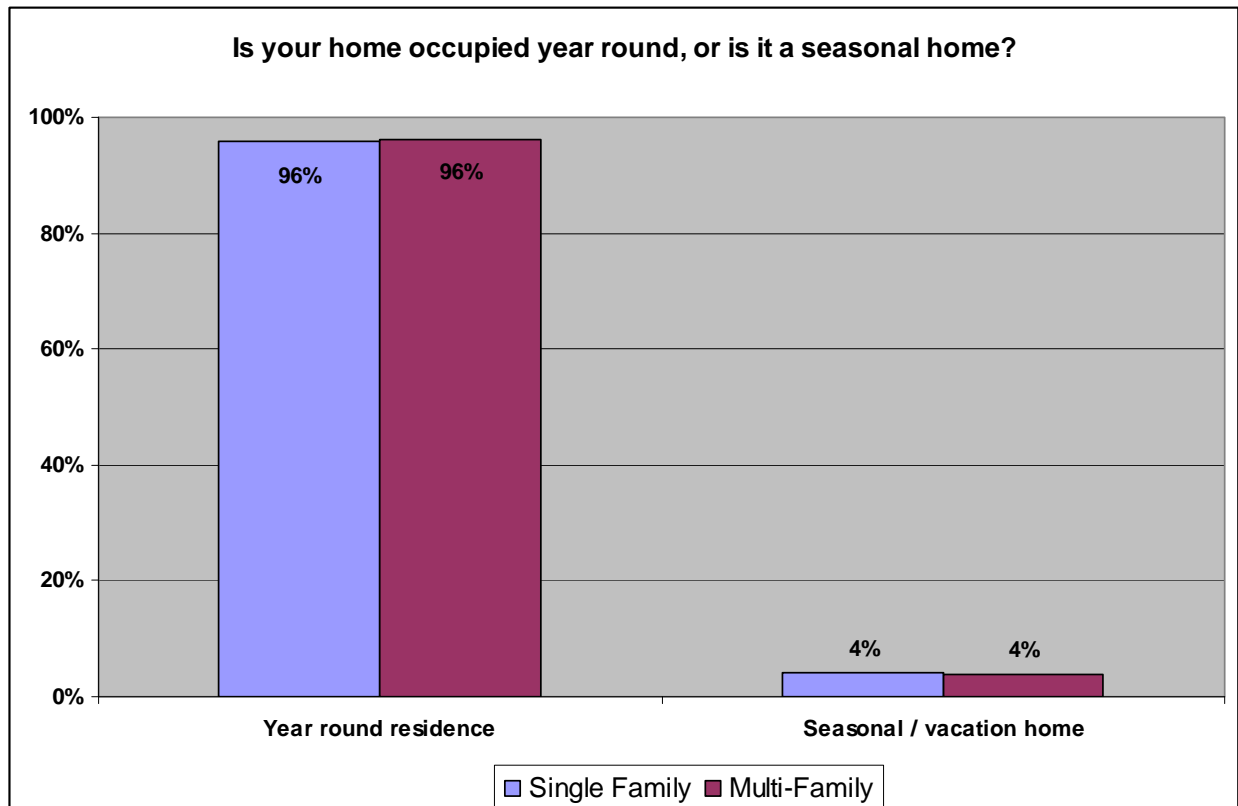


Respondents were asked to indicate if their home is occupied year-round or if it is a seasonal residence. Nearly all residents (96%) occupy their homes on a year-round basis.

Table 3-4: Home Occupancy Schedule

Year-Round or Seasonal Residence?	Single Family		Multi-Family		Total	
	N	%	N	%	N	%
Year-round	213	96%	75	96%	288	96%
Seasonal	9	4%	3	4%	12	4%
Total	222	100%	78	100%	300	100%

Figure 3-4: Home Occupancy Schedule



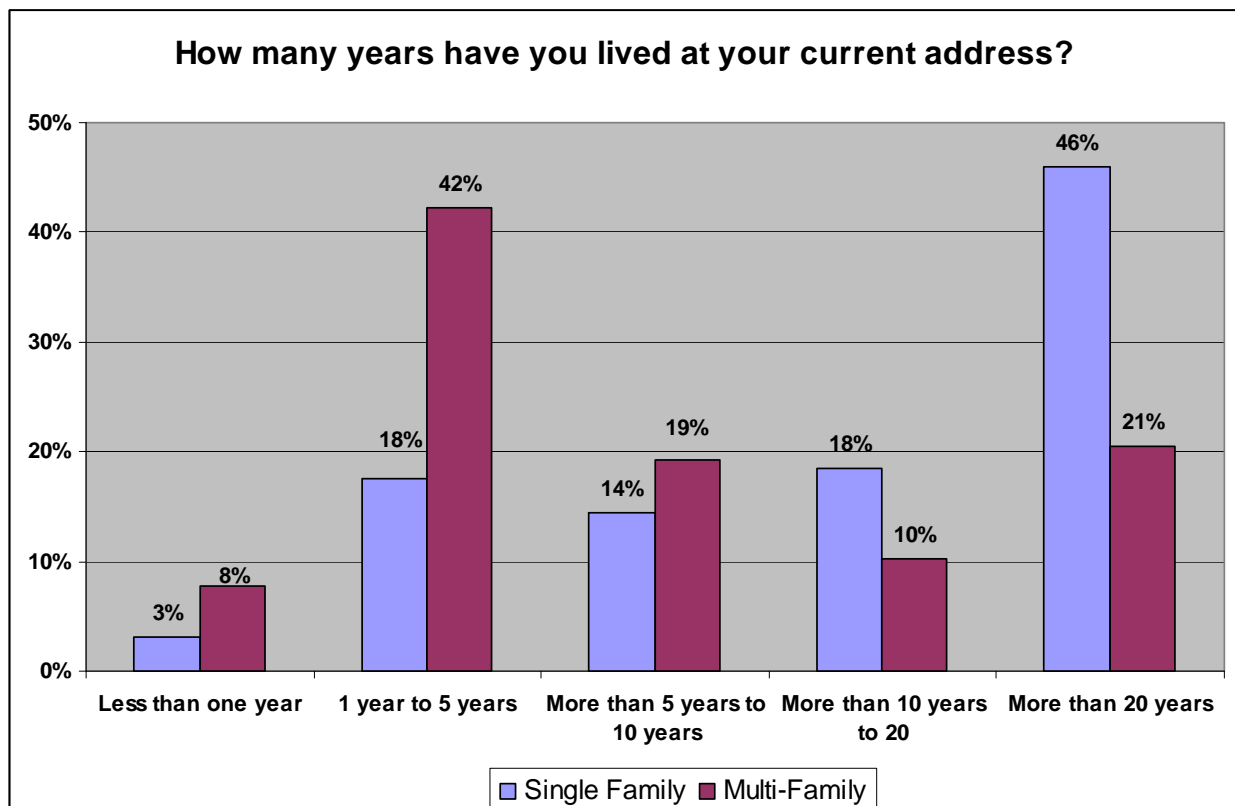
Respondents were also asked to indicate the length of residency at their current address.

The majority of single family residents (64%) report a length of residency *greater than* 10 years. In contrast, the majority of multi-family respondents (69%) indicate a length of residency of 10 years or *less*.

Table 3-5: Length of Residency

<i>Years at current address</i>	<i>Single Family</i>		<i>Multi-Family</i>		<i>Total</i>	
	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>
Less than one year	7	3%	6	8%	13	4%
1 year to 5 years	39	18%	33	42%	72	24%
More than 5 years to 10 years	32	14%	15	19%	47	16%
More than 10 years to 20	41	18%	8	10%	49	16%
More than 20 years	102	46%	16	21%	118	39%
Refused	1	0%	0	0%	1	0%
Total	222	100%	78	100%	300	100%

Figure 3-5: Length of Residency

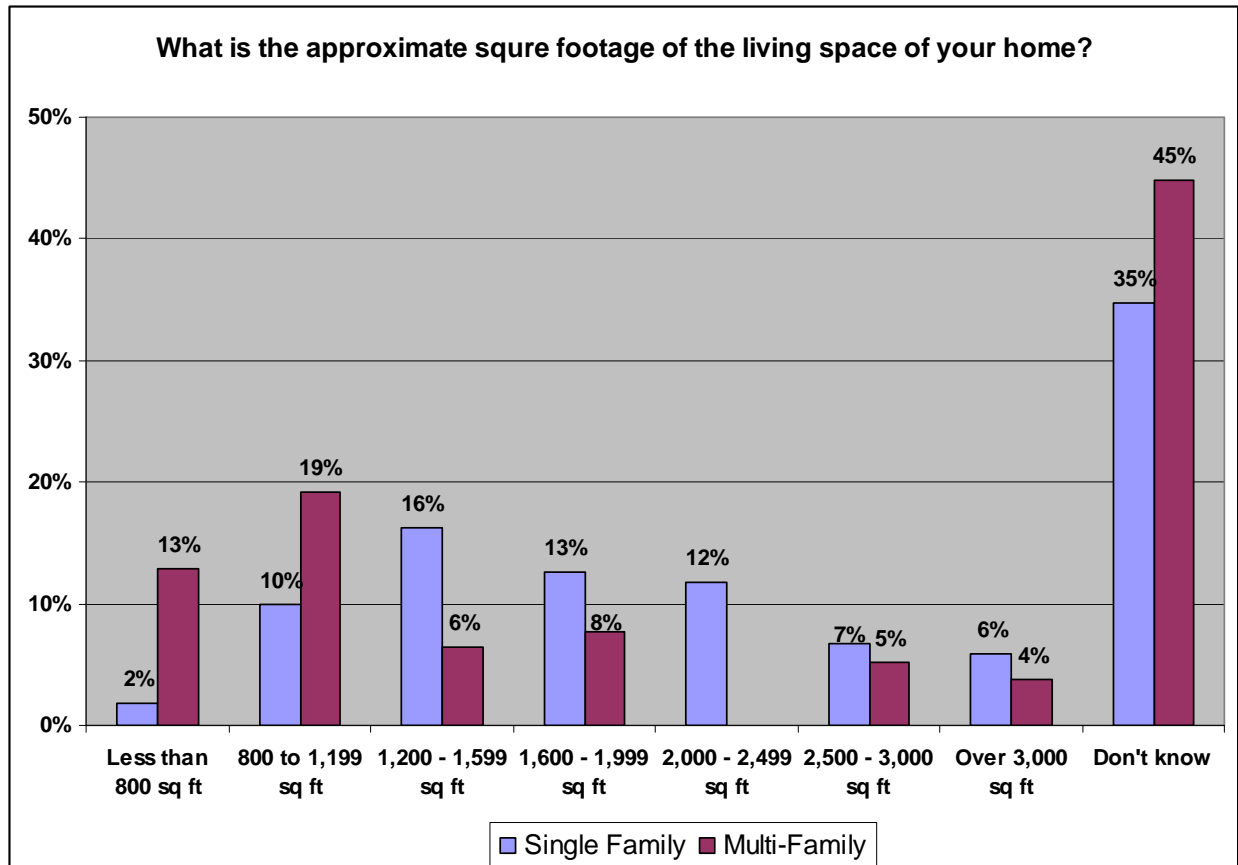


Respondents were asked to report the approximate square footage of their home. Estimates of home size were widely distributed. Over one third of residents surveyed (37%) report not knowing an estimate of the size of their home.

Table 3-6: Square Footage

Size of home	Single Family		Multi-Family		Total	
	N	%	N	%	N	%
Less than 800 square feet	4	2%	10	13%	14	5%
800 to 1,199 square feet	22	10%	15	19%	37	12%
1,200 – 1,599 square feet	36	16%	5	6%	41	14%
1,600 – 1,999 square feet	28	13%	6	8%	34	11%
2,000 – 2,499 square feet	26	12%	0	0%	26	9%
2,500 – 3,000 square feet	15	7%	4	5%	19	6%
Over 3,000 square feet	13	6%	3	4%	16	5%
Don't know	77	35%	35	45%	112	37%
Refused to answer	1	0%	0	0%	1	0
Total	222	100%	78	100%	300	100%

Figure 3-6: Square Footage

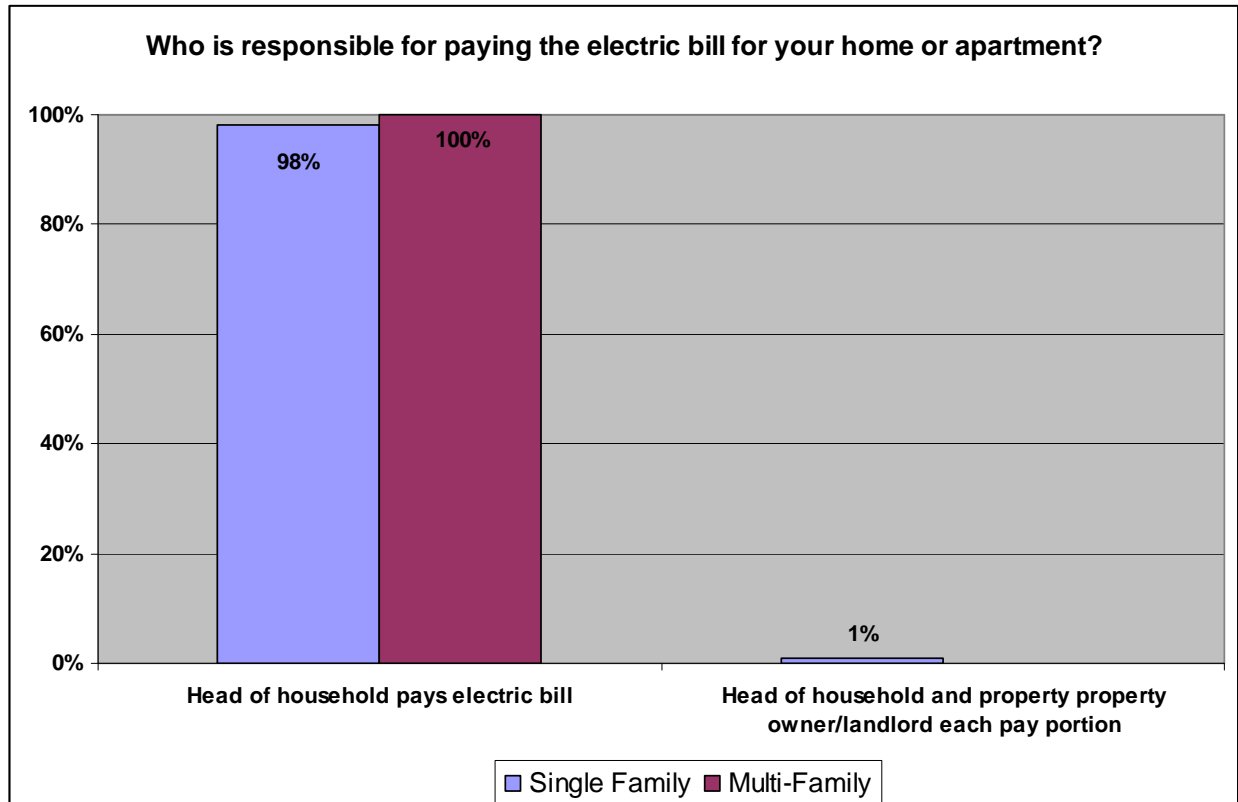


The head of the household in both single and multi-family homes almost always pays the electric bill (99%), without a landlord providing disbursement.

Table 3-7: Electric Bill Responsibility

Who is responsible for paying the electric bill for your home or apartment?	Single Family		Multi-Family		Total	
	N	%	N	%	N	%
Head of household pays electric bill	218	98%	78	100%	296	99%
Head of household and property owner/landlord each pay portion	2	1%	0	0%	2	1%
Property owner/landlord pays electric bill	1	0%	0	0%	1	0%
Refused	1	0%	0	0%	1	0%
Total	222	100%	78	100%	300	100%

Figure 3-7: Electric Bill Responsibility

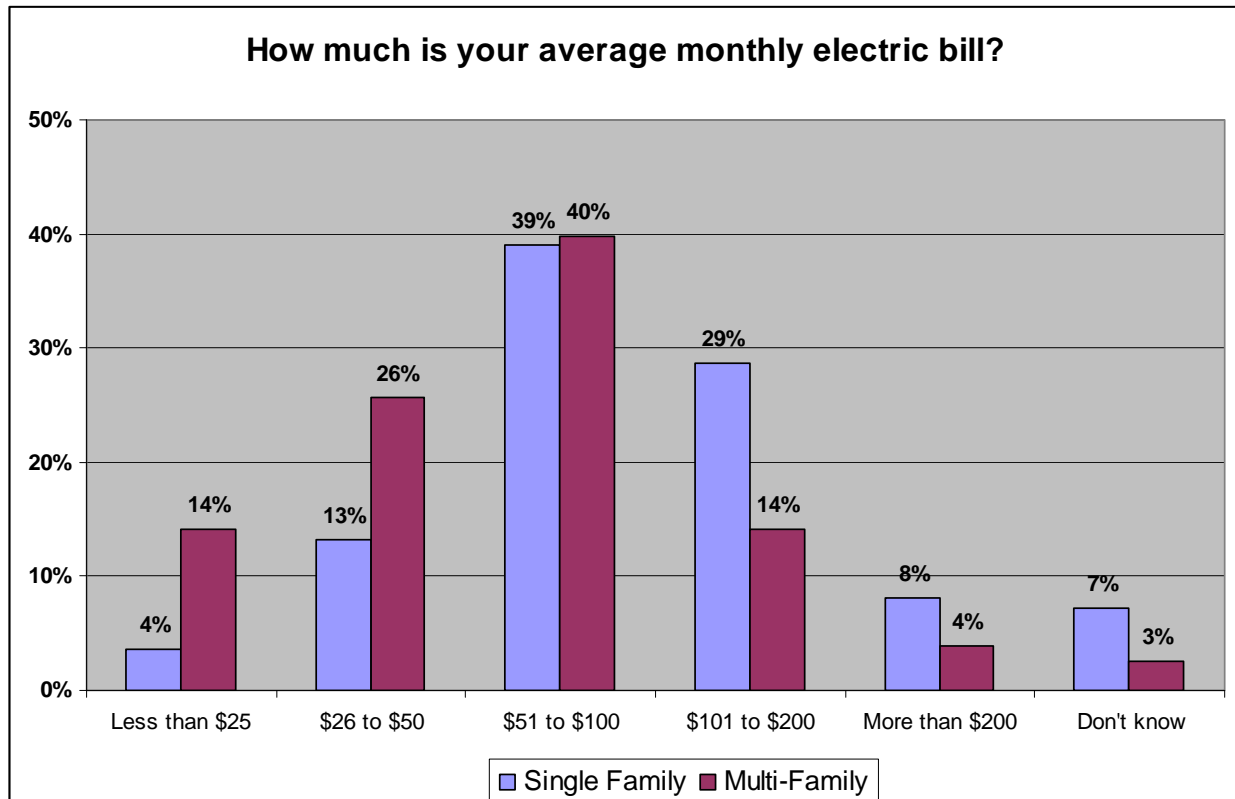


Respondents were also asked to indicate the dollar amount of their average monthly electric bill. Over a third of all respondents (39%) indicate their average monthly electric bill is between \$51 to \$100 and a quarter of residents surveyed report their average electric bill is between \$101 to \$200 per month.

Table 3-8: Monthly Electric Bill

Monthly Electric Bill	Single Family		Multi-Family		Total	
	N	%	N	%	N	%
Less than \$25	8	4%	11	14%	19	6%
\$26 to \$50	29	13%	20	26%	49	16%
\$51 to \$100	86	39%	31	40%	117	39%
\$101 to \$200	63	29%	11	14%	74	25%
More than \$200	18	8%	3	4%	21	7%
Don't know	16	7%	2	3%	18	6%
Total	220	100%	78	100%	298	100%

Figure 3-8: Monthly Electric Bill

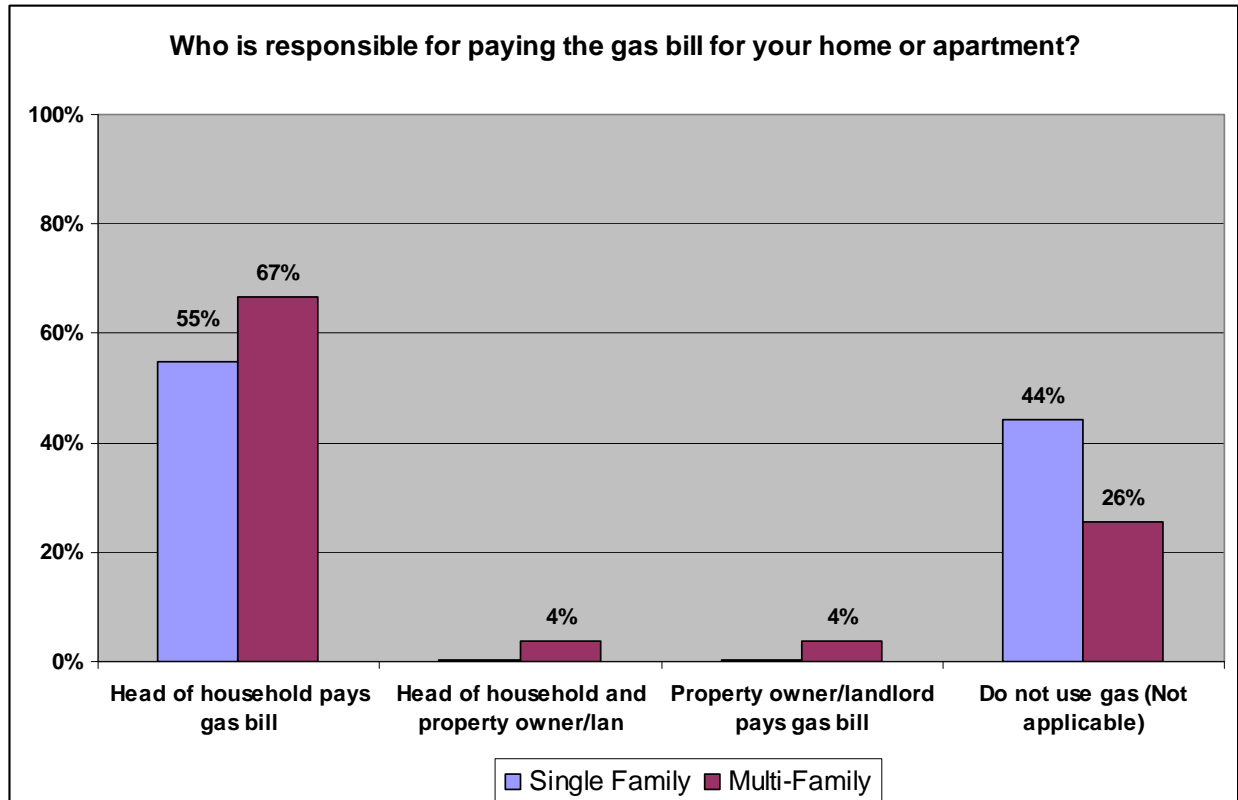


In homes with gas, the head of the household in both single and multi-family homes almost always pays the gas bill, without a landlord providing disbursement. However, it is important to note that 39% of the sample reports not using gas.

Table 3-9: Gas Bill Responsibility

<i>Who is responsible for paying the gas bill for your home or apartment?</i>	<i>Single Family</i>		<i>Multi-Family</i>		<i>Total</i>	
	N	%	N	%	N	%
Head of household pays gas bill	122	55%	52	67%	174	58%
Head of household and property owner/landlord each pay portion	1	0%	3	4%	4	1%
Property owner/landlord pays gas bill	1	0%	3	4%	4	1%
Do not use gas (Not applicable)	98	44%	20	26%	118	39%
Total	222	100%	78	100%	300	100%

Figure 3-9: Gas Bill Responsibility

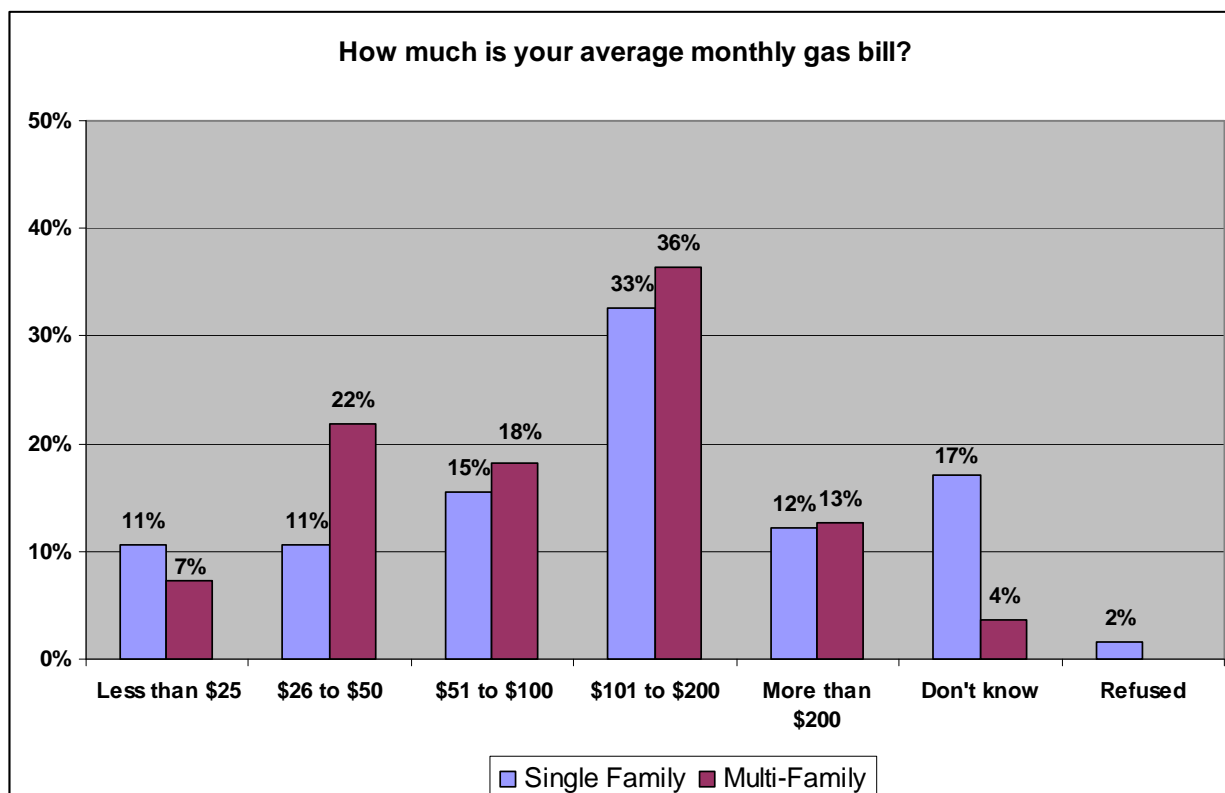


Respondents were also asked to indicate the dollar amount of their average monthly gas bill. Gas customers appear to pay higher monthly bills than electricity customers, as over a third of all respondents (34%) indicate their average monthly gas bill is between \$101 to \$200.

Table 3-10: Monthly Gas Bill

Monthly Gas Bill	Single Family		Multi-Family		Total	
	N	%	N	%	N	%
Less than \$25	13	11%	4	7%	17	10%
\$26 to \$50	13	11%	12	22%	25	14%
\$51 to \$100	19	15%	10	18%	29	16%
\$101 to \$200	40	33%	20	36%	60	34%
More than \$200	15	12%	7	13%	22	12%
Don't know	21	17%	2	4%	23	13%
Refused	2	2%	0	0%	2	1%
Total	123	100%	55	100%	178	100%

Figure 3-10: Monthly Gas Bill

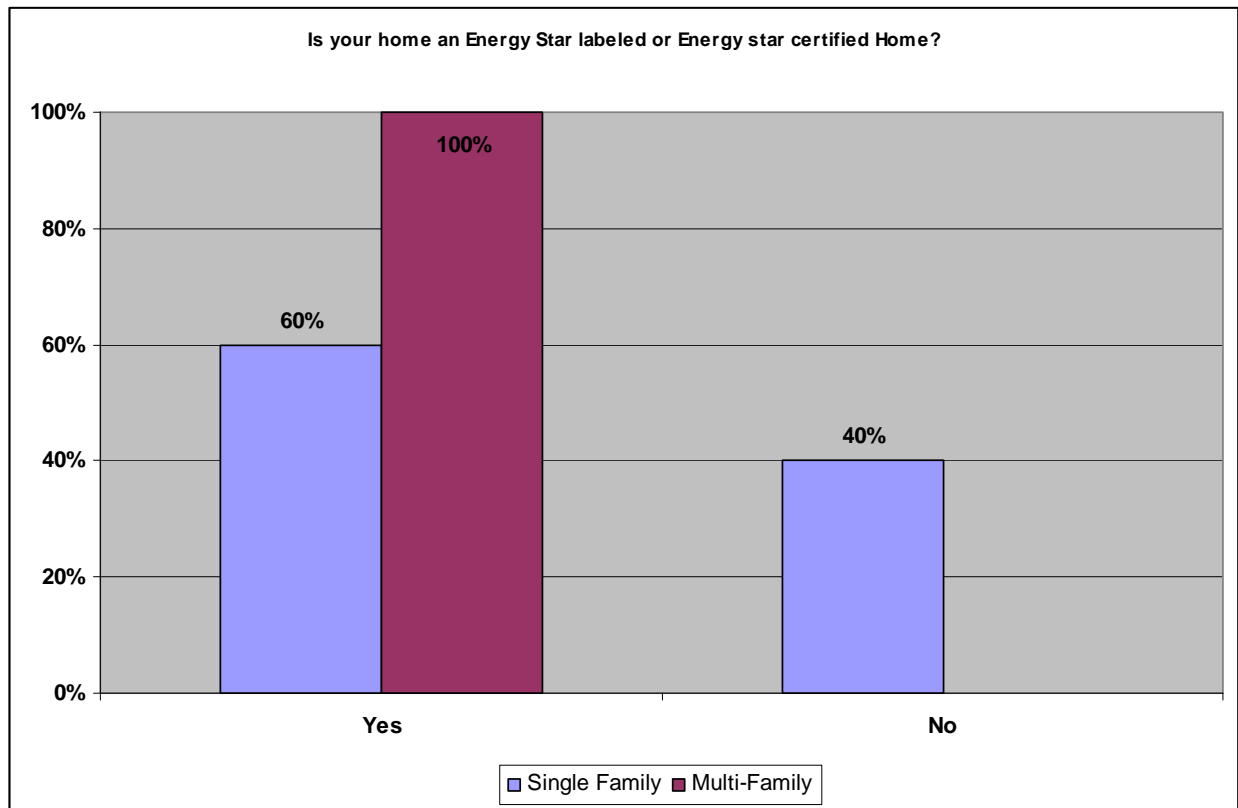


If a respondent indicated that they own their home and that it was constructed in 2004 or more recently, they were asked if their dwelling is an Energy Star labeled home. Out of the six homes in the sample constructed in 2004 or more recently, four of them are reported to be Energy Star labeled homes (67%).

Table 3-11: Energy Star Labeled/Certified Home

Is your home an Energy Star labeled or Energy star certified Home?	Single Family		Multi-Family		Total	
	N	%	N	%	N	%
Yes	3	60%	1	100%	4	67%
No	2	40%	0	0%	2	33%
Total	5	100%	1	100%	6	100%

Figure 3-11: Energy Star Labeled/Certified Home



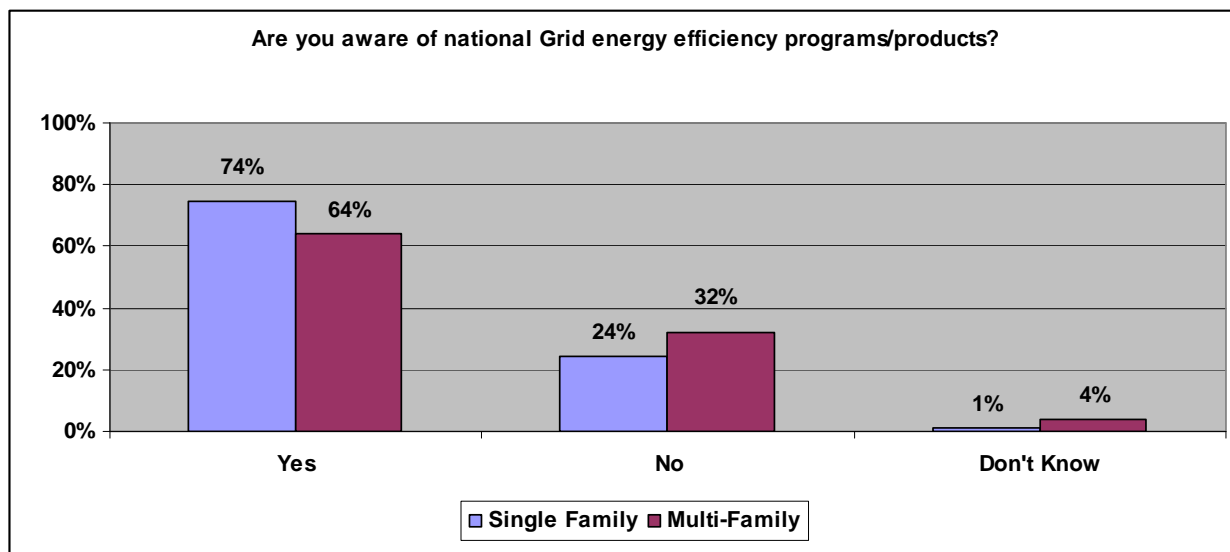
3.2 Program Awareness

The next section of the survey aimed to assess awareness of, and participation in, National Grid energy efficiency programs and products. First, respondents were asked if they are aware of National Grid energy efficiency programs or products that offer incentives or rebates. The majority of respondents, in both single family (74%) and multi-family residences (64%), report they are aware of National Grid energy efficiency programs or products.

Table 3-12: Program Awareness

Aware of National Grid Energy Efficiency Programs/Products?	Single Family		Multi-Family		Total	
	N	%	N	%	N	%
Yes	165	74%	50	64%	215	72%
No	54	24%	25	32%	79	26%
Don't Know	3	1%	3	4%	6	2%
Total	222	100%	78	100%	300	100%

Figure 3-12: Program Awareness

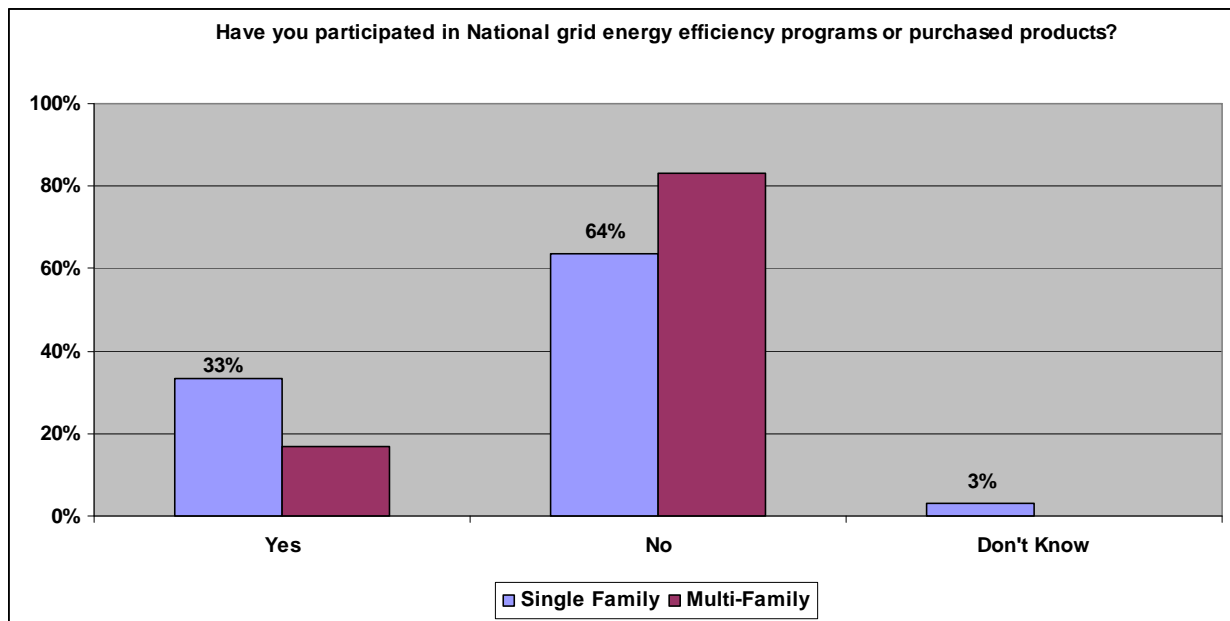


Next, those respondents who indicated some level of awareness of the National Grid energy efficiency programs (n=221) were asked if they had participated in any of the programs or purchased any of the promoted products while living in their current home. Despite significant awareness of National Grid energy efficiency programs, most participants (68%) did not participate in the energy efficiency programs.

Table 3-13: Program Participation

<i>While in your current home, have you participated in National Grid Energy Efficiency Programs/Products?</i>	<i>Single Family</i>		<i>Multi-Family</i>		<i>Total</i>	
	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>
Yes	56	33%	9	17%	65	29%
No	107	64%	44	83%	151	68%
Don't Know	5	3%	0	0%	5	2%
Total	168	100%	53	100%	221	100%

Figure 3-13: Program Participation



Of those respondents who participated in National Grid energy efficiency programs (n=65), the majority (86%) indicate they would participate in the program or purchase the promoted product again if they have the opportunity (see Table 3-14).

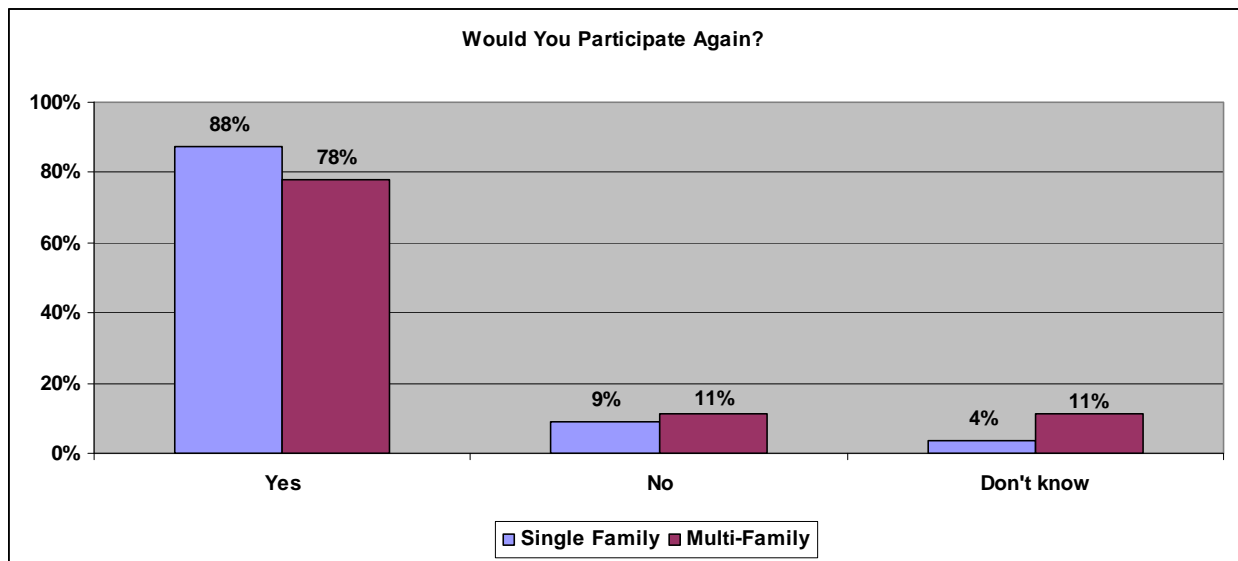
Six respondents indicate they would not participate again if they have the opportunity.

- Three respondents report they do not need to make any additional energy efficiency improvements
- One respondent felt that she/he was overcharged by the program
- One respondent indicated that she/he can't afford to participate in the program again

Table 3-14: Repeat Participation

<i>Would you participate again?</i>	<i>Single Family</i>		<i>Multi-Family</i>		<i>Total</i>	
	N	%	N	%	N	%
Yes	49	88%	7	78%	56	86%
No	5	9%	1	11%	6	9%
Don't Know	2	4%	1	11%	3	5%
Total	56	100%	9	100%	65	100%

Figure 3-14: Repeat Participation



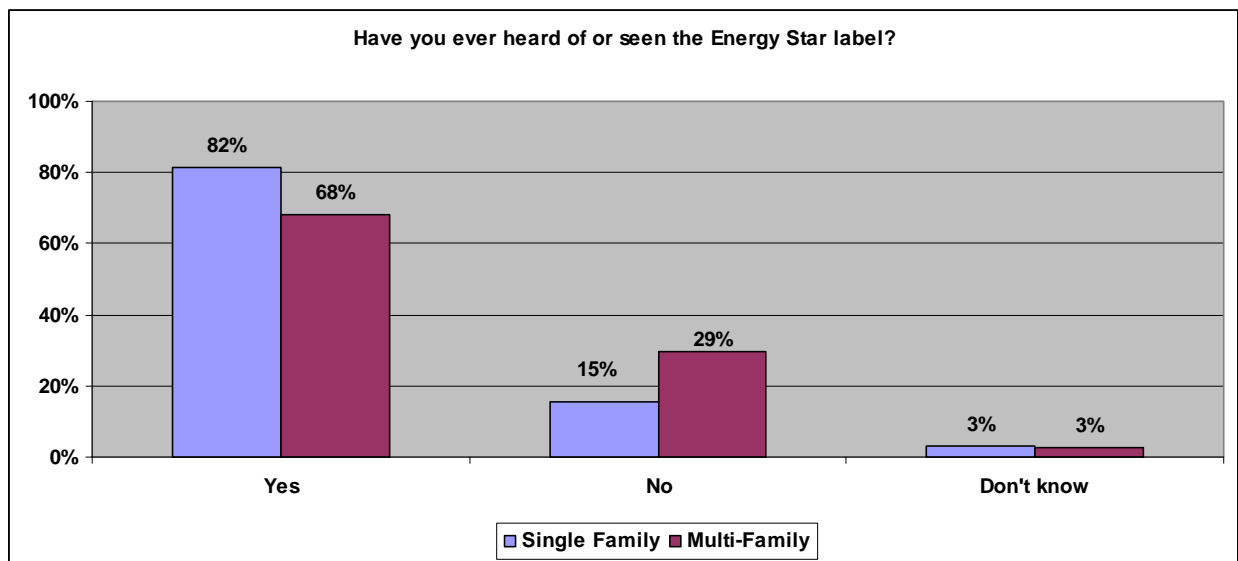
3.3 Energy Star Awareness

Next, respondents were asked about their awareness of the Energy Star label. The majority of respondents (78%) have heard of and/or seen the Energy Star label.

Table 3-15: Energy Star Awareness

Heard of or seen the Energy Star label?	Single Family		Multi-Family		Total	
	N	%	N	%	N	%
Yes	181	82%	53	68%	234	78%
No	34	15%	23	29%	57	19%
Don't Know	7	3%	2	3%	9	3%
Total	222	100%	78	100%	300	100%

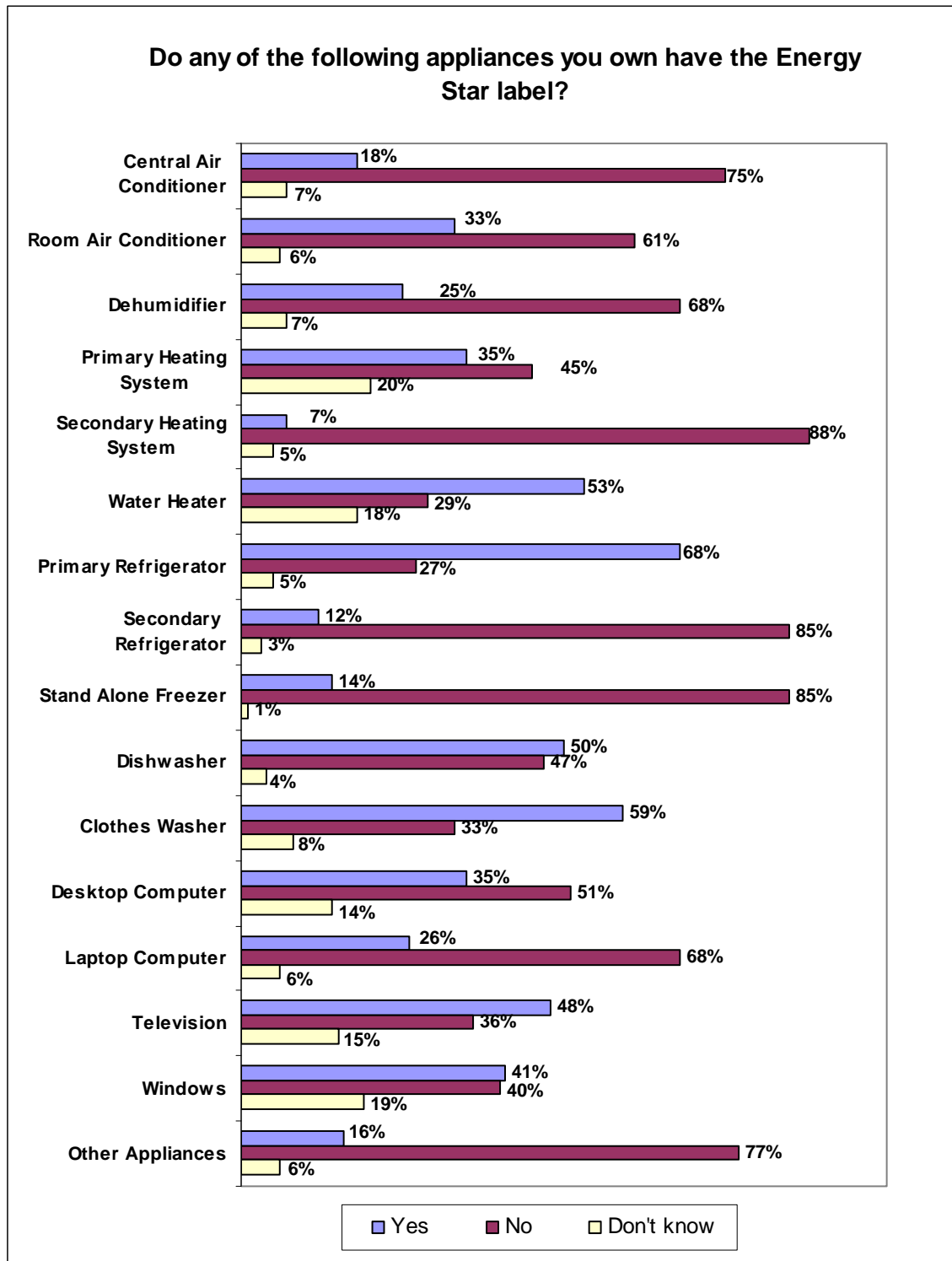
Figure 3-15: Energy Star Awareness



Respondents were also asked to indicate whether or not they owned appliances with the Energy Star label. If so, they were asked to indicate the number of each type of Energy Star appliance they owned. Figure 3-16 shows the percentage of respondents that own at least one of the identified Energy Star appliances.

It is interesting to note that stoves, ovens and microwaves were frequently reported as “other” Energy Star appliances owned by respondents. However, there is no Energy Star label for residential ovens, ranges, or microwave ovens at this time.

Figure 3-16: Energy Star Appliance Ownership

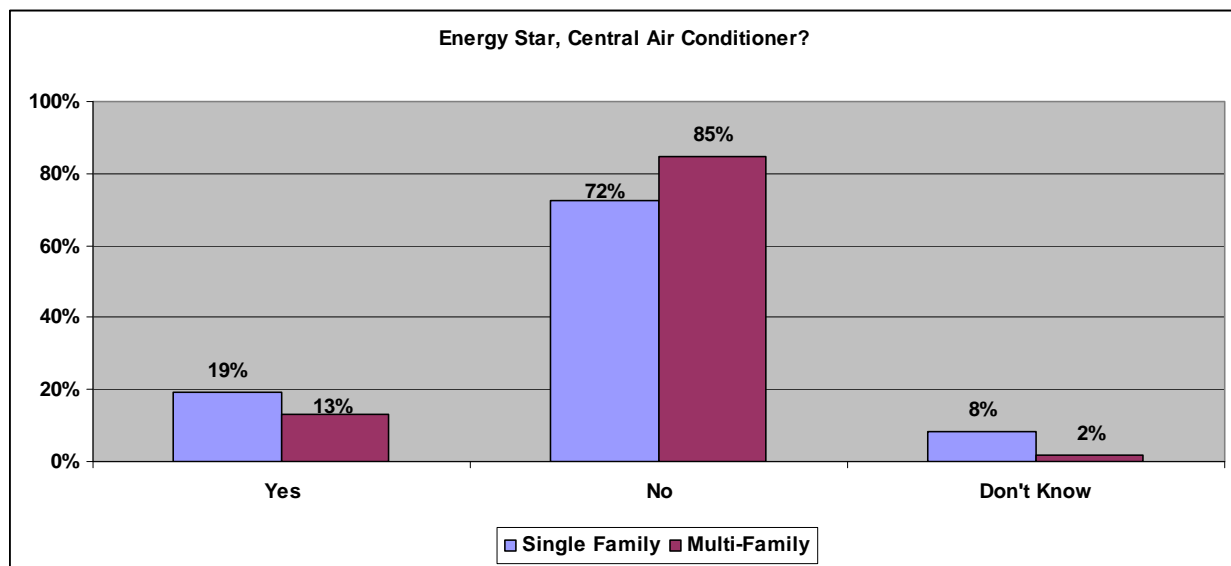


Less than a quarter of respondents who are aware of the Energy Star label (18%) indicate they own an Energy Star central air conditioner.

Table 3-16: Energy Star Central Air Conditioner Ownership

Energy Star Central Air Conditioner	Single Family		Multi-Family		Total	
	N	SF%	N	MF%	N	%
Yes	35	19%	7	13%	42	18%
No	131	72%	45	85%	176	75%
Don't Know	15	8%	1	2%	16	7%
Total	181	100%	53	100%	234	100%

Figure 3-17: Energy Star Central Air Conditioner Ownership

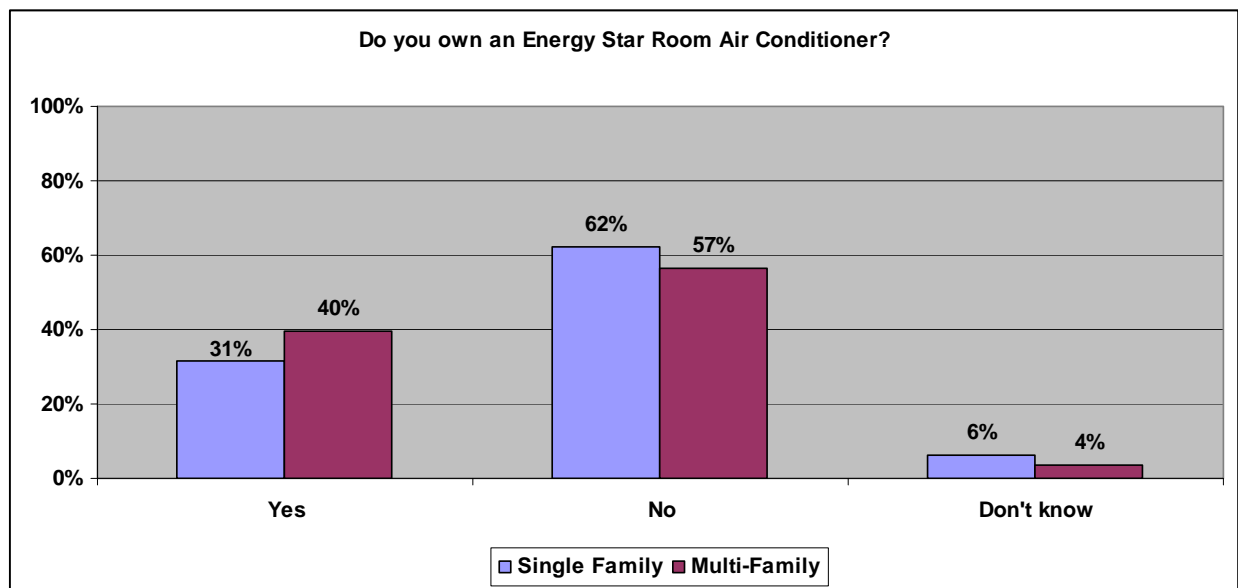


One-third of respondents who are aware of the Energy Star label indicate they own an energy efficient room air conditioner.

Table 3-17: Energy Star Room Air Conditioner Ownership

<i>Energy Star Room Air Conditioner</i>	<i>Single Family</i>		<i>Multi-Family</i>		<i>Total</i>	
	<i>N</i>	<i>SF%</i>	<i>N</i>	<i>MF%</i>	<i>N</i>	<i>%</i>
Yes	57	31%	21	40%	78	33%
No	113	62%	30	57%	143	61%
Don't know	11	6%	2	4%	13	6%
Total	181	100%	53	100%	234	100%

Figure 3-18: Energy Star Room Air Conditioner Ownership

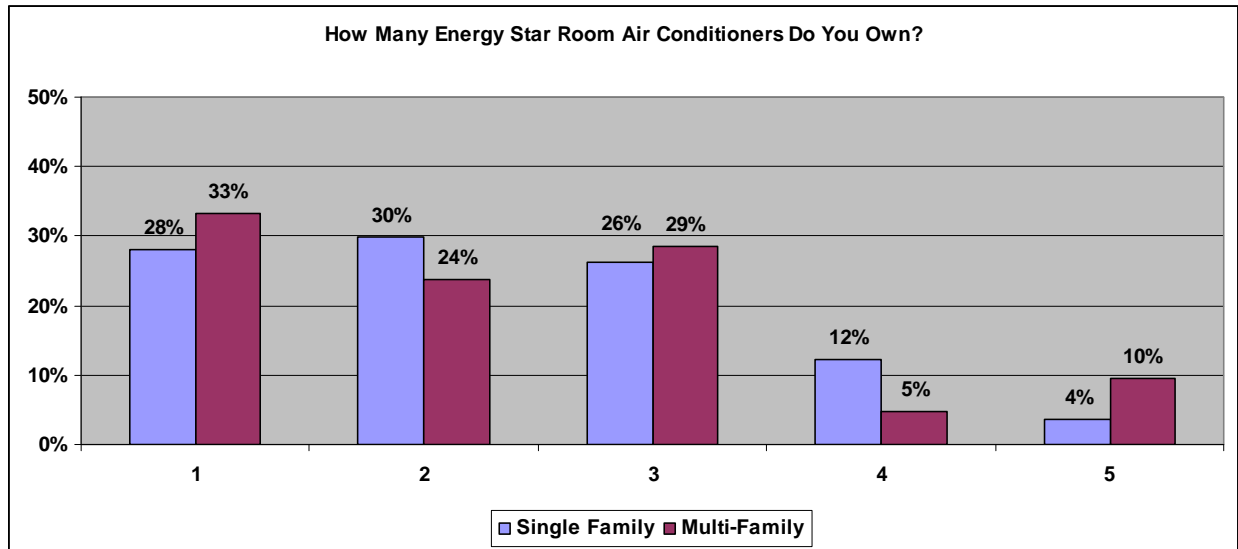


Few single or multi-family homes have more than three Energy Star room air conditioner units.

Table 3-18: Energy Star Room A/C Units per Home

<i>How many Room Air Conditioners?</i>	<i>Single Family</i>		<i>Multi-Family</i>		<i>Total</i>	
	<i>N</i>	<i>SF%</i>	<i>N</i>	<i>MF%</i>	<i>N</i>	<i>%</i>
1	16	28%	7	33%	23	29%
2	17	30%	5	24%	22	28%
3	15	26%	6	29%	21	27%
4	7	12%	1	5%	8	10%
5	2	4%	2	10%	4	6%
Total	57	100%	21	100%	78	100%

Figure 3-19: Energy Star Room A/C Units per Home

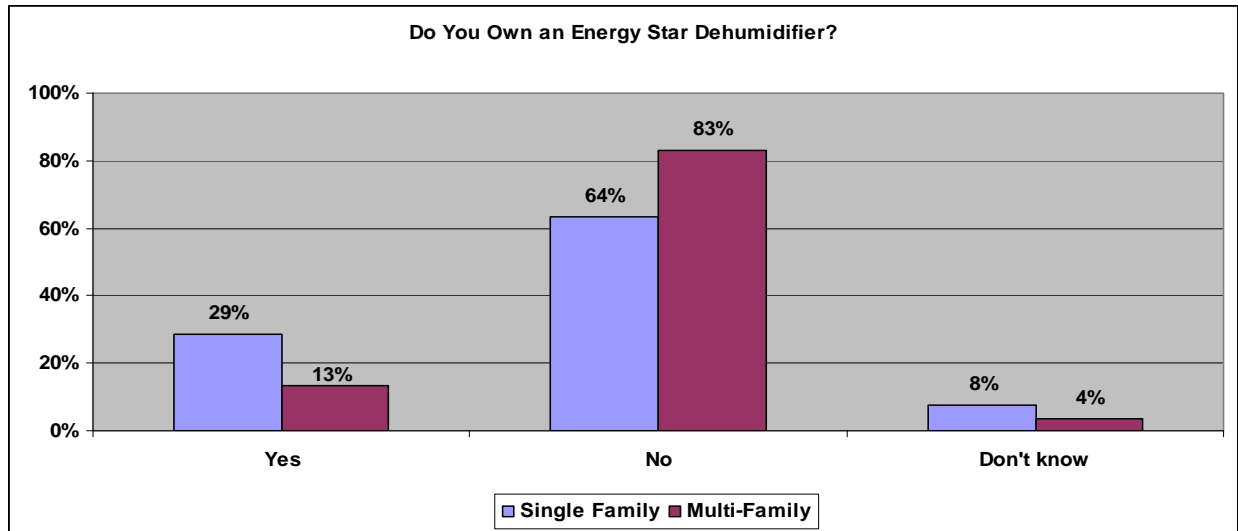


One quarter of all respondents who are aware of the Energy Star label report owning an energy efficient dehumidifier. However, ownership is more likely to occur in single family homes (29%) than multi-family homes (13%).

Table 3-19: Energy Star Dehumidifier Ownership

Do you own an Energy Star Dehumidifier?	Single Family		Multi-Family		Total	
	N	SF%	N	MF%	N	%
Yes	52	29%	7	13%	59	25%
No	115	64%	44	83%	159	68%
Don't know	14	8%	2	4%	16	7%
Total	181	100%	53	100%	234	100%

Figure 3-20: Energy Star Dehumidifier Ownership

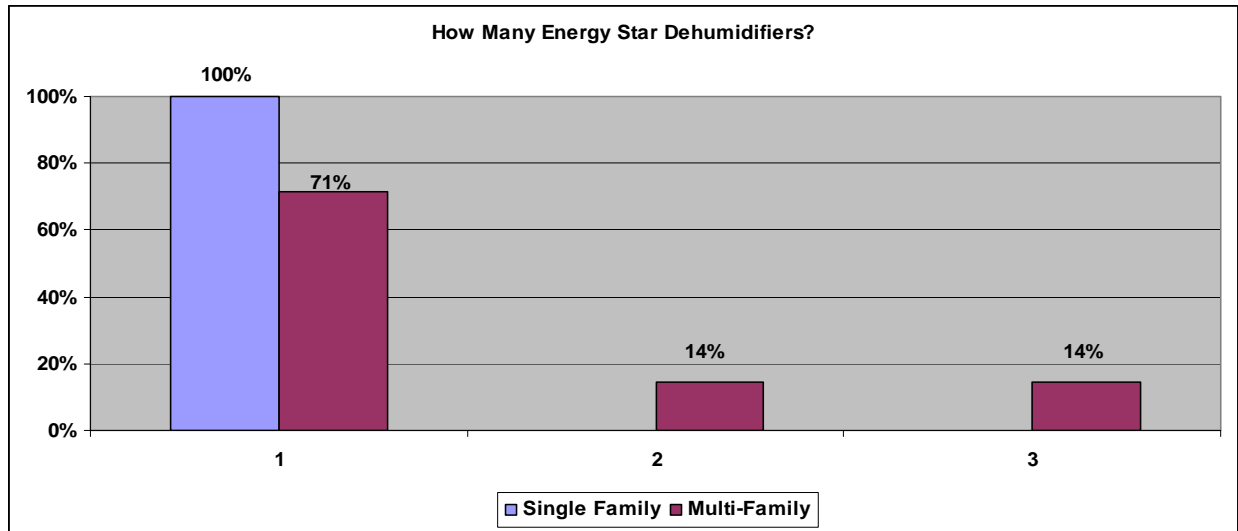


Nearly all respondents (97%) who own an Energy Star dehumidifier report having just one in their home.

Table 3-20: Energy Star Dehumidifiers per Home

How many Dehumidifiers?	Single Family		Multi-Family		Total	
	N	SF%	N	MF%	N	%
1	52	100%	5	71%	57	97%
2	0	0%	1	14%	1	2%
3	0	0%	1	14%	1	2%
Total	52	100%	7	100%	59	100%

Figure 3-21: Energy Star Dehumidifiers per Home

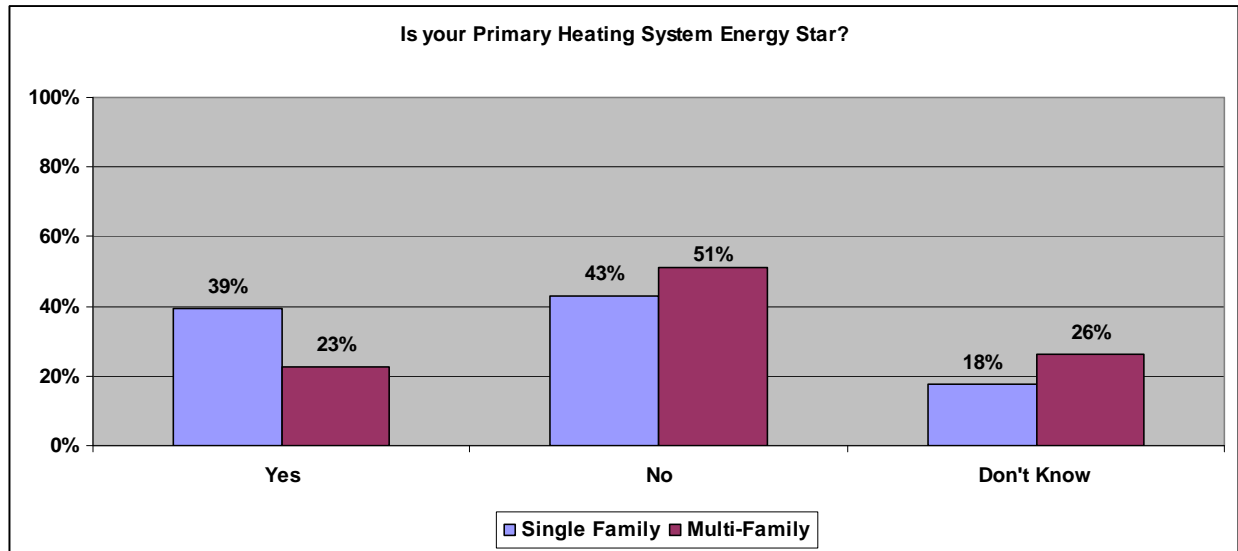


Over a third of all respondents (35%) who are aware of the Energy Star label report having an energy efficient primary heating system in their home. Single family homes report a higher rate of ownership of Energy Star primary heating systems (39%) than multi-family homes (23%).

Table 3-21: Energy Star Primary Heating System

Is your Primary Heating System Energy Star?	Single Family		Multi-Family		Total	
	N	SF%	N	MF%	N	%
Yes	71	39%	12	23%	83	35%
No	78	43%	27	51%	105	45%
Don't Know	32	18%	14	26%	46	20%
Total	181	100%	53	100%	234	100%

Figure 3-22: Energy Star Primary Heating System

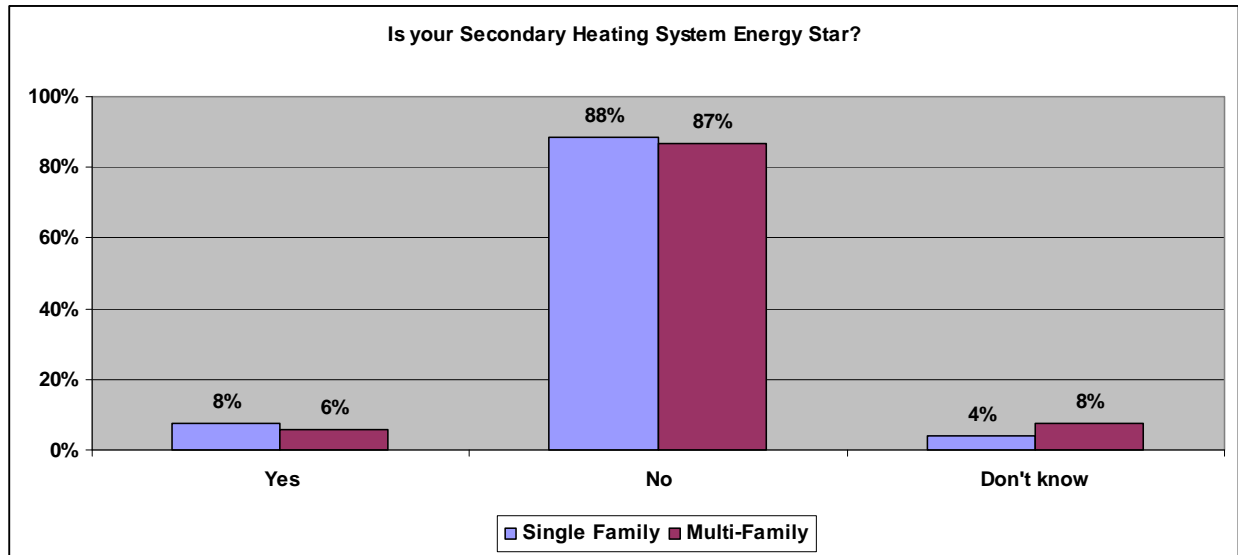


Respondents report few instances of ownership of Energy Star rated secondary heating systems.

Table 3-22: Energy Star Secondary Heating Systems

Energy Star Secondary Heating System?	Single Family		Multi-Family		Total	
	N	SF%	N	MF%	N	%
Yes	14	8%	3	6%	17	7%
No	160	88%	46	87%	206	88%
Don't know	7	4%	4	8%	11	5%
Total	181	100%	53	100%	234	100%

Figure 3-23: Energy Star Secondary Heating Systems

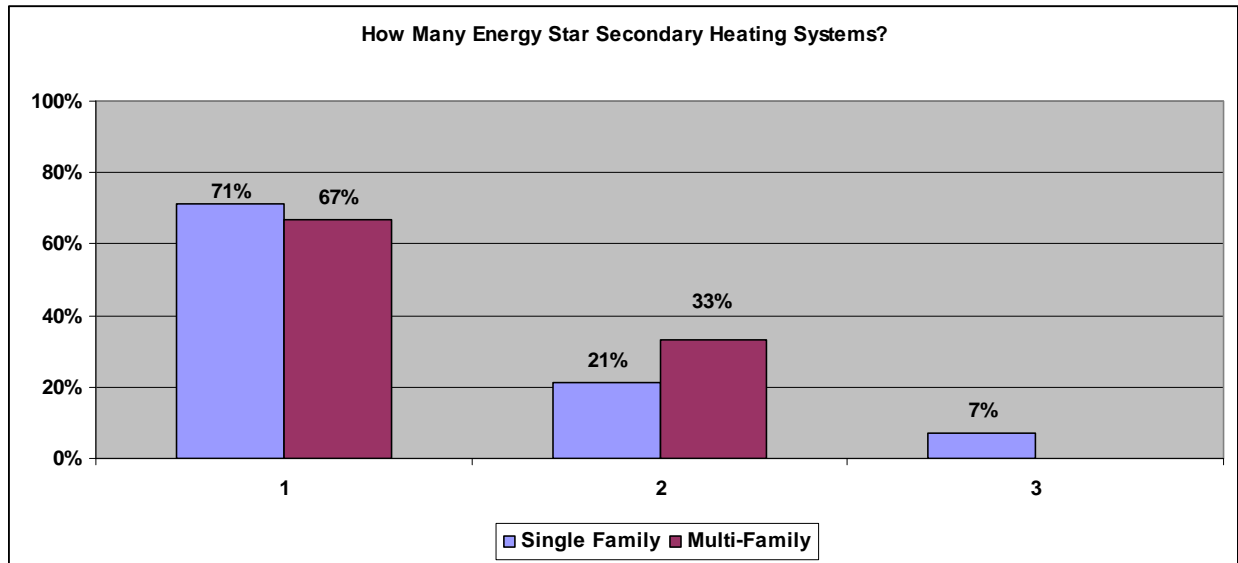


The majority of respondents who report owning an Energy Star secondary heating system indicate having just one energy efficient secondary heating system (71%).

Table 3-23: Energy Star Secondary Heating Systems per Home

How many Secondary Heating Systems?	Single Family		Multi-Family		Total	
	N	SF%	N	MF%	N	%
1	10	71%	2	67%	12	71%
2	3	21%	1	33%	4	24%
3	1	7%	0	0%	1	6%
Total	14	100%	3	100%	17	101%

Figure 3-24: Energy Star Secondary Heating Systems per Home

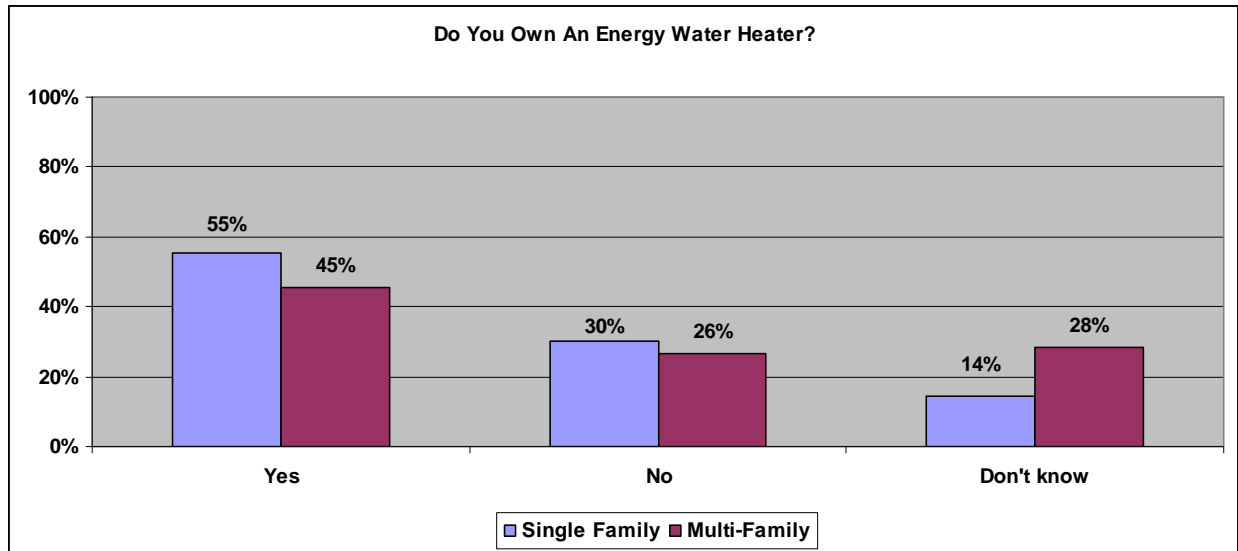


The majority of respondents (53%) who are aware of the Energy Star label report having an energy efficient water heater.

Table 3-24: Energy Star Water Heaters

<i>Energy Star Water Heater?</i>	<i>Single Family</i>		<i>Multi-Family</i>		<i>Total</i>	
	<i>N</i>	<i>SF%</i>	<i>N</i>	<i>MF%</i>	<i>N</i>	<i>%</i>
Yes	100	55%	24	45%	124	53%
No	55	30%	14	26%	69	29%
Don't know	26	14%	15	28%	41	18%
Total	181	100%	53	100%	234	100%

Figure 3-25: Energy Star Water Heaters

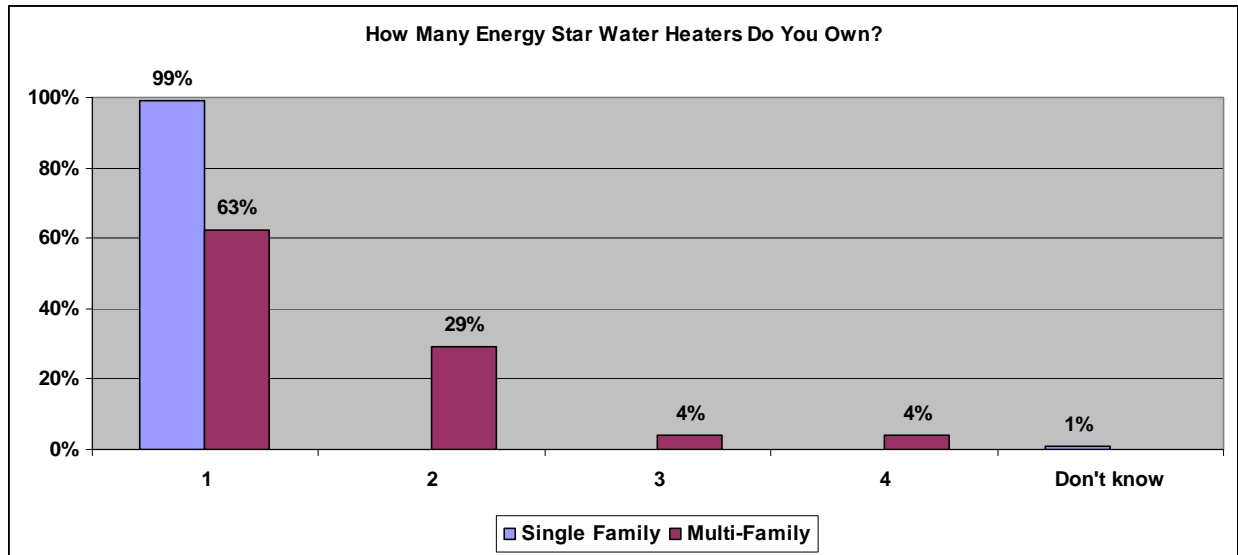


The number of Energy Star water heaters per home appears to depend upon the house type. Virtually all single family respondents (99%) report owning just one Energy Star label water heater. In contrast, 37% of multi-family respondents report owning two or more Energy Star water heaters.

Table 3-25: Energy Star Water Heaters per Home

How many Water Heaters?	Single Family		Multi-Family		Total	
	N	SF%	N	MF%	N	%
1	99	99%	15	63%	114	92%
2	0	0%	7	29%	7	6%
3	0	0%	1	4%	1	1%
4	0	0%	1	4%	1	1%
Don't know	1	1%	0	0%	1	1%
Total	100	100%	24	100%	124	100%

Figure 3-26: Energy Star Water Heaters per Home

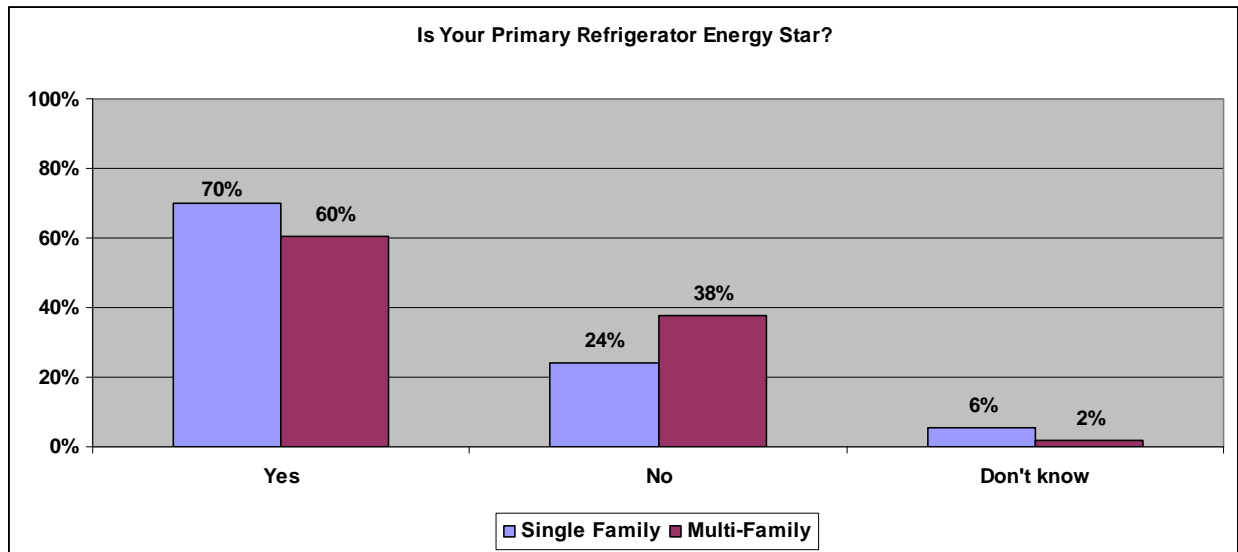


The majority of all respondents (68%) who are aware of the Energy Star label report having an energy efficient primary refrigerator.

Table 3-26: Energy Star Primary Refrigerator Ownership

Energy Star Primary Refrigerator?	Single Family		Multi-Family		Total	
	N	SF%	N	MF%	N	%
Yes	127	70%	32	60%	159	68%
No	44	24%	20	38%	64	27%
Don't know	10	6%	1	2%	11	5%
Total	181	100%	53	100%	234	100%

Figure 3-27: Energy Star Primary Refrigerator Ownership

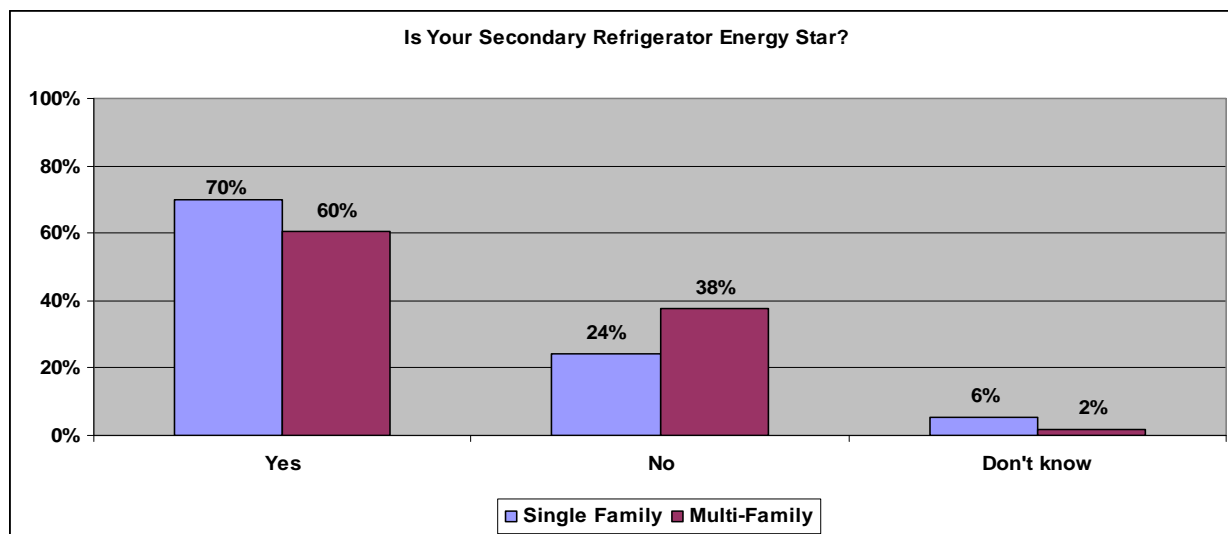


The majority of respondents (85%) who are aware of the Energy Star label report that their secondary refrigerator is not Energy Star rated.

Table 3-27: Energy Star Secondary Refrigerator

Secondary Refrigerator(s)	Single Family		Multi-Family		Total	
	N	SF%	N	MF%	N	%
Yes	19	10%	8	15%	27	12%
No	154	85%	45	85%	199	85%
Don't know	8	4%	0	0%	8	3%
Total	181	100%	53	100%	234	100%

Figure 3-28: Energy Star Secondary Refrigerator

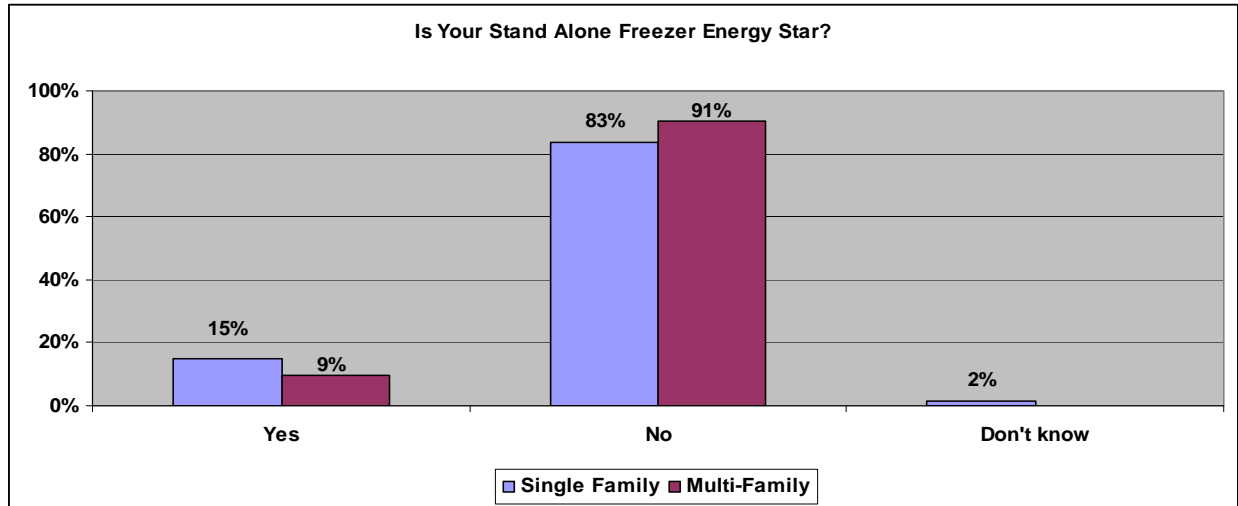


Most respondents (85%) who are aware of the Energy Star label report their stand alone freezer is not Energy Star rated.

Table 3-28: Energy Star Stand Alone Freezer

Stand alone freezer	Single Family		Multi-Family		Total	
	N	SF%	N	MF%	N	%
Yes	27	15%	5	9%	32	14%
No	151	83%	48	91%	199	85%
Don't know	3	2%	0	0%	3	1%
Total	181	100%	53	100%	234	100%

Figure 3-29: Energy Star Stand Alone Freezer

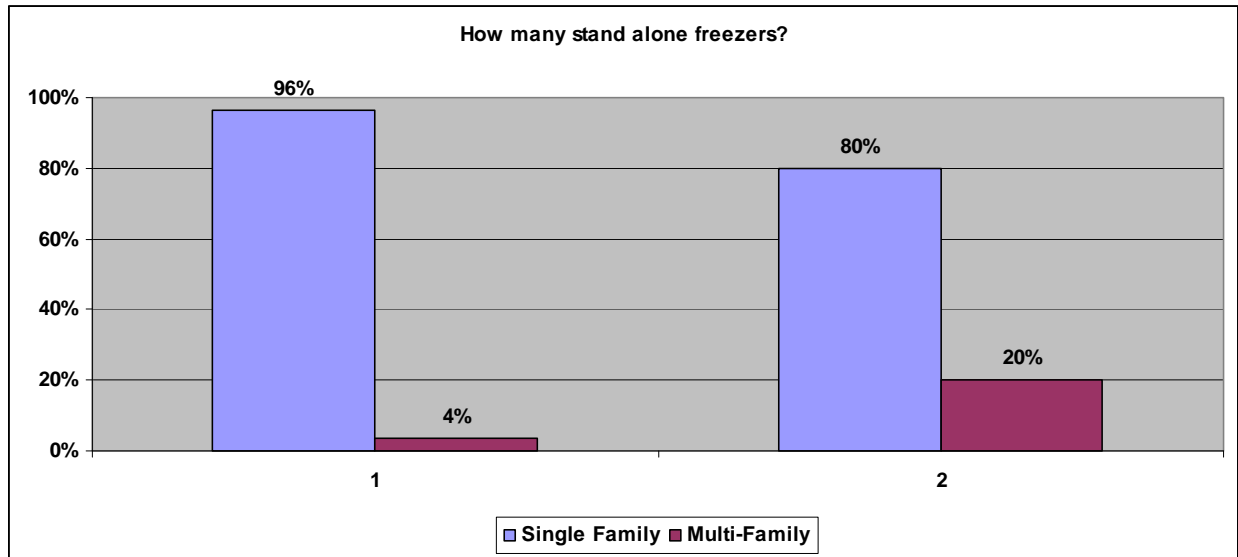


Few respondents (6%) report having more than one stand alone Energy Star freezer.

Table 3-29: Energy Star Stand Alone Freezers per Home

How many stand alone freezers?	Single Family		Multi-Family		Total	
	N	SF%	N	MF%	N	%
1	26	96%	4	80%	30	94%
2	1	4%	1	20%	2	6%
Total	27	100%	5	100%	32	100%

Figure 3-30: Energy Star Stand Alone Freezers per Home

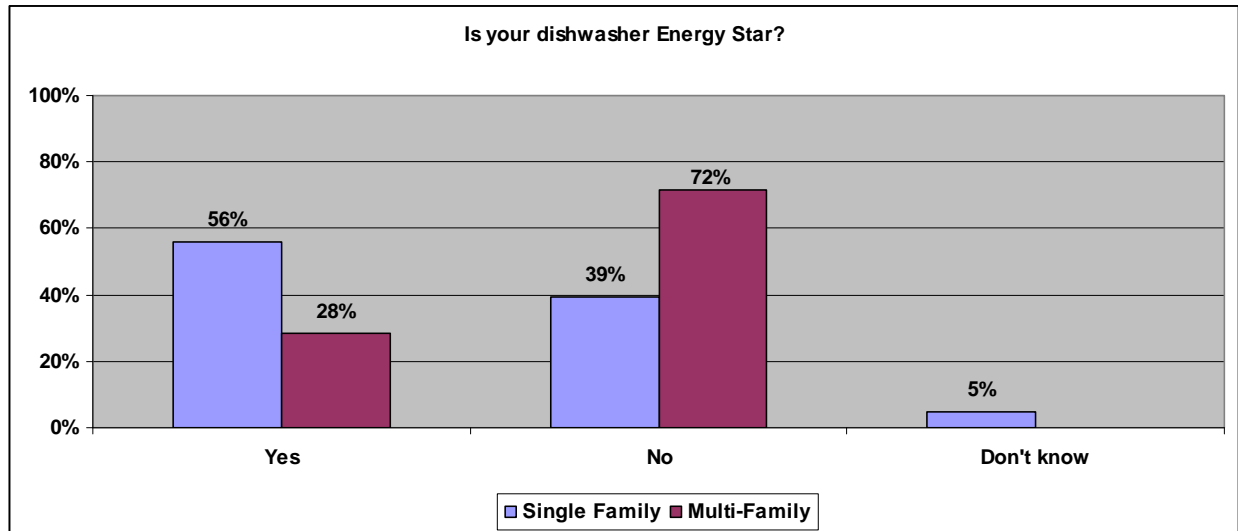


The ownership rate of Energy Star dishwashers appears to occur predominantly in single family homes. Over half of single family respondents (56%) who are aware of the Energy Star label report owning an energy efficient dishwasher compared to less than a third of multi-family respondents (28%).

Table 3-30: Energy Star Dishwashers

<i>Dishwasher</i>	<i>Single Family</i>		<i>Multi-Family</i>		<i>Total</i>	
	<i>N</i>	<i>SF%</i>	<i>N</i>	<i>MF%</i>	<i>N</i>	<i>%</i>
Yes	101	56%	15	28%	116	50%
No	71	39%	38	72%	109	46%
Don't know	9	5%	0	0%	9	4%
Total	181	100%	53	100%	234	100%

Figure 3-31: Energy Star Dishwashers

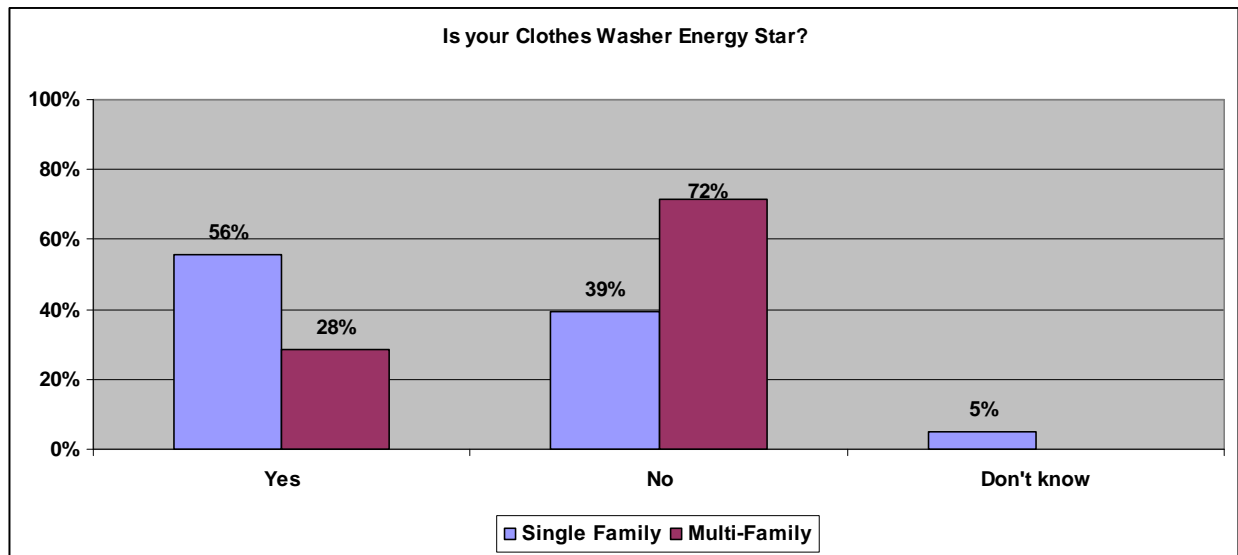


The majority of respondents (59%) who are aware of the Energy Star label report they own an energy efficient clothes washer. Similar to dishwashers, single family homes report a higher rate of ownership (63%) for Energy Star clothes washers in comparison to multi-family homes (45%).

Table 3-31: Energy Star Clothes Washer

<i>Clothes Washer</i>	<i>Single Family</i>		<i>Multi-Family</i>		<i>Total</i>	
	<i>N</i>	<i>SF%</i>	<i>N</i>	<i>MF%</i>	<i>N</i>	<i>%</i>
Yes	114	63%	24	45%	138	59%
No	49	27%	28	53%	77	33%
Don't know	18	10%	1	2%	19	8%
Total	181	100%	53	100%	234	100%

Figure 3-32: Energy Star Clothes Washer

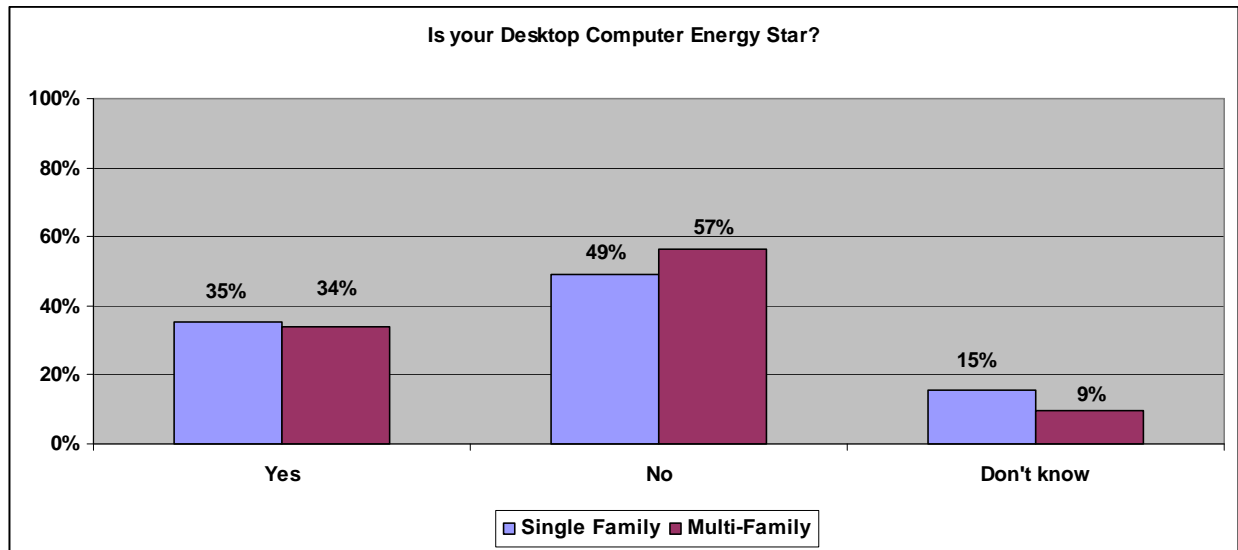


Slightly over a third of respondents (35%) who are aware of the Energy Star label report they own an energy efficient desktop computer. The percentage of Energy Star ownership appears to be relatively similar for single and multi-family homes.

Table 3-32: Energy Star Desktop Computer

<i>Desktop Computer</i>	<i>Single Family</i>		<i>Multi-Family</i>		<i>Total</i>	
	<i>N</i>	<i>SF%</i>	<i>N</i>	<i>MF%</i>	<i>N</i>	<i>%</i>
Yes	64	35%	18	34%	82	35%
No	89	49%	30	57%	119	51%
Don't know	28	15%	5	9%	33	14%
Total	181	100%	53	100%	234	100%

Figure 3-33: Energy Star Desktop Computer

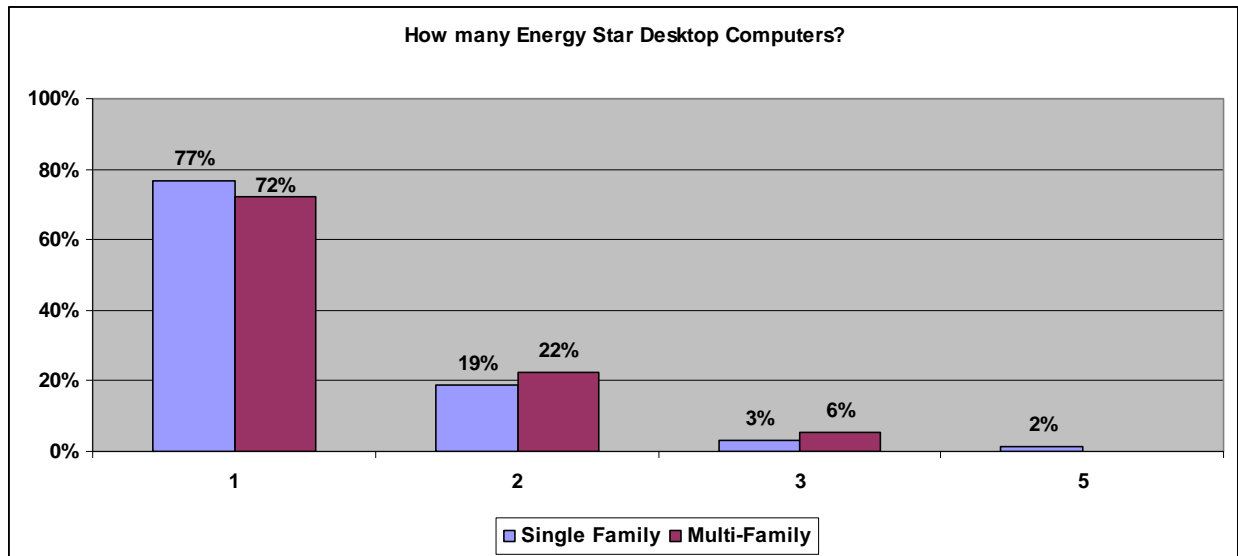


Nearly a quarter of residents (24%) who are aware of the Energy Star label report owning two or more Energy Star desktop computers.

Table 3-33: Energy Star Desktop Computers per Home

How many Desktop Computers?	Single Family		Multi-Family		Total	
	N	SF%	N	MF%	N	%
1	49	77%	13	72%	62	76%
2	12	19%	4	22%	16	19%
3	2	3%	1	6%	3	4%
5	1	2%	0	0%	1	1%
Total	64	100%	18	100%	82	100%

Figure 3-34: Number of Energy Star Desktop Computers

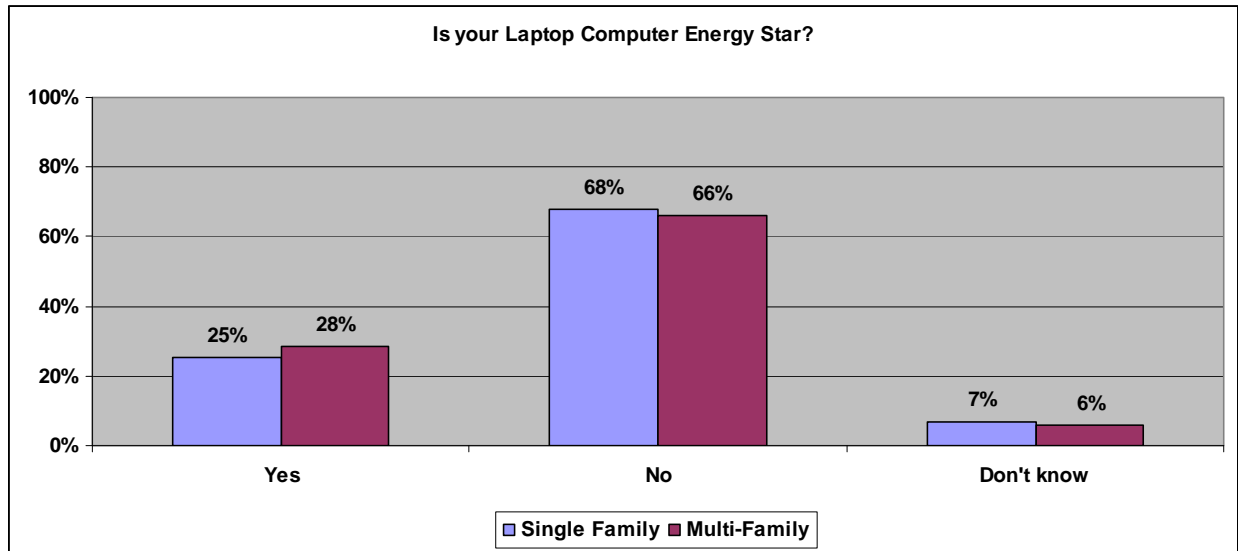


In regards to Energy Star laptops, slightly over a fourth of all respondents (26%) who are aware of the Energy Star label report they own this type of appliance.

Table 3-34: Energy Star Laptop Computer Ownership

<i>Laptop Computer</i>	<i>Single Family</i>		<i>Multi-Family</i>		<i>Total</i>	
	<i>N</i>	<i>SF%</i>	<i>N</i>	<i>MF%</i>	<i>N</i>	<i>%</i>
Yes	46	25%	15	28%	61	26%
No	123	68%	35	66%	158	68%
Don't know	12	7%	3	6%	15	6%
Total	181	100%	53	100%	234	100%

Figure 3-35: Energy Star Laptop Computer Ownership

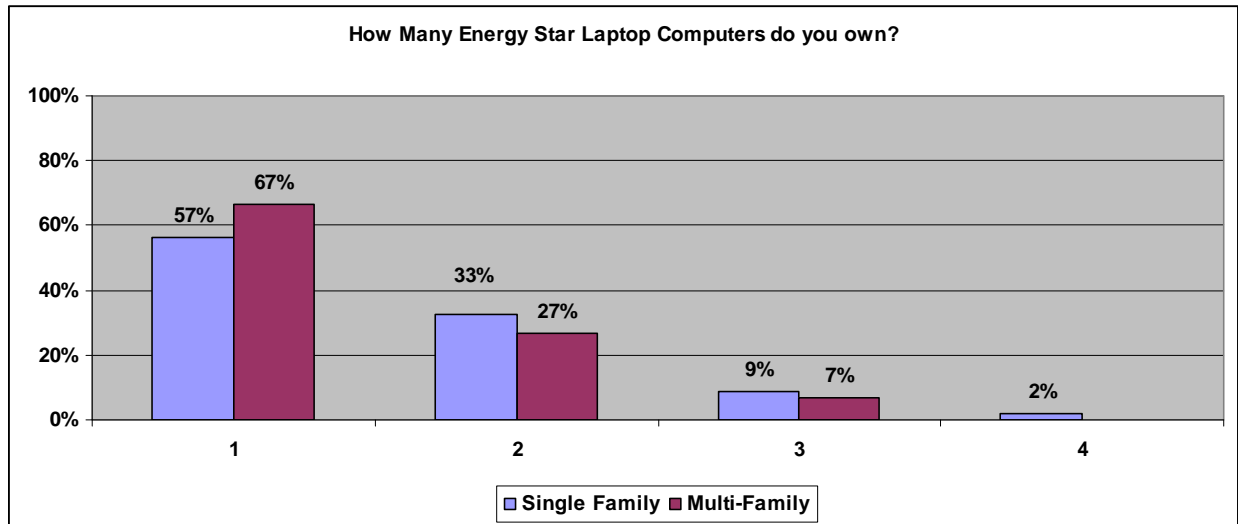


Nearly a half of residents (41%) who are aware of the Energy Star label report owning two or more Energy Star laptop computers.

Table 3-35: Energy Star Laptops per Home

How many Laptop Computers?	Single Family		Multi-Family		Total	
	N	SF%	N	MF%	N	%
1	26	57%	10	67%	36	59%
2	15	33%	4	27%	19	31%
3	4	9%	1	7%	5	8%
4	1	2%	0	0%	1	2%
Total	46	100%	15	100%	61	100%

Figure 3-36: Energy Star Laptops per Home

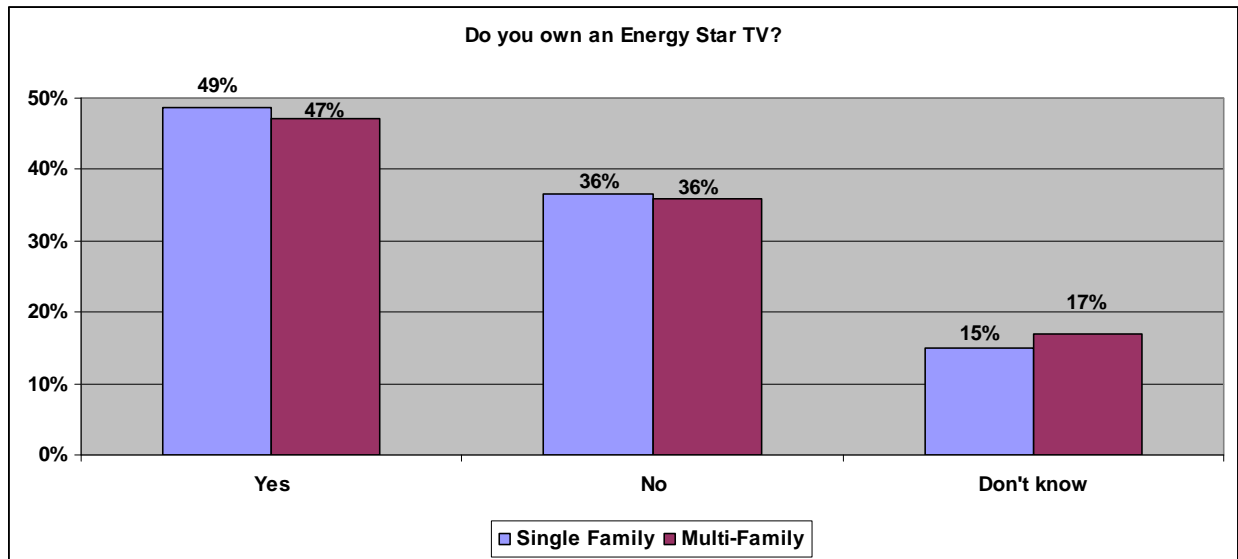


Nearly half of all respondents (48%) who are aware of the Energy Star label report they own an energy efficient television.

Table 3-36: Energy Star Television Ownership

<i>Television</i>	<i>Single Family</i>		<i>Multi-Family</i>		<i>Total</i>	
	<i>N</i>	<i>SF%</i>	<i>N</i>	<i>MF%</i>	<i>N</i>	<i>%</i>
Yes	88	49%	25	47%	113	48%
No	66	36%	19	36%	85	36%
Don't know	27	15%	9	17%	36	16%
Total	181	100%	53	100%	234	100%

Figure 3-37: Energy Star Television Ownership

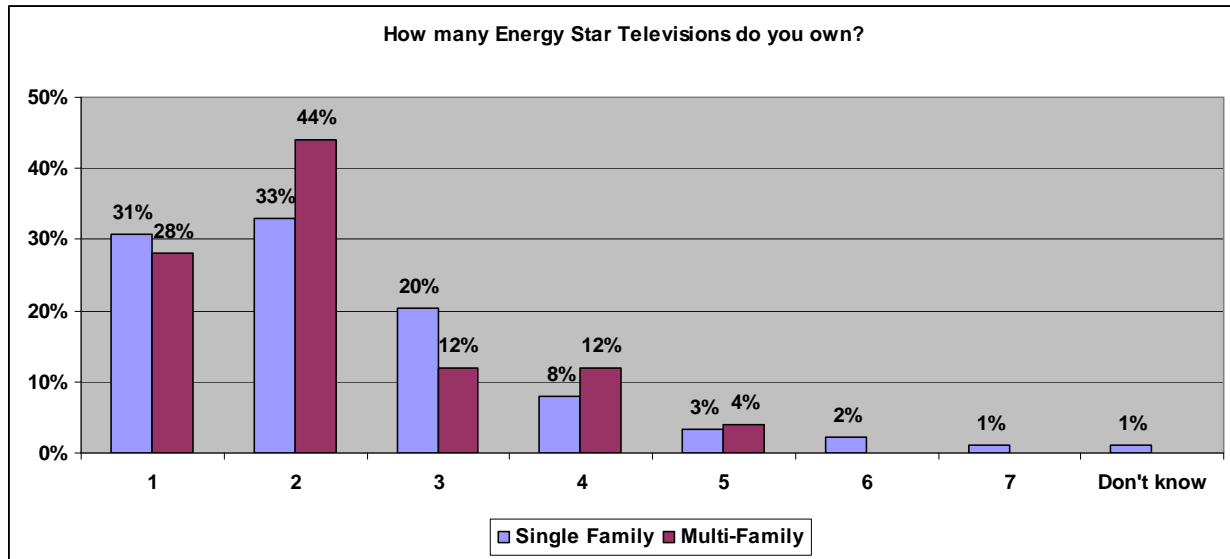


In terms of the number of Energy Star TVs per home, 84% of respondents who are aware of the Energy Star label indicate owning one to three of these televisions.

Table 3-37: Number of Energy Star Televisions per Home

How many Televisions?	Single Family		Multi-Family		Total	
	N	SF%	N	MF%	N	%
1	27	31%	7	28%	34	30%
2	29	33%	11	44%	40	35%
3	18	20%	3	12%	21	19%
4	7	8%	3	12%	10	9%
5	3	3%	1	4%	4	4%
6	2	2%	0	0%	2	2%
7	1	1%	0	0%	1	1%
Don't know	1	1%	0	0%	1	1%
Total	88	100%	25	100%	113	100%

Figure 3-38: Number of Energy Star Televisions per Home

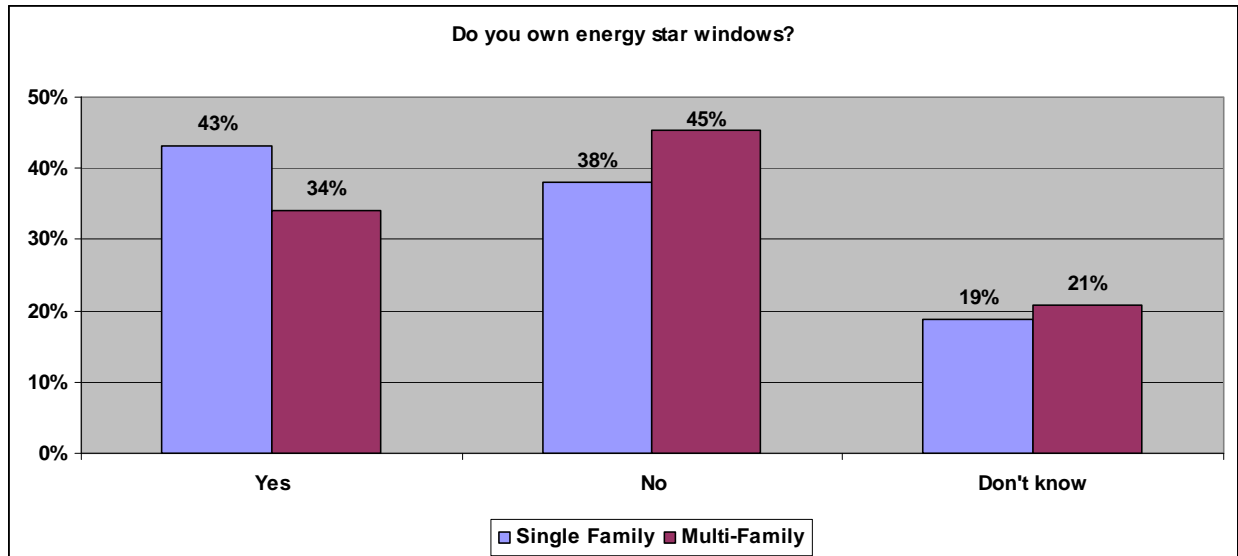


Nearly the same percentage of respondents indicate owning Energy Star windows (41%) as those who do not (40%). The potential to upgrade the windows of approximately half the population to Energy Star standards represents a significant energy efficiency and savings opportunity.

Table 3-38: Energy Star Windows

<i>Windows</i>	<i>Single Family</i>		<i>Multi-Family</i>		<i>Total</i>	
	<i>N</i>	<i>SF%</i>	<i>N</i>	<i>MF%</i>	<i>N</i>	<i>%</i>
Yes	78	43%	18	34%	96	41%
No	69	38%	24	45%	93	40%
Don't know	34	19%	11	21%	45	19%
Total	181	100%	53	100%	234	100%

Figure 3-39: Energy Star Windows

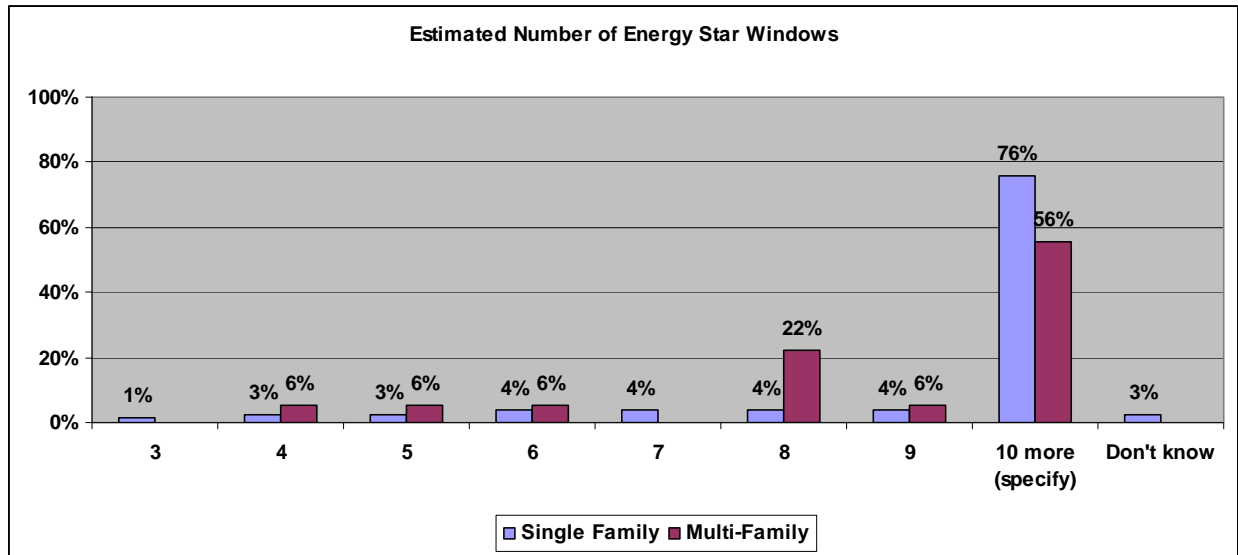


The number of Energy Star windows in a home makes a difference in capturing the full energy savings potential. It is an encouraging sign that survey results show over three quarters of single family homes (76%) and over half of multi-family homes (56%) have ten or more Energy Star windows.

Table 3-39: Number of Energy Star Windows

How many Windows? (Estimate is fine)	Single Family		Multi-Family		Total	
	N	SF%	N	MF%	N	%
3	1	1%	0	0%	1	1%
4	2	3%	1	6%	3	3%
5	2	3%	1	6%	3	3%
6	3	4%	1	6%	4	4%
7	3	4%	0	0%	3	3%
8	3	4%	4	22%	7	7%
9	3	4%	1	6%	4	4%
10 or more	59	76%	10	56%	69	72%
Don't know	2	3%	0	0%	2	3
Total	78	100%	18	100%	96	100%

Figure 3-40: Number of Energy Star Windows



3.4 Weatherization and Building Envelope

Respondents were asked whether their home's exterior walls, floor, and attic or ceiling were insulated. In virtually all categories, respondents living in single family homes indicate more home insulation than multi-family residences.

Single family homes report exterior insulation in all walls at a rate of 77% compared to multi-family homes which report a rate of 53%. This pattern is repeated with attic/ceiling insulation where 91% of single-family homes report insulation compared to 58% of multi-family homes.

Results are presented in Tables 3-40 through 3-43, according to residence type.

Table 3-40: Exterior Wall Insulation

<i>Are your home's exterior walls insulated?</i>	<i>Single Family</i>		<i>Multi-Family</i>		<i>Total</i>	
	<i>N</i>	<i>SF%</i>	<i>N</i>	<i>MF%</i>	<i>N</i>	<i>%</i>
Yes, all walls	172	77%	41	53%	213	71%
Yes, some walls	22	10%	13	17%	35	12%
No	13	6%	12	15%	25	8%
Don't know	15	7%	12	15%	27	9%
Total	222	100%	78	100%	300	100%

Figure 3-41: Exterior Wall Insulation

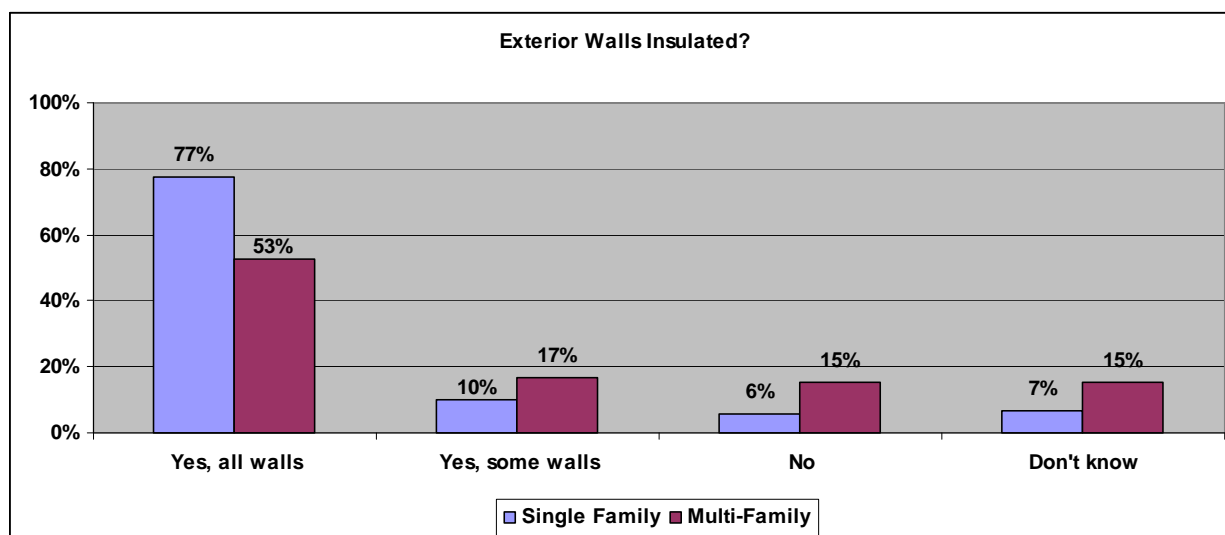


Table 3-41: Floor Insulation

<i>Are your floors in your home insulated?</i>	<i>Single Family</i>		<i>Multi-Family</i>		<i>Total</i>	
	<i>N</i>	<i>SF%</i>	<i>N</i>	<i>MF%</i>	<i>N</i>	<i>%</i>
Yes	87	39%	25	32%	112	37%
No	108	49%	28	36%	136	45%
Don't know	27	12%	25	32%	52	17%
Total	222	100%	78	100%	300	100%

Figure 3-42: Floor Insulation

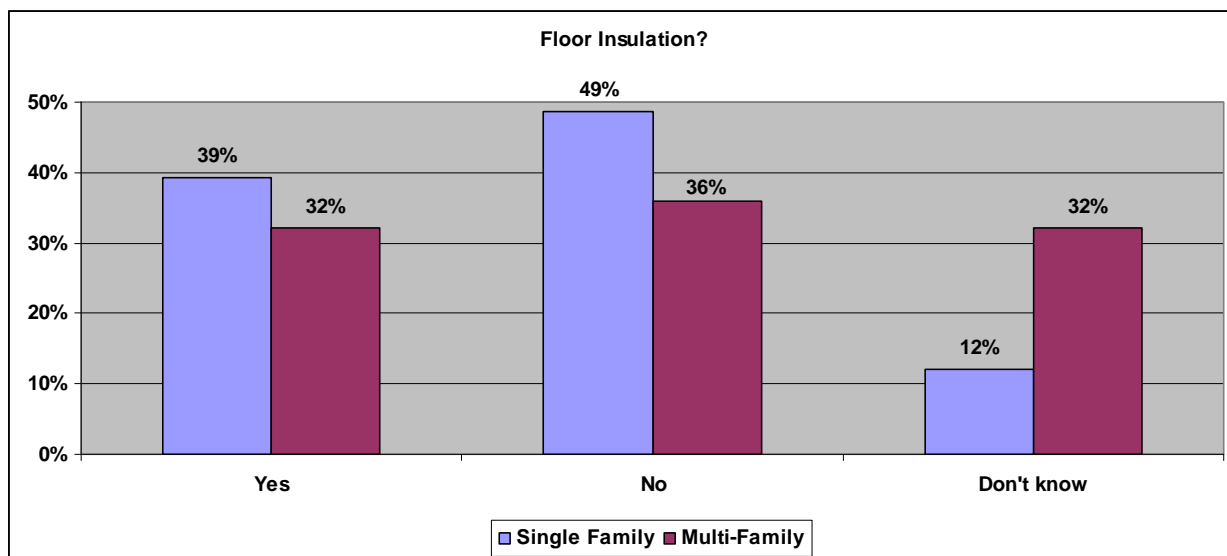
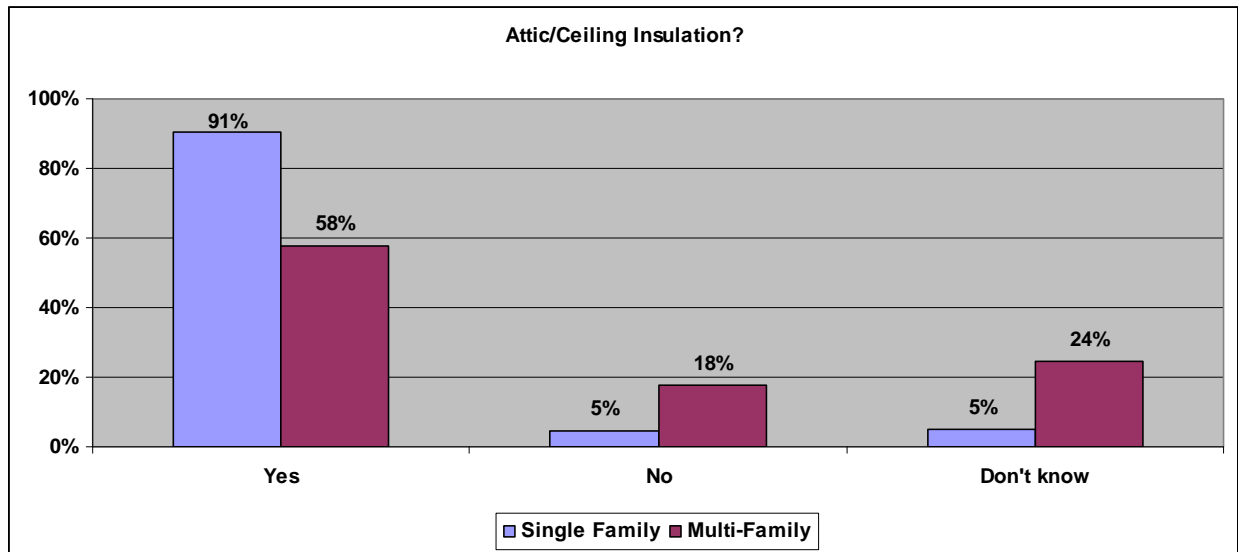


Table 3-42: Attic/Ceiling Insulation

Is your home s attic/ceiling insulated?	Single Family		Multi-Family		Total	
	N	SF%	N	MF%	N	%
Yes	201	91%	45	58%	246	82%
No	10	5%	14	18%	24	8%
Don't know	11	5%	19	24%	30	10%
Total	222	100%	78	100%	300	100%

Figure 3-43: Attic/Ceiling Insulation

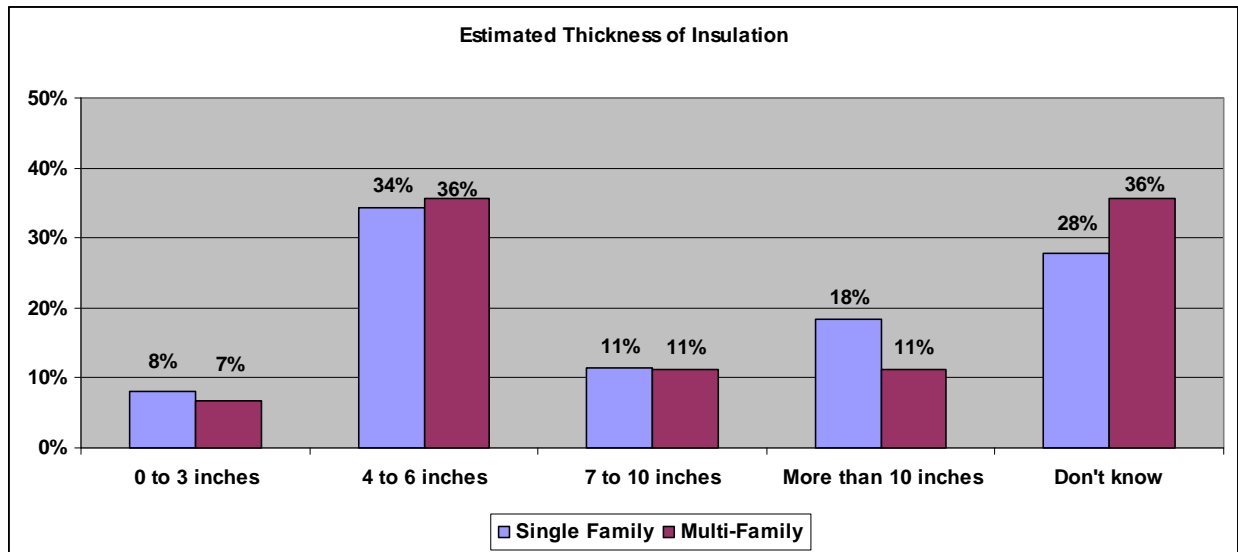


Respondents with attic or ceiling insulation were asked to estimate the number of inches of insulation present. The most common response (35%) was 4-6 inches of attic/ceiling insulation. Almost a third of residents (29%) did not know an estimate of the amount of insulation.

Table 3-43: Attic/Ceiling Insulation Thickness

<i>Inches of attic/ceiling insulation?</i>	<i>Single Family</i>		<i>Multi-Family</i>		<i>Total</i>	
	N	%	N	%	N	%
0 to 3 inches	16	8%	3	7%	19	8%
4 to 6 inches	69	34%	16	36%	85	35%
7 to 10 inches	23	11%	5	11%	28	11%
More than 10 inches	37	18%	5	11%	42	17%
Don't know	56	28%	16	36%	72	29%
Total	201	100%	45	100%	246	100%

Figure 3-44: Attic/Ceiling Insulation Thickness

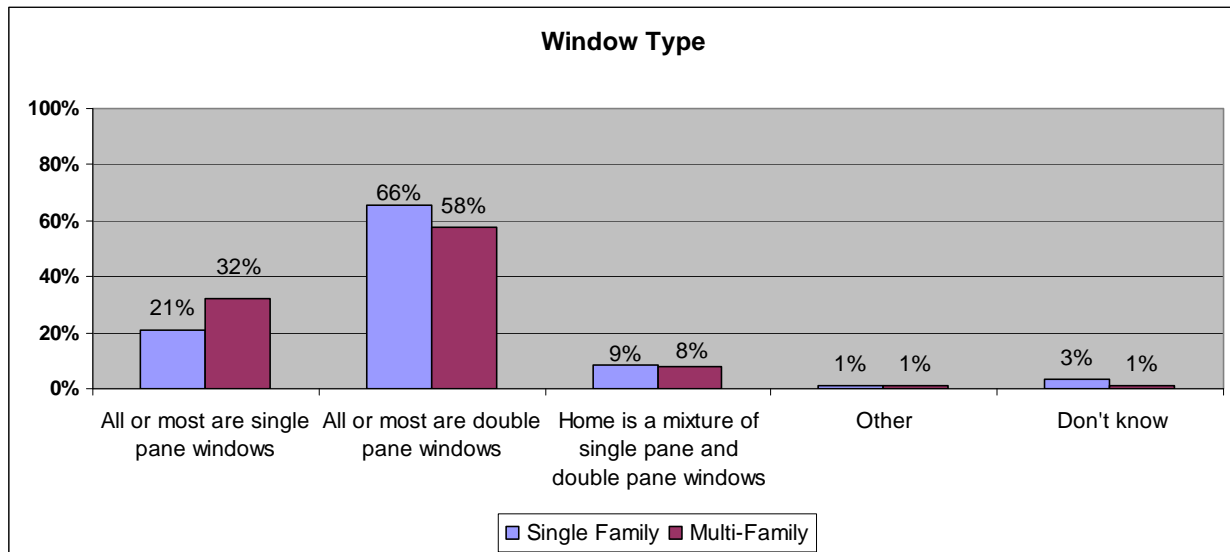


Next, respondents were asked to describe their home's windows. Most customers (64%) report having all or mostly double pane windows in their homes.

Table 3-44: Window Type

<i>Choose the statement that best describes your windows.</i>	<i>Single Family</i>		<i>Multi-Family</i>		<i>Total</i>	
	<i>N</i>	<i>SF%</i>	<i>N</i>	<i>MF%</i>	<i>N</i>	<i>%</i>
All or most are single pane windows	47	21%	25	32%	72	24%
All or most are double pane windows	146	66%	45	58%	191	64%
Home is a mixture of single pane and double pane windows	19	9%	6	8%	25	8%
Other	3	1%	1	1%	4	1%
Don't know	7	3%	1	1%	8	3%
Total	222	100%	78	100%	300	100%

Figure 3-45: Window Type

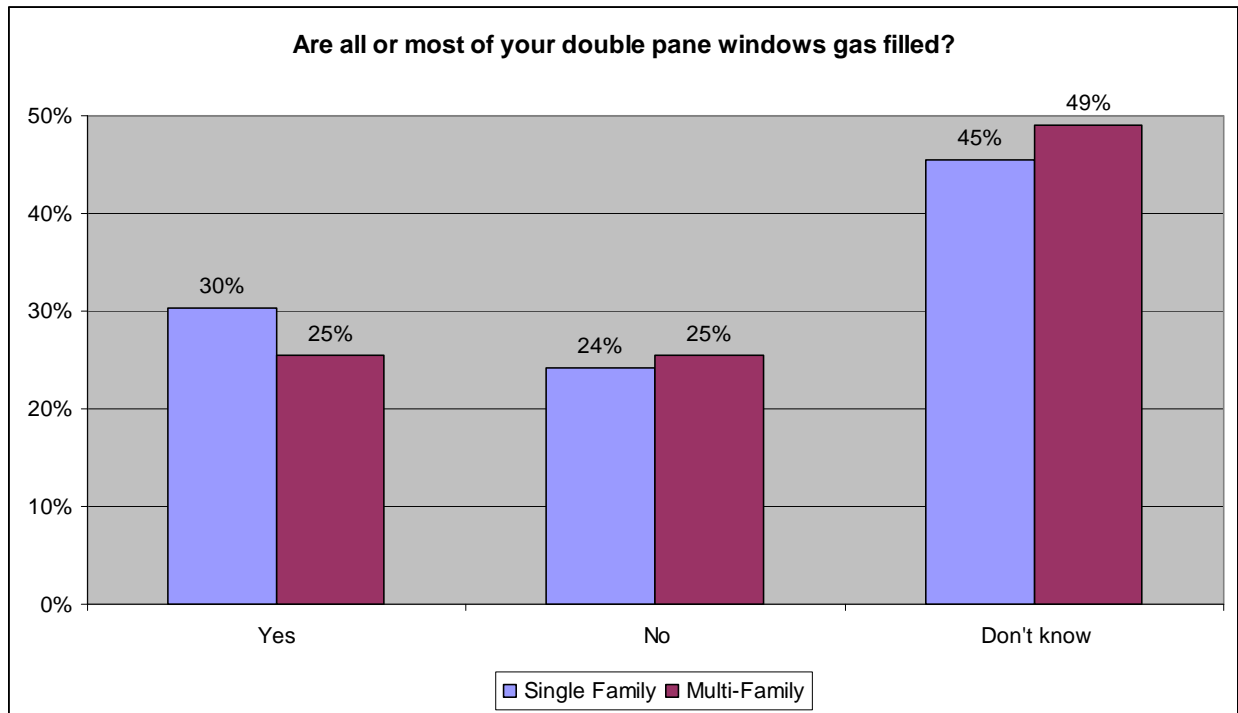


Respondents with double pane windows were asked if all or most of their double pane windows were gas filled. Less than one third of residents (29%) indicate having gas filled double pane windows. It is important to note that almost half the respondents with double pane windows (46%) report not knowing if their windows are gas filled.

Table 3-45: Gas-filled Double Pane Windows

<i>Are all or most of your double pane windows gas filled (e.g., argon)?</i>	<i>Single Family</i>		<i>Multi-Family</i>		<i>Total</i>	
	<i>N</i>	<i>SF%</i>	<i>N</i>	<i>MF%</i>	<i>N</i>	<i>%</i>
Yes	50	30%	13	25%	63	29%
No	40	24%	13	25%	53	25%
Don't know	75	45%	25	49%	100	46%
Total	165	100%	51	100%	216	100%

Figure 3-46: Gas-filled Double Pane Windows

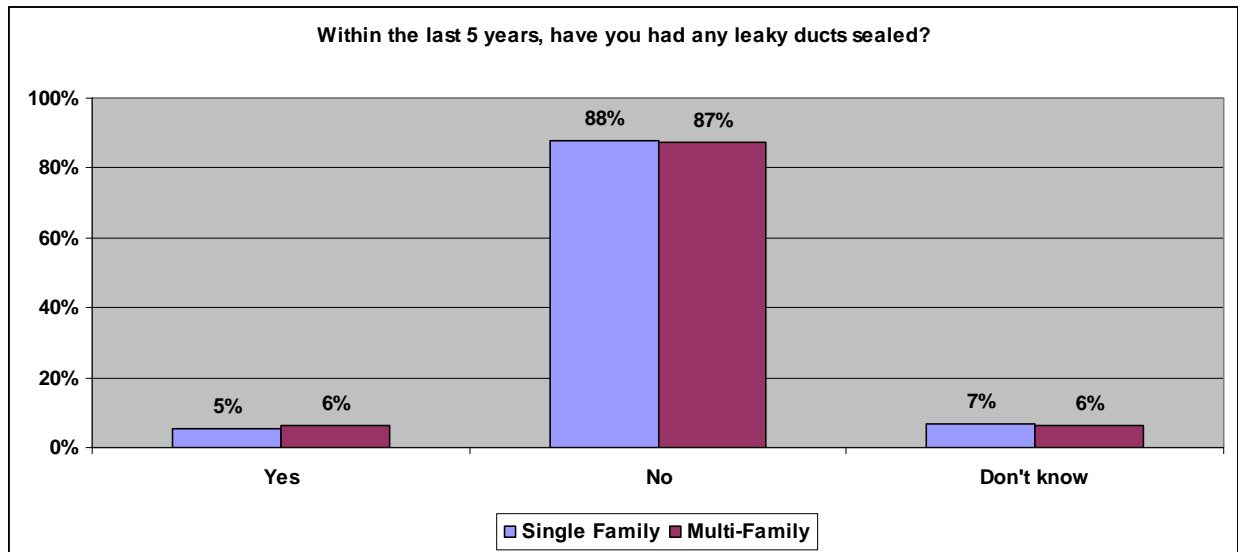


All respondents were asked if they had any leaky ducts sealed within the last five years, and if so, they were asked about their reasons for doing so. Only a small minority of residents (6%) report sealing leaky ducts within the last five years.

Table 3-46: Sealing of Leaky Ducts

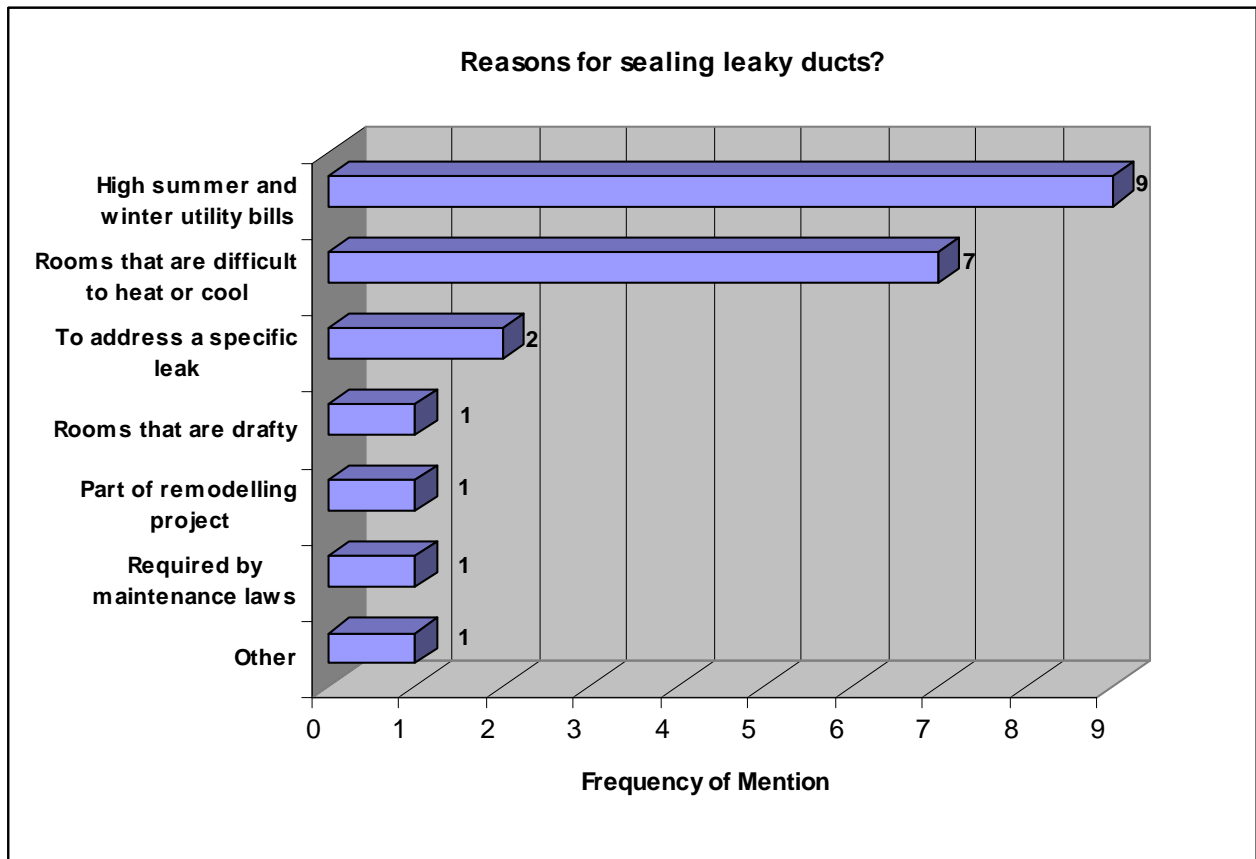
<i>Within the last 5 years, have you had leaky ducts sealed?</i>	<i>Single Family</i>		<i>Multi-Family</i>		<i>Total</i>	
	<i>N</i>	<i>SF%</i>	<i>N</i>	<i>MF%</i>	<i>N</i>	<i>%</i>
Yes	12	5%	5	6%	17	6%
No	195	88%	68	87%	263	88%
Don't know	15	7%	5	6%	20	7%
Total	222	100%	78	100%	300	100%

Figure 3-47: Sealing of Leaky Ducts



Respondent's reasons for sealing leaky ducts are presented in Figure 3-47. High seasonal utility bills and rooms that are difficult to heat and/or cool is the most frequently cited reason for sealing leaky ducts.

Figure 3-48: Reasons for Sealing Leaky Ducts



3.5 Home Cooling

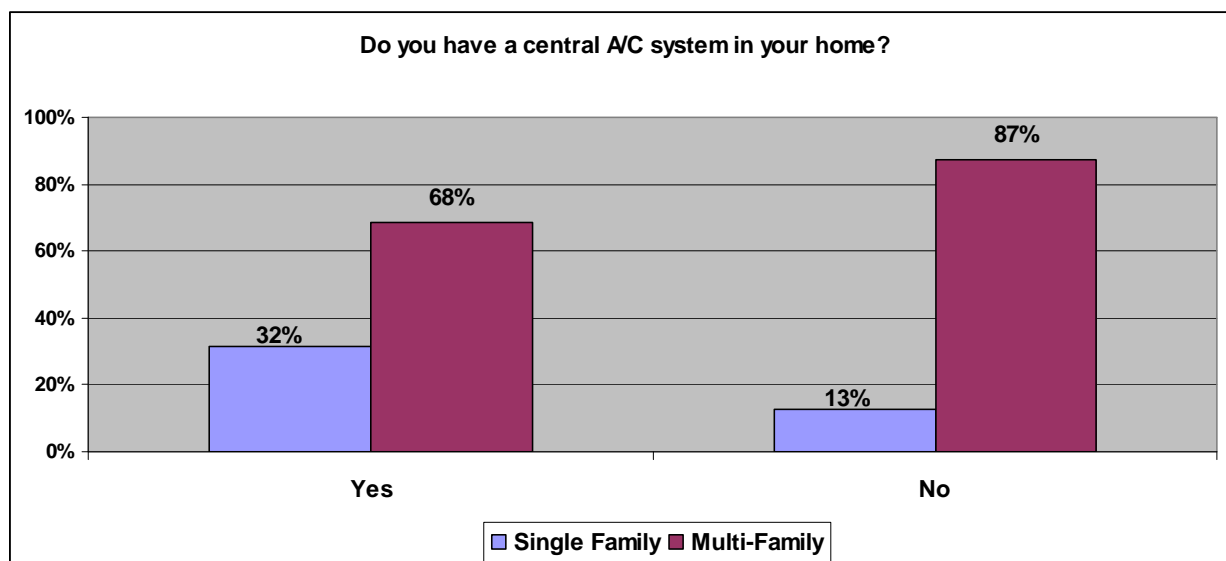
Respondents were asked to report if they had central air conditioning in their home.

Most residents (73%) indicate not having central-air conditioning systems.

Table 3-47: Central Air-Conditioning

<i>Do you have a central-air conditioning system in your home?</i>	<i>Single Family</i>		<i>Multi-Family</i>		<i>Total</i>	
	N	%	N	%	N	%
Yes	70	32%	10	13%	80	27%
No	152	68%	68	87%	220	73%
Total	222	100%	78	100%	300	100%

Figure 3-49: Central Air-Conditioning

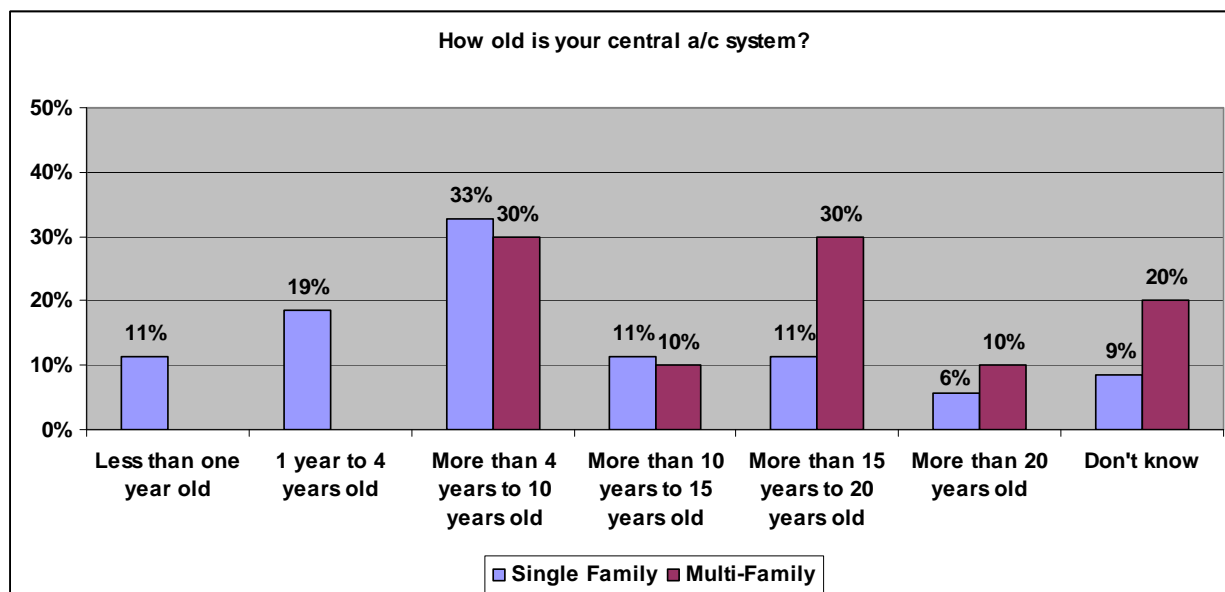


Those respondents with central air conditioning (n=80) were asked in a follow-up question to report on the age of their air-conditioning systems. Systems aged 4 to 10 years of age was the most frequently endorsed response (33%).

Table 3-48: Age of Central Air Conditioning System

<i>How old is your central air conditioning system?</i>	<i>Single Family</i>		<i>Multi-Family</i>		<i>Total</i>	
	<i>N</i>	<i>SF%</i>	<i>N</i>	<i>MF%</i>	<i>N</i>	<i>%</i>
Less than one year old	8	11%	0	0%	8	10%
1 year to 4 years old	13	19%	0	0%	13	16%
More than 4 years to 10 years old	23	33%	3	30%	26	33%
More than 10 years to 15 years old	8	11%	1	10%	9	11%
More than 15 years to 20 years old	8	11%	3	30%	11	14%
More than 20 years old	4	6%	1	10%	5	6%
Don't know	6	9%	2	20%	8	10%
Total	70	100%	10	100%	80	100%

Figure 3-50: Age of Central Air Conditioning System

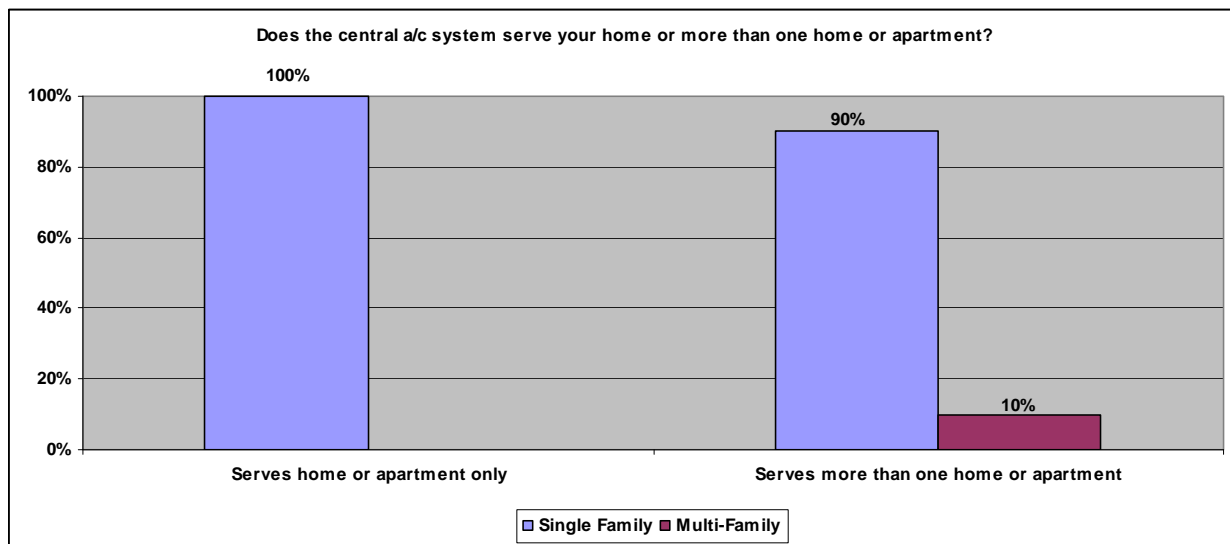


Customers with central air conditioning were also asked to indicate if their central air-conditioning system serves more than one home or apartment. Virtually all respondents (99%) indicate their central air-conditioning system serves only one dwelling.

Table 3-49: Number of Homes Served by Central Air-Conditioning

<i>Does the central air conditioning system serve your home or more than one home or apartment?</i>	<i>Single Family</i>		<i>Multi-Family</i>		<i>Total</i>	
	N	%	N	%	N	%
Serves home or apartment only	70	100%	9	90%	79	99%
Serves more than one home or apartment	0	0%	1	10%	1	1%
Total	70	100%	10	100%	80	100%

Figure 3-51: Number of Homes Served by Central Air-Conditioning

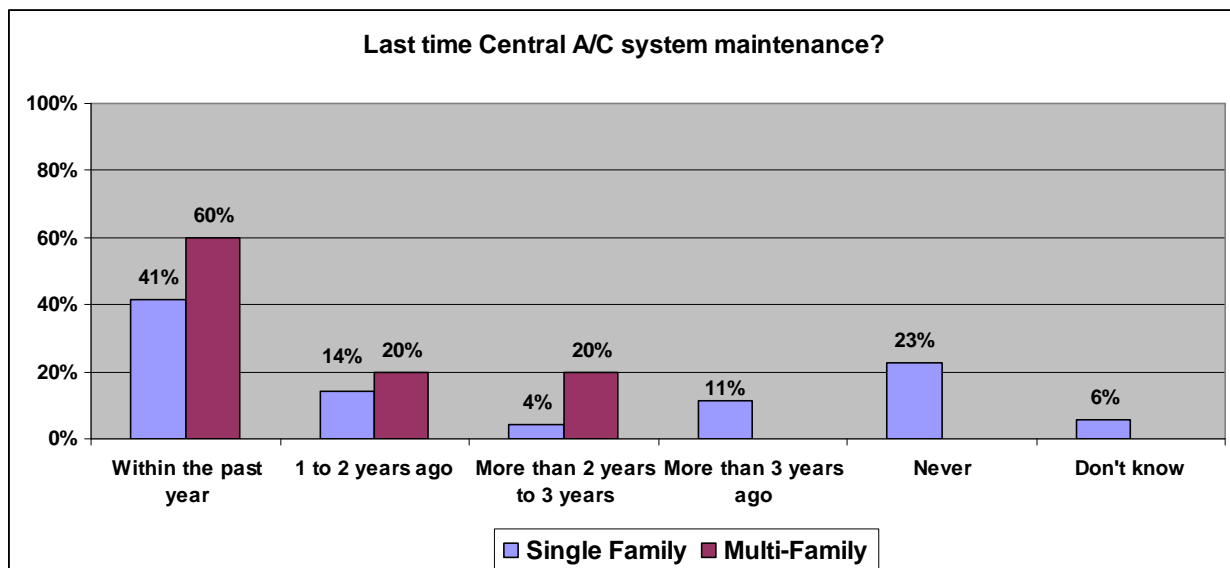


Almost half of respondents with central air-conditioning (44%) report they conducted maintenance on their system within the past year.

Table 3-50: Central A/C System Maintenance

When was the last time you had maintenance done on the central air conditioning system in your home?	House Type				Total	
	Single Family	SF%	Multi-Family	MF%		
Within the past year	29	41%	6	60%	35	44%
1 to 2 years ago	10	14%	2	20%	12	15%
More than 2 years to 3 years	3	4%	2	20%	5	6%
More than 3 years ago	8	11%	0	0%	8	10%
Never	16	23%	0	0%	16	20%
Don't know	4	6%	0	0%	4	5%
Total	70	100%	10	100%	80	100%

Figure 3-52: Central A/C System Maintenance

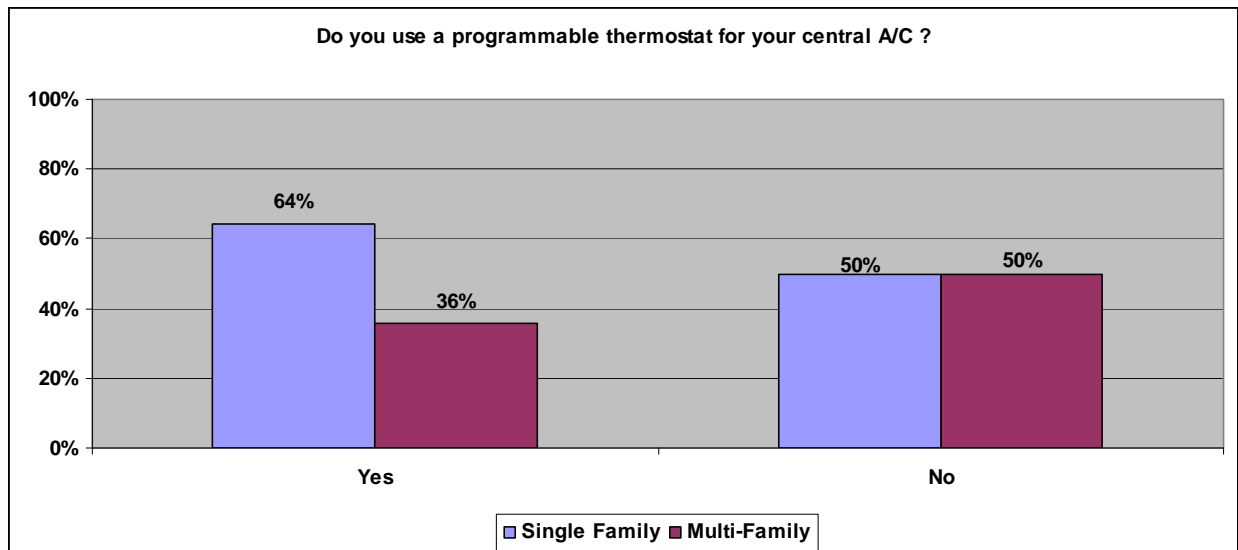


Customers were asked to indicate whether or not they use programmable thermostats for their central air conditioners. The majority of respondents (63%) use a programmable thermostat for their central air-conditioner. However, programmable thermostat use is noticeably higher in single-family (64%) than multi-family (50%) residences.

Table 3-51: Programmable Thermostat Use

<i>Do you use a programmable thermostat?</i>	<i>Single Family</i>		<i>Multi-Family</i>		<i>Total</i>	
	N	%	N	%	N	%
Yes	45	64%	5	50%	50	63%
No	25	36%	5	50%	30	38%
Total	70	100%	10	100%	80	100%

Figure 3-53: Programmable Thermostat for Central A/C

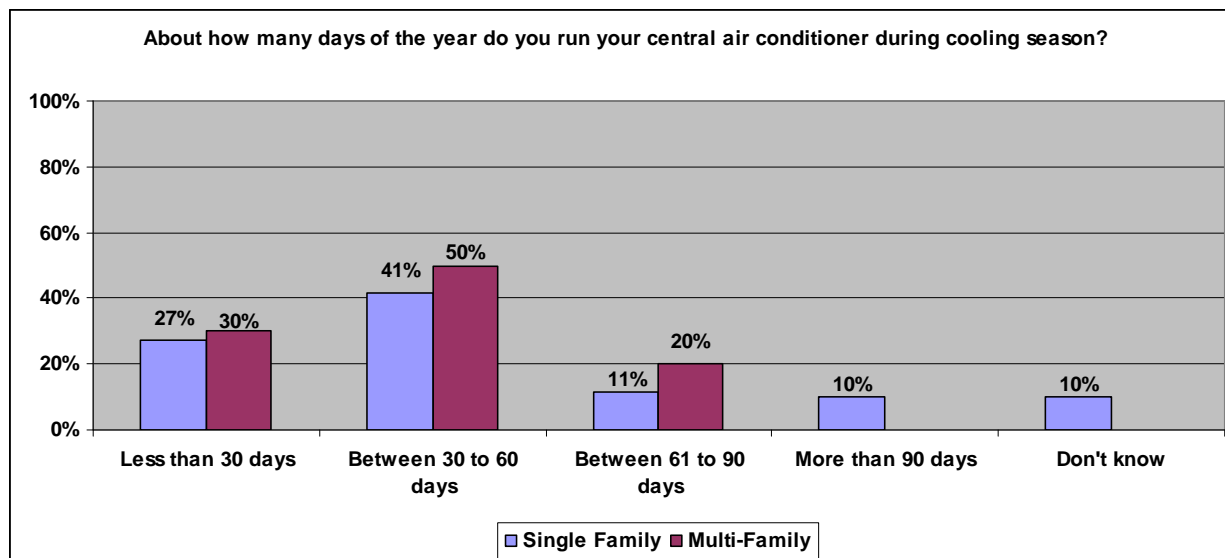


Regarding how often central air conditioning is used during the cooling season, 71% of customers indicate they run their central air conditioning 60 days or less.

Table 3-52: Central A/C Schedule (# of Days in Use)

About how many days of the year do you run your central air conditioner during cooling season?	Single Family		Multi-Family		Total	
	N	%	N	%	N	%
Less than 30 days	19	27%	3	30%	22	28%
Between 30 to 60 days	29	41%	5	50%	34	43%
Between 61 to 90 days	8	11%	2	20%	10	13%
More than 90 days	7	10%	0	0%	7	9%
Don't know	7	10%	0	0%	7	9%
Total	70	100%	10	100%	80	100%

Figure 3-54: Central A/C Schedule (# of Days in Use)

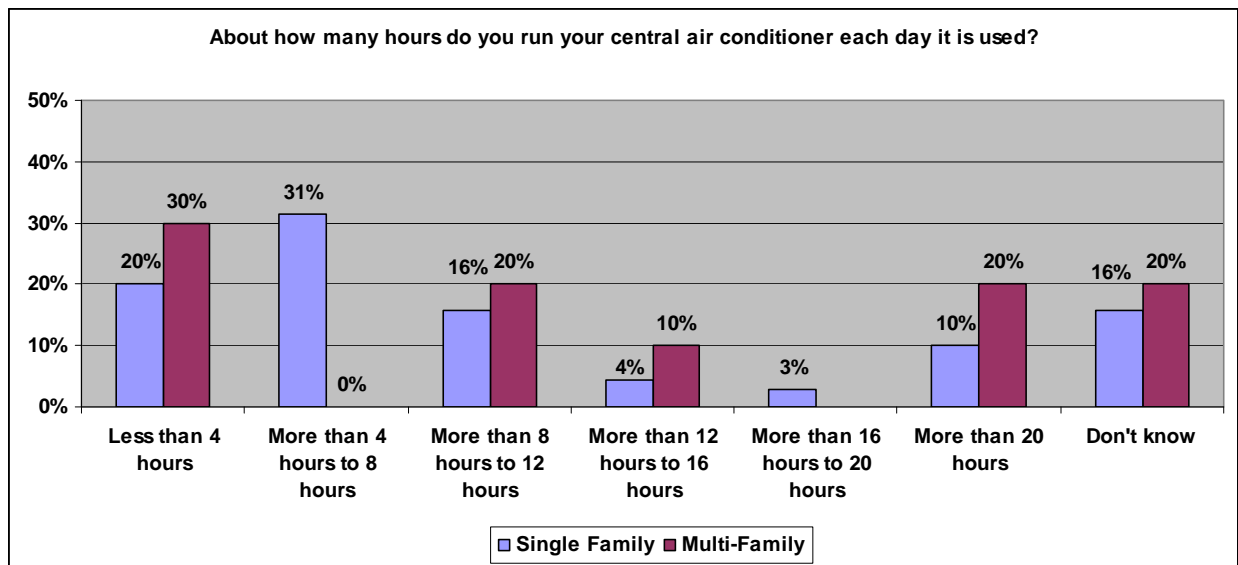


To further characterize how often respondents utilize their central air conditioning systems, customers were asked to indicate how often they run their central air conditioner each day it is used. Almost half the customers (49%) report using their central air conditioner up to 8 hours each day it used.

Table 3-53: Central A/C Schedule (# of Hours in Use)

<i>About how many hours do you run your central air conditioner each day it is used?</i>	<i>Single Family</i>		<i>Multi-Family</i>		<i>Total</i>	
	N	%	N	%	N	%
Less than 4 hours	14	20%	3	30%	17	21%
More than 4 hours to 8 hours	22	31%	0	0%	22	28%
More than 8 hours to 12 hours	11	16%	2	20%	13	16%
More than 12 hours to 16 hours	3	4%	1	10%	4	5%
More than 16 hours to 20 hours	2	3%	0	0%	2	3%
More than 20 hours	7	10%	2	20%	9	11%
Don't know	11	16%	2	20%	13	16%
Total	70	100%	10	100%	80	21%

Figure 3-55: Central A/C Schedule (# of Hours in Use)

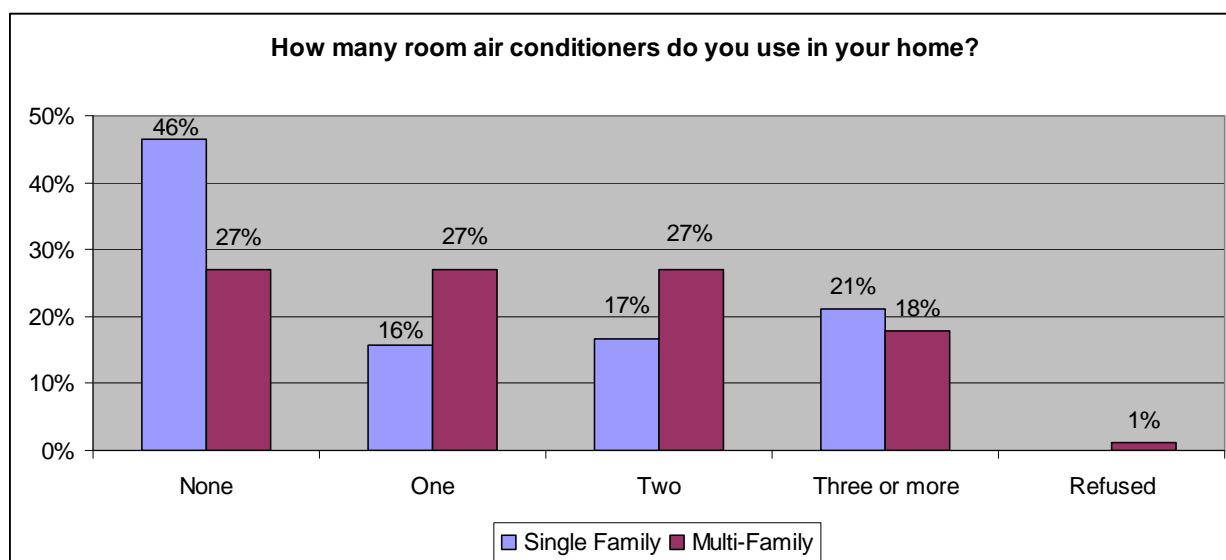


In addition to central air conditioning systems, customers were asked to report on the number of room conditioners in their residences. Even though almost half the respondents (41%) report not using a room air conditioner in their home, 20% indicate using three or more.

Table 3-54: Quantity of Room Air Conditioners

<i>How many room air conditioners do you use in your home?</i>	<i>Single Family</i>		<i>Multi-Family</i>		<i>Total</i>	
	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>
None	103	46%	21	27%	124	41%
One	35	16%	21	27%	56	19%
Two	37	17%	21	27%	58	19%
Three or more	47	21%	14	18%	61	20%
Refused	0	0%	1	1%	1	0%
Total	222	100%	78	100%	300	100%

Figure 3-56: Quantity of Room Air Conditioners

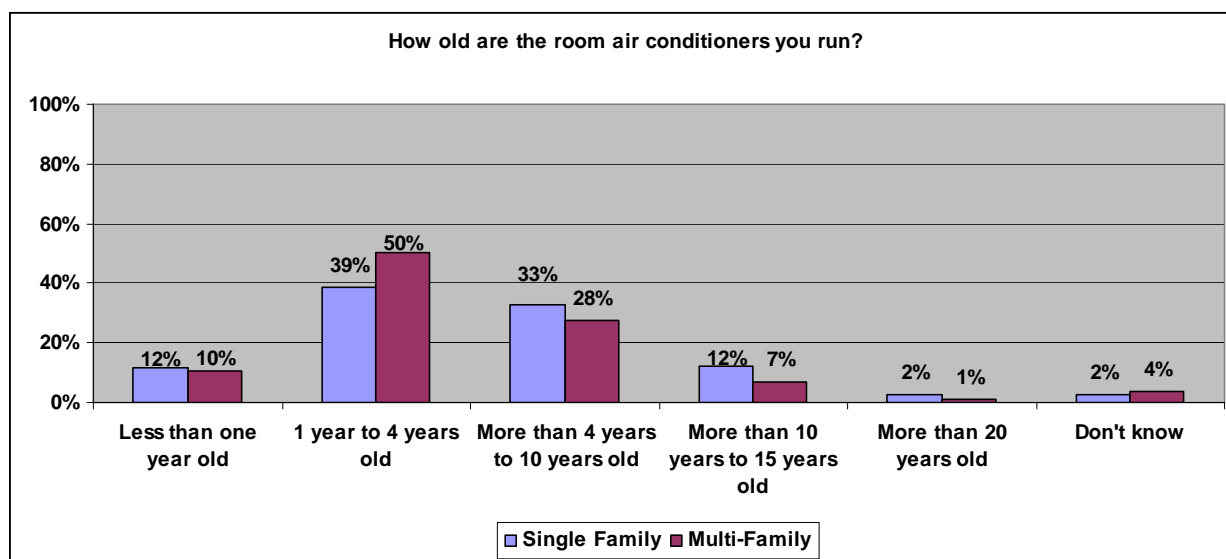


Those respondents with room air conditioning (n=175) were asked in a follow-up question to report on the age of their room air-conditioning systems. Systems aged 1 to 4 years of age was the most frequently endorsed response (42%). Only 12% of room air-conditioners are older than 10 years.

Table 3-55: Age of Room Air Conditioners

<i>How old are the room air conditioners you run?</i>	<i>Single Family</i>		<i>Multi-Family</i>		<i>Total</i>	
	<i>N</i>	<i>SF%</i>	<i>N</i>	<i>MF%</i>	<i>N</i>	<i>%</i>
Less than one year old	29	12%	11	10%	40	11%
1 year to 4 years old	97	39%	53	50%	150	42%
More than 4 years to 10 years old	82	33%	29	28%	111	31%
More than 10 years to 15 years old	30	12%	7	7%	37	10%
More than 20 years old	6	2%	1	1%	7	2%
Don't know	6	2%	4	4%	10	3%
Total	250	100%	105	100%	355	100%

Figure 3-57: Age of Room Air Conditioning Systems

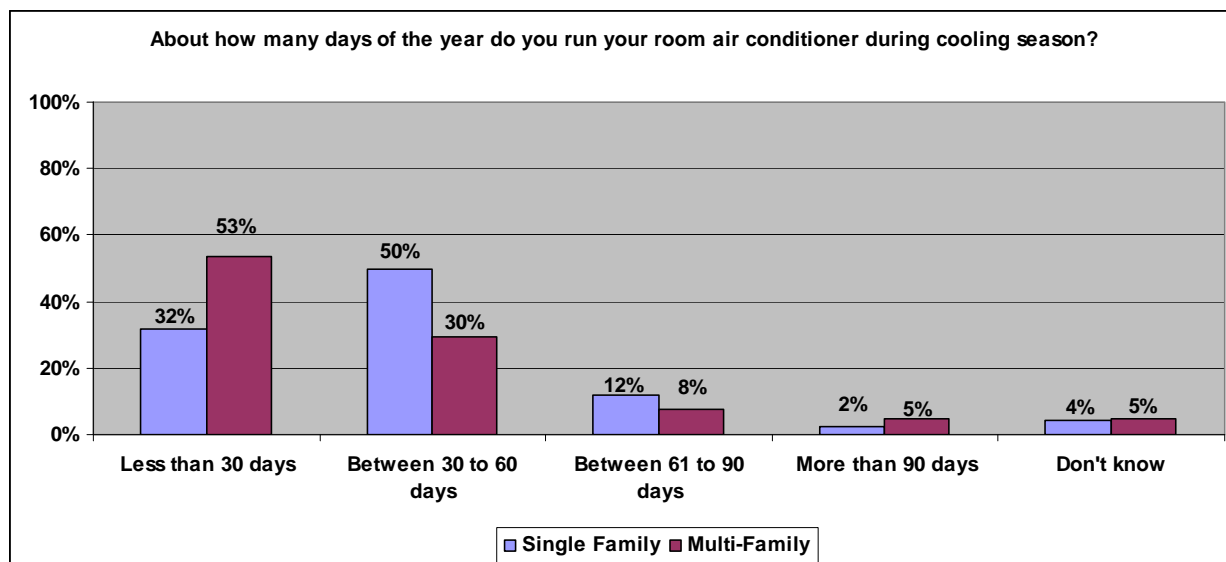


Regarding how often room air conditioning is used during the cooling season, 82% of customers indicate they run their central air conditioning up to 60 days.

Table 3-56: Room A/C Schedule

About how many days of the year do you run your room air conditioner during cooling season?	Single Family		Multi-Family		Total	
	N	%	N	%	N	%
Less than 30 days	79	32%	56	53%	135	38%
Between 30 to 60 days	124	50%	31	30%	155	44%
Between 61 to 90 days	30	12%	8	8%	38	11%
More than 90 days	6	2%	5	5%	11	3%
Don't know	11	4%	5	5%	16	5%
Total	250	100%	105	100%	355	100%

Figure 3-58: Room A/C Schedule

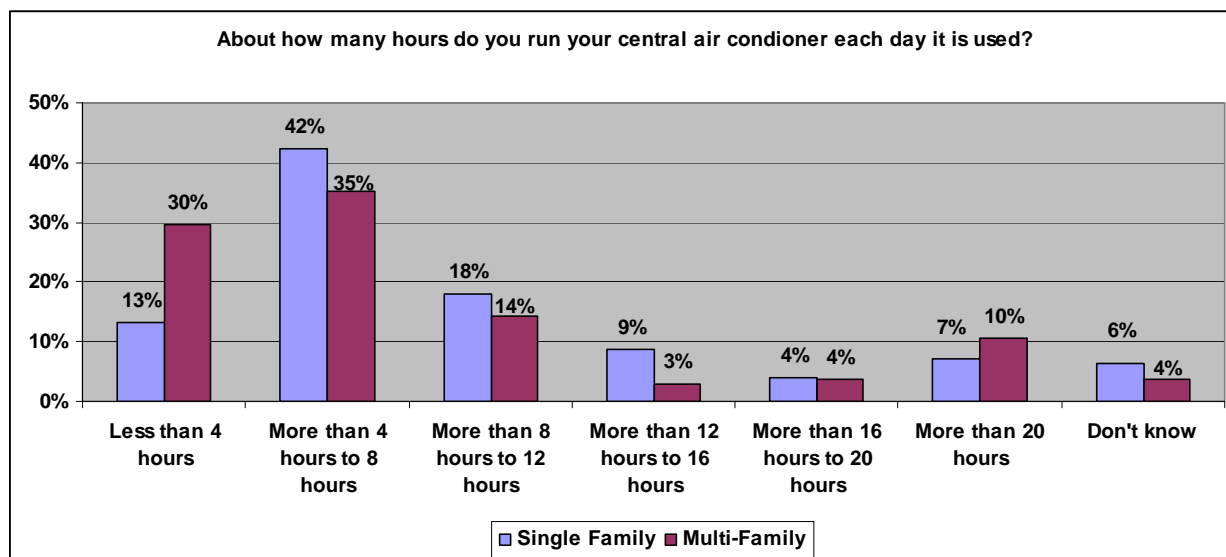


To further characterize how often respondents utilize their room air conditioning systems, customers were asked to indicate how often they run their room air conditioner each day it is used. Three quarters of residential customers surveyed report using their room air conditioners up to 12 hours each day it used.

Table 3-57: Room A/C Schedule (# of Hours in Use)

<i>About how many hours do you run your central air conditioner each day it is used?</i>	<i>Single Family</i>		<i>Multi-Family</i>		<i>Total</i>	
	N	%	N	%	N	%
Less than 4 hours	33	13%	31	30%	64	18%
More than 4 hours to 8 hours	106	42%	37	35%	143	40%
More than 8 hours to 12 hours	45	18%	15	14%	60	17%
More than 12 hours to 16 hours	22	9%	3	3%	25	7%
More than 16 hours to 20 hours	10	4%	4	4%	14	4%
More than 20 hours	18	7%	11	10%	29	8%
Don't know	16	6%	4	4%	20	6%
Total	250	100%	105	100%	355	100%

Figure 3-59: Room A/C Schedule (# of Hours in Use)



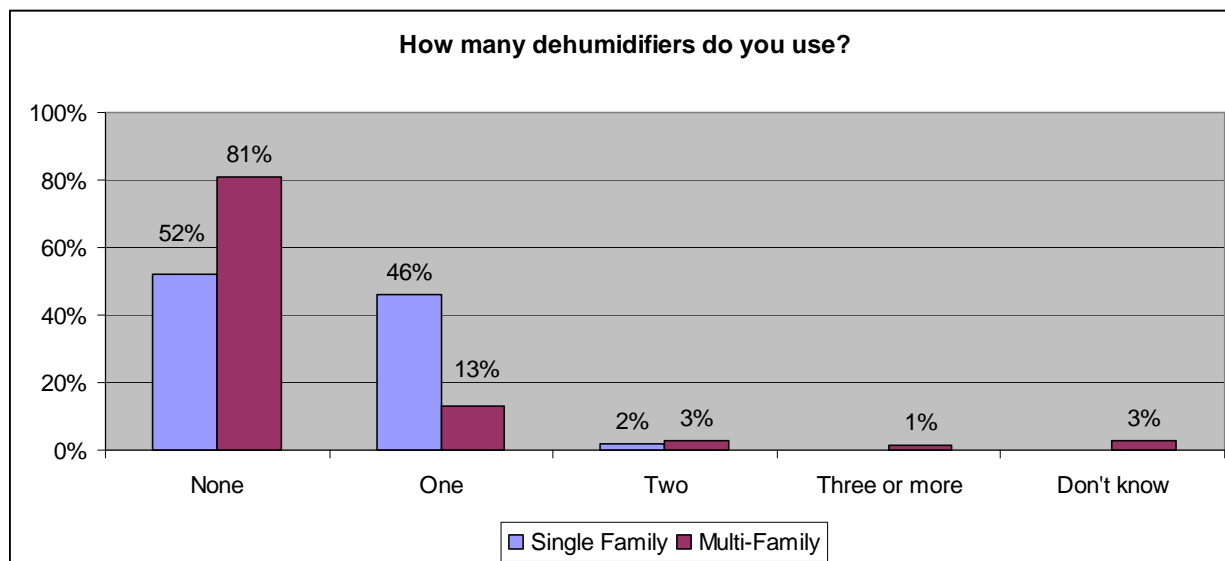
3.6 Dehumidifiers

Customers were asked to report on the number of dehumidifiers they use. The majority of respondents (60%) do not use dehumidifiers.

Table 3-58: Quantity of Dehumidifiers

How many dehumidifiers do you use?	Single Family		Multi-Family		Total	
	N	%	N	%	N	%
None	116	52%	63	81%	179	60%
One	102	46%	10	13%	112	37%
Two	4	2%	2	3%	6	2%
Three or more	0	0%	1	1%	1	0%
Don't know	0	0%	2	3%	2	1%
Total	222	100%	78	100%	300	100%

Figure 3-60: Quantity of Dehumidifiers

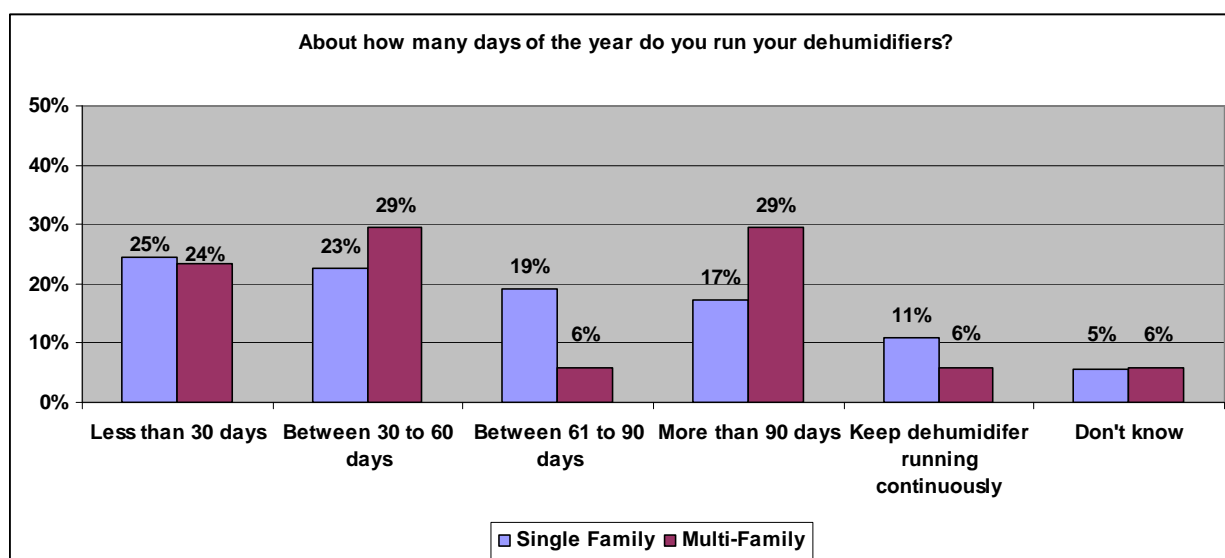


Customers with dehumidifiers (n=119) were asked to report on the number of days they are run each year. Almost half the respondents (48%) report running their dehumidifiers up to 60 days per year.

Table 3-59: Dehumidifier Schedule (# of Days in Use)

About how many days of the year do you run your dehumidifiers?	Single Family		Multi-Family		Total	
	N	%	N	%	N	%
Less than 30 days	27	25%	4	24%	31	24%
Between 30 to 60 days	25	23%	5	29%	30	24%
Between 61 to 90 days	21	19%	1	6%	22	17%
More than 90 days	19	17%	5	29%	24	19%
Keep dehumidifier running continuously	12	11%	1	6%	13	10%
Don't know	6	5%	1	6%	7	6%
Total	110	100%	17	100%	127	100%

Figure 3-61: Dehumidifier Schedule (# of Days in Use)



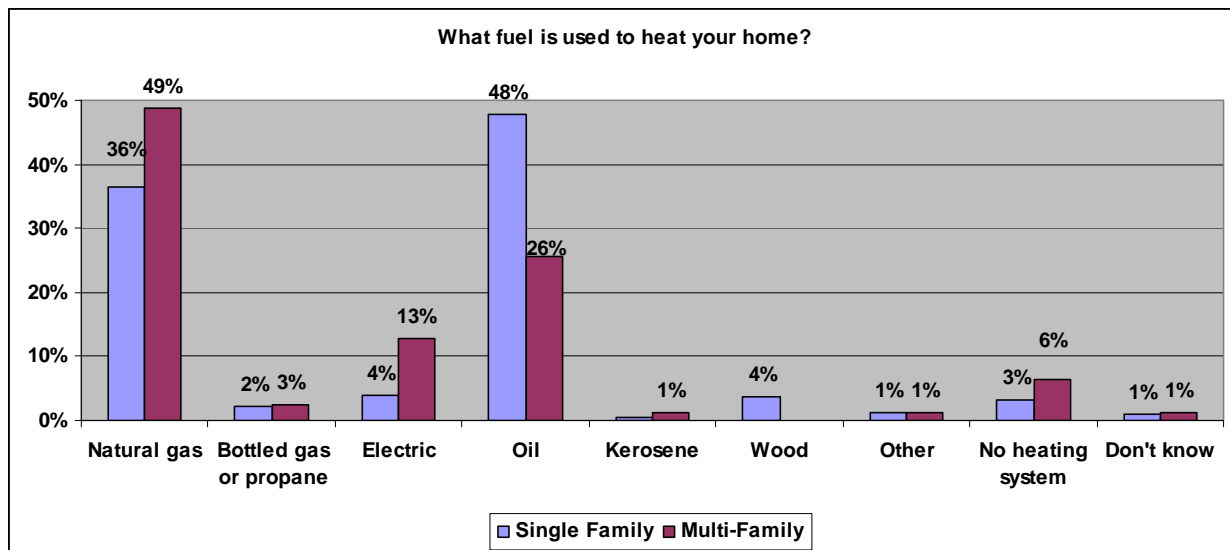
3.6 Home Heating

Respondents were asked to indicate the type of fuel they use to heat their home. The majority of single-family residences use oil for heating (48%), while the majority of multi-family residences use natural gas (49%). A complete list of responses is presented in the Table 3-60.

Table 3-60: Heating Fuel Type

What fuel is used to heat your home?	Single Family		Multi-Family		Total	
	N	%	N	%	N	%
Oil	106	48%	20	26%	126	42%
Natural gas	81	36%	38	49%	119	40%
Electric	9	4%	10	13%	19	6%
Wood	8	4%	0	0%	8	3%
Bottled gas or propane	5	2%	2	3%	7	2%
Kerosene	1	0%	1	1%	2	1%
Other	3	1%	1	1%	4	1%
No heating system	7	3%	5	6%	12	4%
Don't know	2	1%	1	1%	3	1%
Total	222	100%	78	100%	300	100%

Figure 3-62: Heating Fuel Type

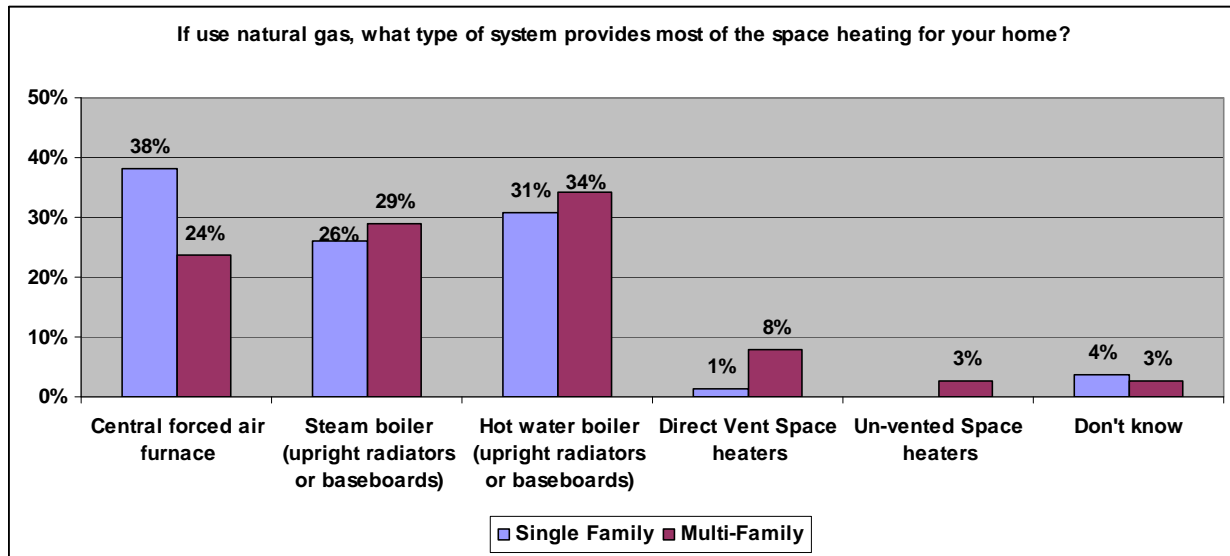


Central forced air furnaces (34%), hot water boilers (32%) and steam boilers (27%) were the most prevalent systems used by residential customers using natural gas as the main fuel to heat their home (n=119).

Table 3-61: Heating System Type, Natural Gas

<i>What type of system provides most of the space heating for your home?</i>	<i>Single Family</i>		<i>Multi-Family</i>		<i>Total</i>	
	<i>N</i>	<i>SF%</i>	<i>N</i>	<i>MF%</i>	<i>N</i>	<i>%</i>
Central forced air furnace	31	38%	9	24%	40	34%
Steam boiler (upright radiators or baseboards)	21	26%	11	29%	32	27%
Hot water boiler (upright radiators or baseboards)	25	31%	13	34%	38	32%
Direct Vent Space heaters	1	1%	3	8%	4	3%
Un-vented Space heaters	0	0%	1	3%	1	1%
Don't know	3	4%	1	3%	4	3%
Total	81	100%	38	100%	119	100%

Figure 3-63: Heating System Type, Natural Gas

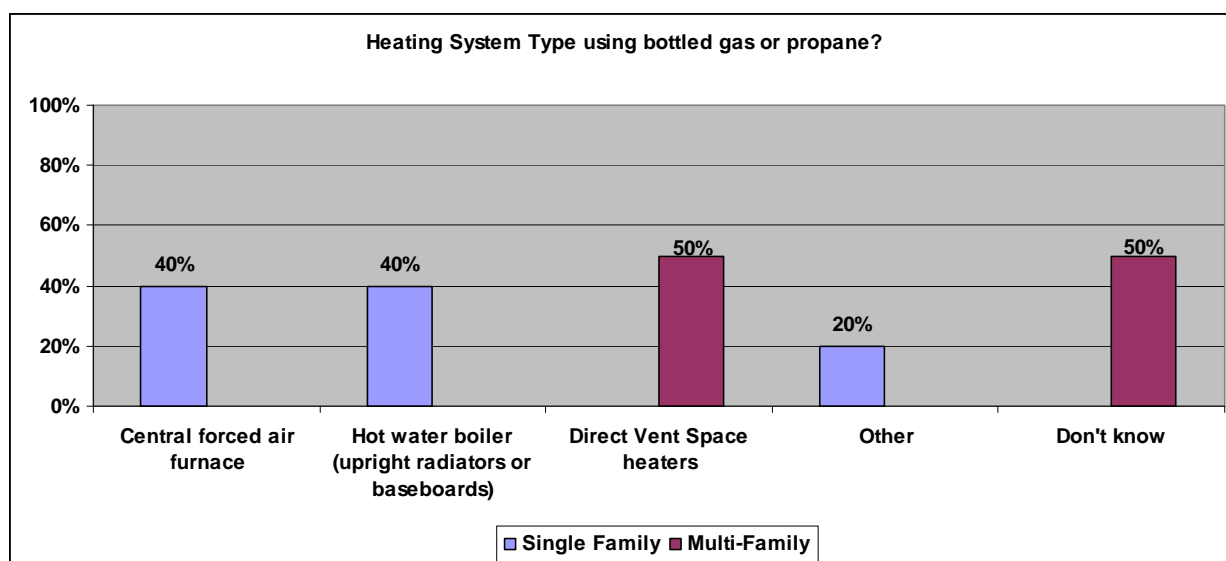


Central forced air furnaces (29%) and hot water boilers (29%) were the most prevalent systems used by residential customers using bottled gas or propane as the main fuel to heat their home (n=7).

Table 3-62: Heating System Type, Bottled Gas or Propane

<i>If use bottled gas or propane, what type of system provides most of the space heating for your home?</i>	<i>Single Family</i>		<i>Multi-Family</i>		<i>Total</i>	
	<i>N</i>	<i>SF%</i>	<i>N</i>	<i>MF%</i>	<i>N</i>	<i>%</i>
Central forced air furnace	2	40%	0	0%	2	29%
Hot water boiler (upright radiators or baseboards)	2	40%	0	0%	2	29%
Direct Vent Space heaters	0	0%	1	50%	1	14%
Other	1	20%	0	0%	1	14%
Don't know	0	0%	1	50%	1	14%
Total	5	100%	2	100%	7	100%

Figure 3-64: Heating System Type, Bottled Gas or Propane

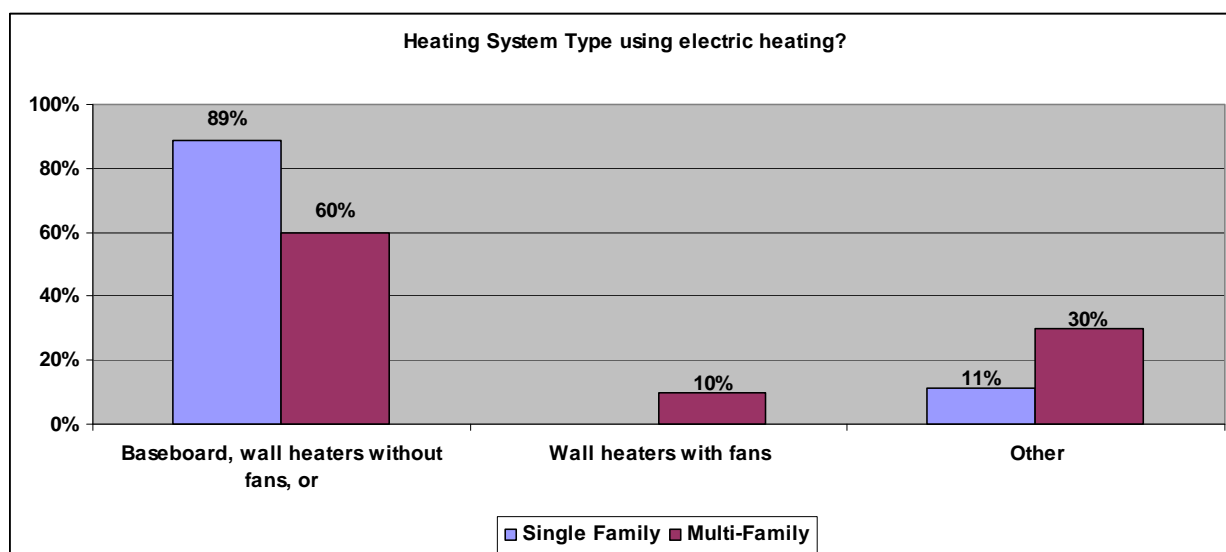


Baseboard, wall heaters without fans, or ceiling cables (74%) were the most prevalent systems used by residential customers using electric heating as the main fuel to heat their home (n=19).

Table 3-63: Heating System Type, Electric Heating

<i>If use electric heating, What type of system provides most of the space heating for your home?</i>	<i>Single Family</i>		<i>Multi-Family</i>		<i>Total</i>	
	<i>N</i>	<i>SF%</i>	<i>N</i>	<i>MF%</i>	<i>N</i>	<i>%</i>
Baseboard, wall heaters without fans, or ceiling cables	8	89%	6	60%	14	74%
Wall heaters with fans	0	0%	1	10%	1	5%
Other	1	11%	3	30%	4	21%
Total	9	100%	10	100%	19	100%

Figure 3-65: Heating System Type, Electric Heating

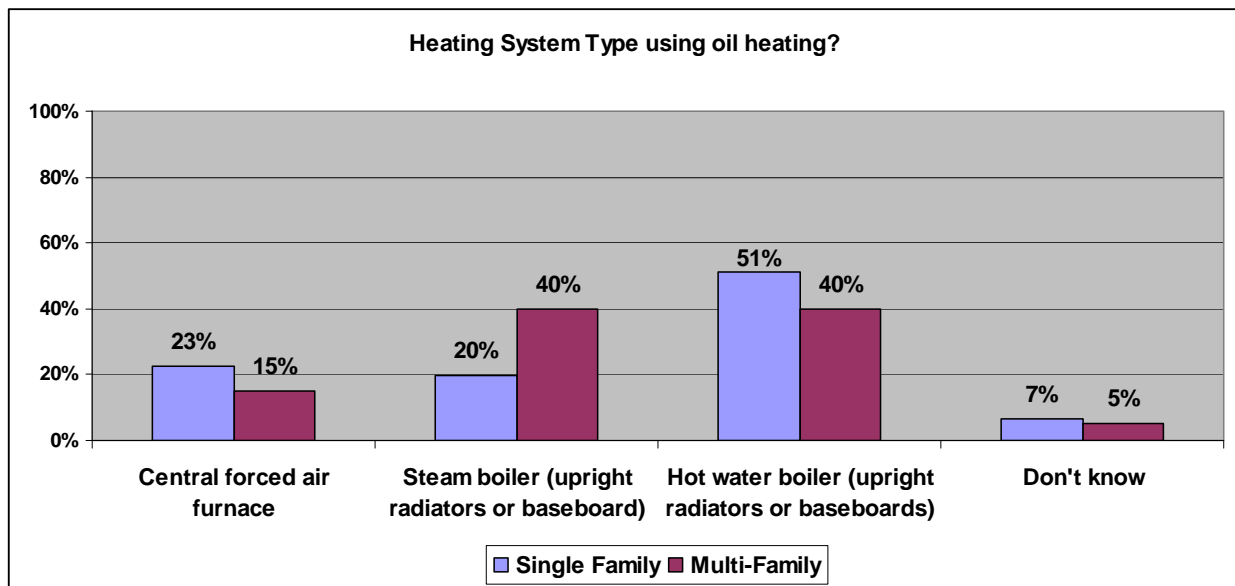


Hot water boilers (49%) were the most prevalent systems used by residential customers using oil as the main fuel to heat their home (n=126).

Table 3-64: Heating System Type, Oil Heating

<i>If use oil, What type of system provides most of the space heating for your home?</i>	<i>Single Family</i>		<i>Multi-Family</i>		<i>Total</i>	
	<i>N</i>	<i>SF%</i>	<i>N</i>	<i>MF%</i>	<i>N</i>	<i>%</i>
Central forced air furnace	24	23%	3	15%	27	21%
Steam boiler (upright radiators or baseboard)	21	20%	8	40%	29	23%
Hot water boiler (upright radiators or baseboards)	54	51%	8	40%	62	49%
Don't know	7	7%	1	5%	8	6%
Total	106	100%	20	100%	126	100%

Figure 3-66: Heating System Type, Oil Heating

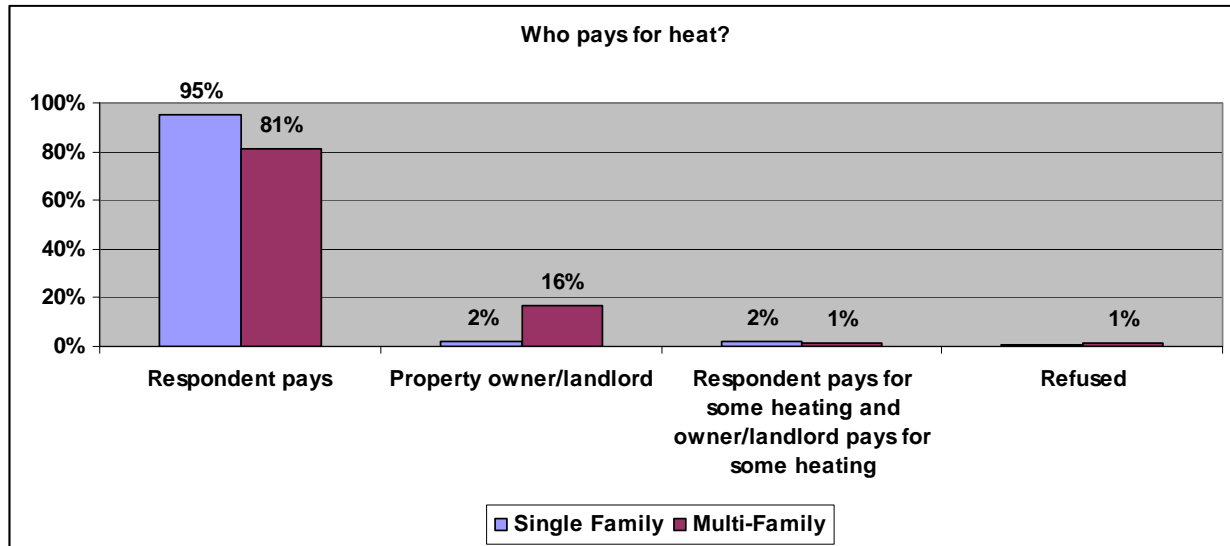


The head of the household reports almost always paying the heating bill (91%), without a landlord providing disbursement.

Table 3-65: Paying for Heat

<i>Who is responsible for paying to heat your home?</i>	<i>Single Family</i>		<i>Multi-Family</i>		<i>Total</i>	
	<i>N</i>	<i>SF%</i>	<i>N</i>	<i>MF%</i>	<i>N</i>	<i>%</i>
Respondent pays	205	95%	59	81%	264	91%
Property owner/landlord	5	2%	12	16%	17	6%
Respondent pays for some heating and landlord pays for some heating	4	2%	1	1%	5	2%
Refused	1	0%	1	1%	2	1%
Total	215	100%	73	100%	288	100%

Figure 3-67: Paying for Heat

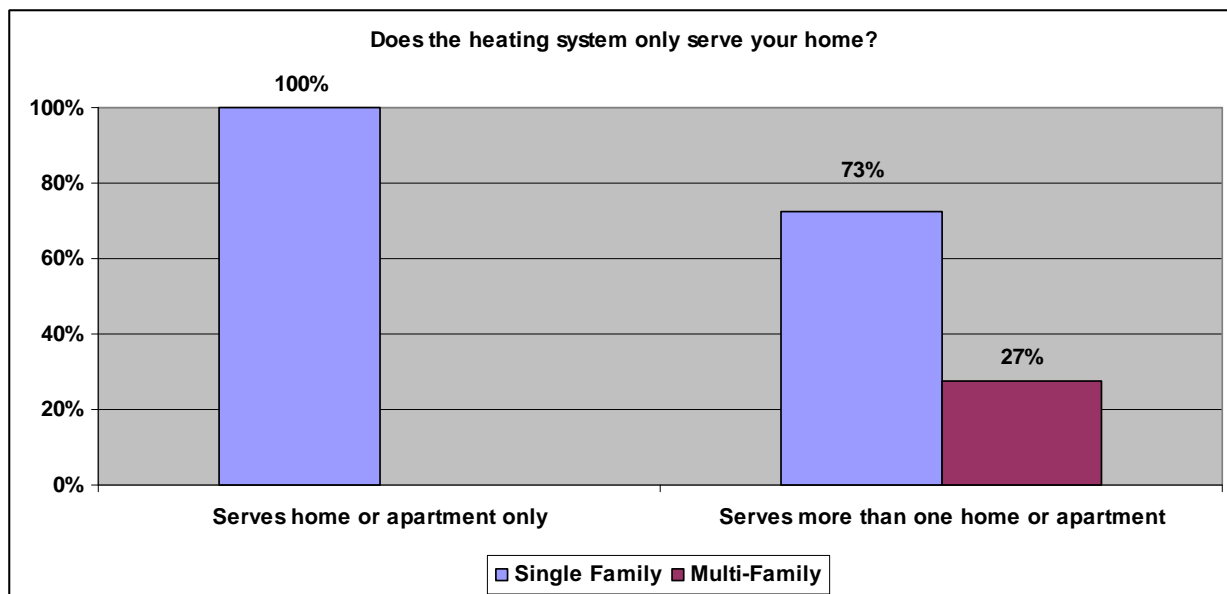


All single family respondents report their heating system serves *only* their home or apartment. In contrast, over a quarter of multi-family respondents (27%) report their heating system serves *more* than one home or apartment.

Table 3-66: Homes on Heating System

<i>Does the heating system only serve your home or more than one home or apartment?</i>	<i>Single Family</i>		<i>Multi-Family</i>		<i>Total</i>	
	<i>N</i>	<i>SF%</i>	<i>N</i>	<i>MF%</i>	<i>N</i>	<i>%</i>
Serves home or apartment only	215	100%	53	73%	268	93%
Serves more than one home or apartment	0	0%	20	27%	20	7%
Total	215	100%	73	100%	288	100%

Figure 3-68: Homes on Heating System

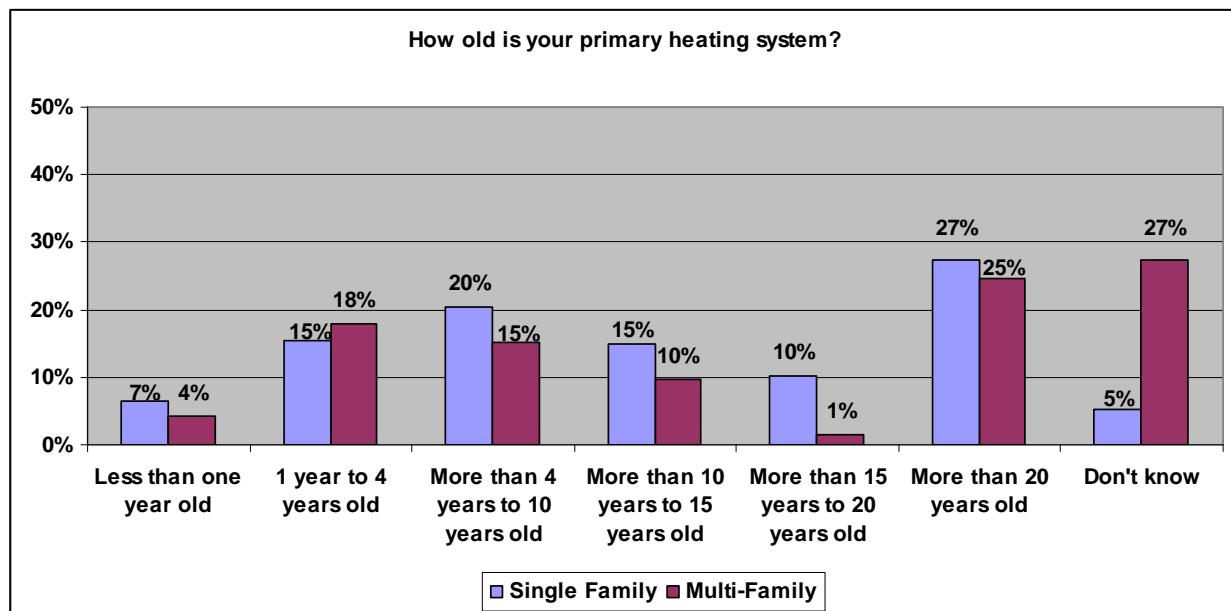


The majority of respondents (59%) report the age of their primary heating system is more than ten years old. Furthermore, over a quarter of respondents (27%) report their primary heating system is more than 20 years old. There is a strong likelihood that the potential energy savings via new systems or retrofits for primary heating systems in Rhode Island will be very large. In addition, over a quarter of multi-family respondents (27%) do not know the age of their primary heating system and it may be reasonable to assume that a significant percentage of these “unknown” systems are ready for replacement or retrofitting.

Table 3-67: Age of Primary Heating System

<i>How old is your primary heating system?</i>	<i>Single Family</i>		<i>Multi-Family</i>		<i>Total</i>	
	<i>N</i>	<i>SF%</i>	<i>N</i>	<i>MF%</i>	<i>N</i>	<i>%</i>
Less than one year old	14	7%	3	4%	17	6%
1 year to 4 years old	33	15%	13	18%	46	16%
More than 4 years to 10 years old	44	20%	11	15%	55	19%
More than 10 years to 15 years old	32	15%	7	10%	39	13%
More than 15 years to 20 years old	22	10%	1	1%	23	8%
More than 20 years old	59	27%	18	25%	77	27%
Don't know	11	5%	20	27%	31	11%
Total	215	100%	73	100%	288	100%

Figure 3-69: Age of Primary Heating System

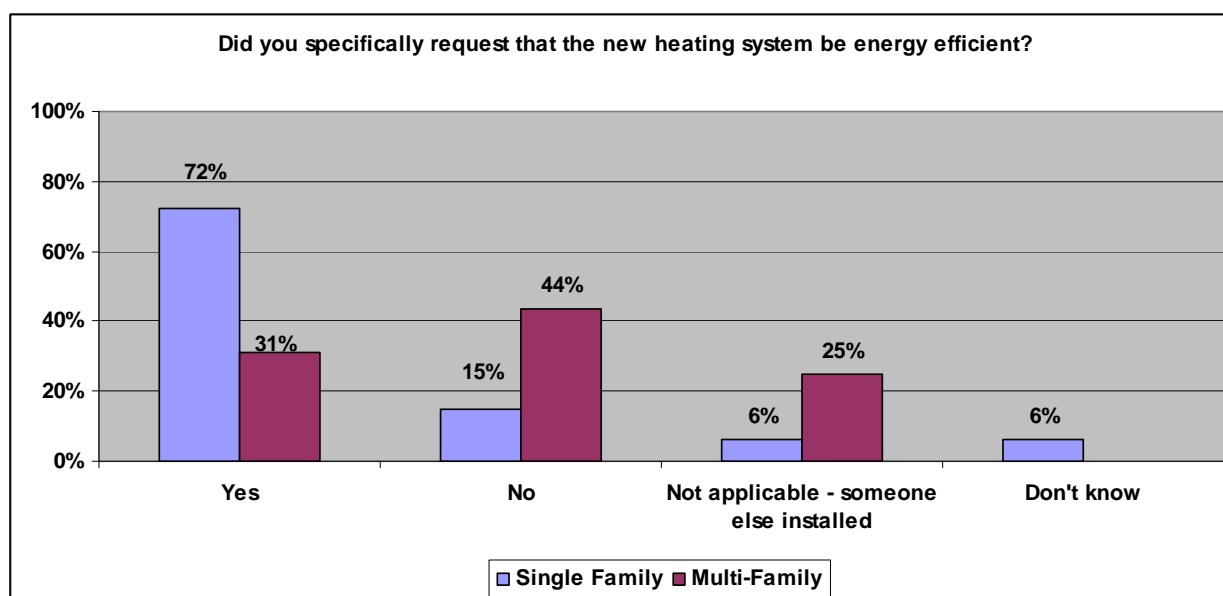


The majority of respondents (62%) report they specifically requested their new heating system be energy efficient. However, there is a clear demarcation between requests made by single family homes and multi-family homes. Nearly three quarters of single family respondents (72%) indicate they initiated a request for their new heating system to be energy efficient, whereas less than a third of multi-family respondents (31%) report making such a request.

Table 3-68: Energy Efficient Heating System Requests

<i>Did you specifically request that the new heating system be energy efficient?</i>	<i>Single Family</i>		<i>Multi-Family</i>		<i>Total</i>	
	<i>N</i>	<i>SF%</i>	<i>N</i>	<i>MF%</i>	<i>N</i>	<i>%</i>
Yes	34	72%	5	31%	39	62%
No	7	15%	7	44%	14	22%
Not applicable - someone else installed	3	6%	4	25%	7	11%
Don't know	3	6%	0	0%	3	5%
Total	47	100%	16	100%	63	100%

Figure 3-70: Energy Efficient Heating System Requests

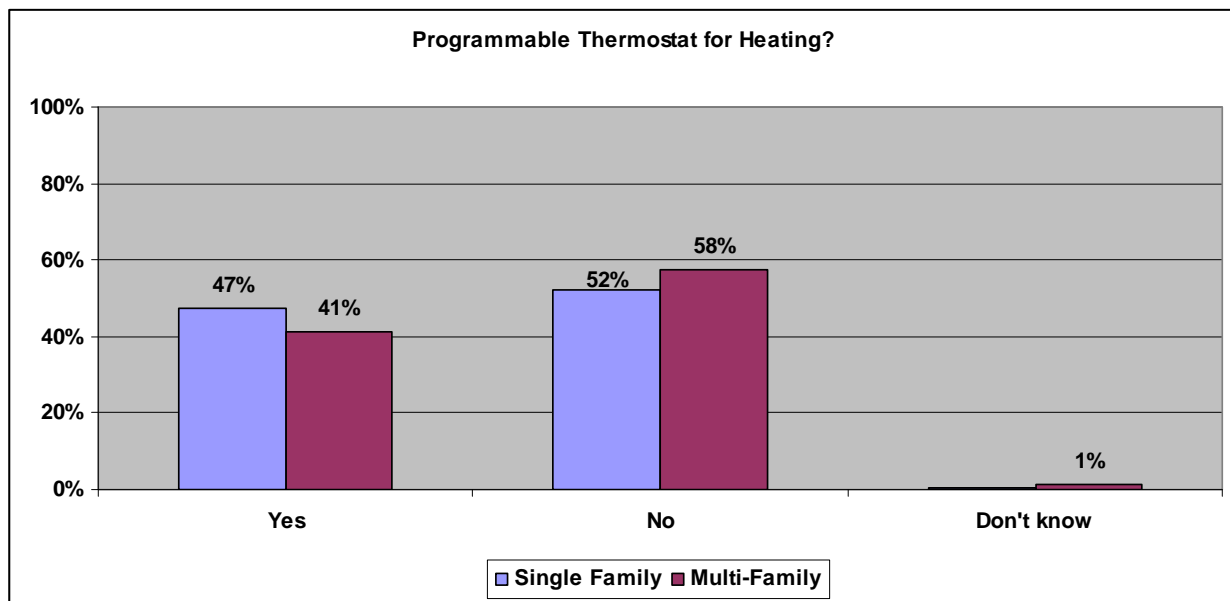


Slightly less than half of respondents (46%) report using a programmable thermostat for heating. The installation and/or greater usage of programmable thermostats represent an easy route to increase energy savings and incentives for this device are advisable and cost-effective.

Table 3-69: Programmable Thermostat for Heating

<i>Do you use a programmable thermostat for your main heating system?</i>	<i>Single Family</i>		<i>Multi-Family</i>		<i>Total</i>	
	<i>N</i>	<i>SF%</i>	<i>N</i>	<i>MF%</i>	<i>N</i>	<i>%</i>
Yes	102	47%	30	41%	132	46%
No	112	52%	42	58%	154	53%
Don't know	1	0%	1	1%	2	1%
Total	215	100%	73	100%	288	100%

Figure 3-71: Programmable Thermostat for Heating

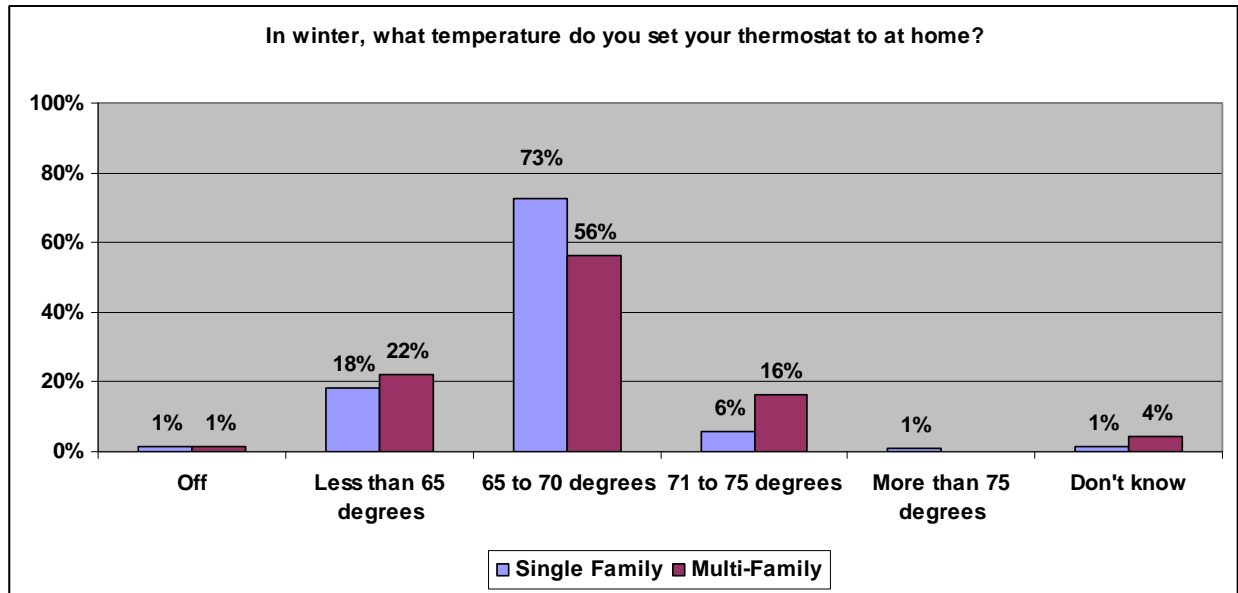


The majority of respondents (68%) report setting a temperature of 65 to 70 degrees during the winter. Almost one in five respondents (19%) indicate keeping the temperature set at less than 65 degrees during this time.

Table 3-70: Winter Temperature Settings

<i>In the winter, what temperature do you typically set your thermostat to when you are home?</i>	<i>Single Family</i>		<i>Multi-Family</i>		<i>Total</i>	
	<i>N</i>	<i>SF%</i>	<i>N</i>	<i>MF%</i>	<i>N</i>	<i>%</i>
Off	3	1%	1	1%	4	1%
Less than 65 degrees	39	18%	16	22%	55	19%
65 to 70 degrees	156	73%	41	56%	197	68%
71 to 75 degrees	12	6%	12	16%	24	8%
More than 75 degrees	2	1%	0	0%	2	1%
Don't know	3	1%	3	4%	6	2%
Total	215	100%	73	100%	288	100%

Figure 3-72: Winter Temperature Settings

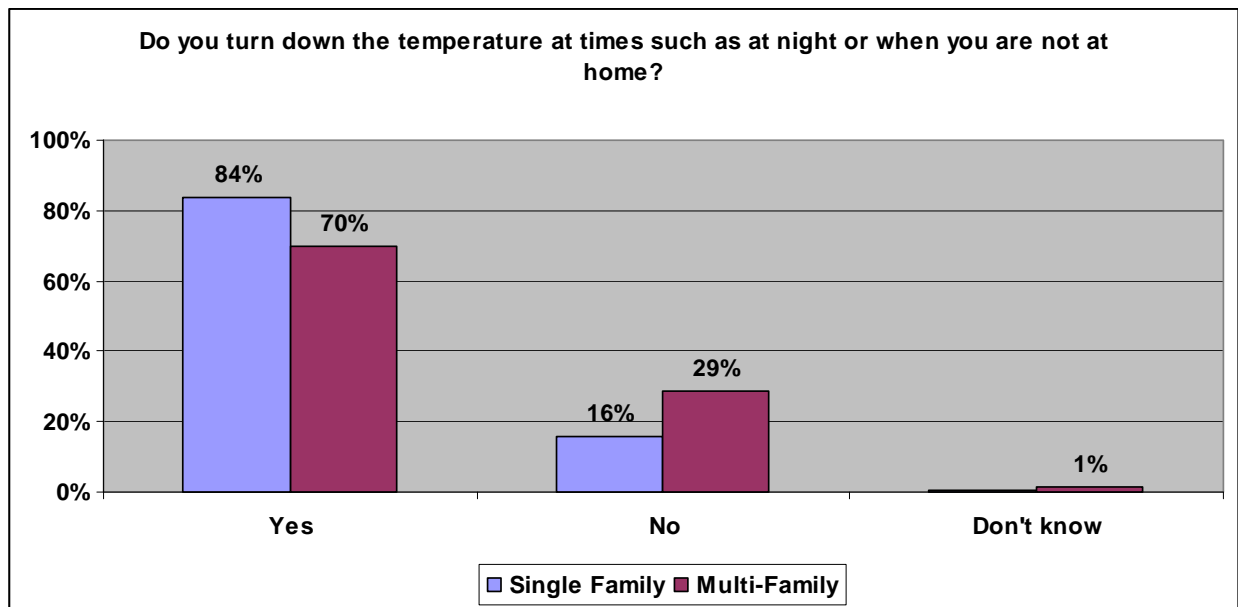


The majority of respondents (80%) report they typically turn down the heat at night or when they are not at home which can be seen as an indicator of an increased energy consciousness among the population during the winter months. In light of this data, incentives for programmable thermostats are an advisable option to further increase energy efficiency.

Table 3-71: Heating at Night or Not Home

<i>Do you turn down the temperature at times such as at night or when you are not at home?</i>	<i>Single Family</i>		<i>Multi-Family</i>		<i>Total</i>	
	<i>N</i>	<i>SF%</i>	<i>N</i>	<i>MF%</i>	<i>N</i>	<i>%</i>
Yes	180	84%	51	70%	231	80%
No	34	16%	21	29%	55	19%
Don't know	1	0%	1	1%	2	1%
Total	215	100%	73	100%	288	100%

Figure 3-73: Heating at Night or Not Home

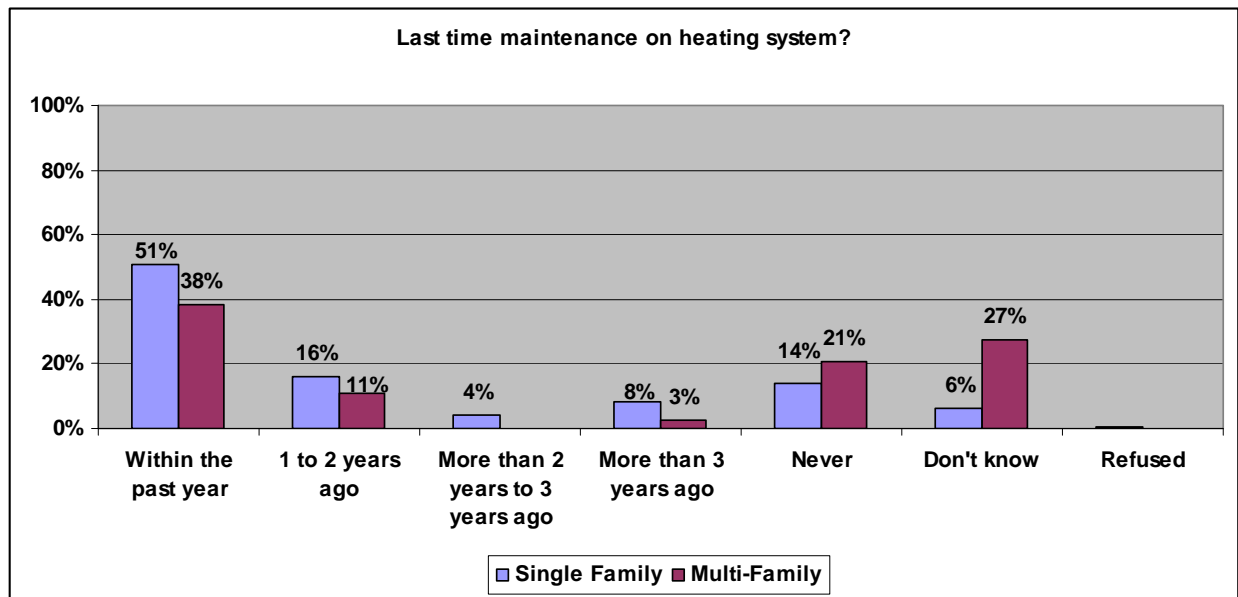


While nearly half of respondents (48%) report they had maintenance performed on their heating system the past year, nearly a fifth of residents surveyed (16%) report never having had any maintenance done. Single family respondents appear to be more aware of their heating system maintenance (only 6% report not knowing last time maintenance was conducted) than multi-family respondents (27% indicate not knowing).

Table 3-72: Heating System Maintenance

<i>When was the last time you had maintenance done on your main heating system?</i>	<i>Single Family</i>		<i>Multi-Family</i>		<i>Total</i>	
	<i>N</i>	<i>SF%</i>	<i>N</i>	<i>MF%</i>	<i>N</i>	<i>%</i>
Within the past year	109	51%	28	38%	137	48%
1 to 2 years ago	35	16%	8	11%	43	15%
More than 2 years to 3 years ago	9	4%	0	0%	9	3%
More than 3 years ago	18	8%	2	3%	20	7%
Never	30	14%	15	21%	45	16%
Don't know	13	6%	20	27%	33	11%
Refused	1	0%	0	0%	1	0%
Total	215	100%	73	100%	288	100%

Figure 3-74: Heating System Maintenance

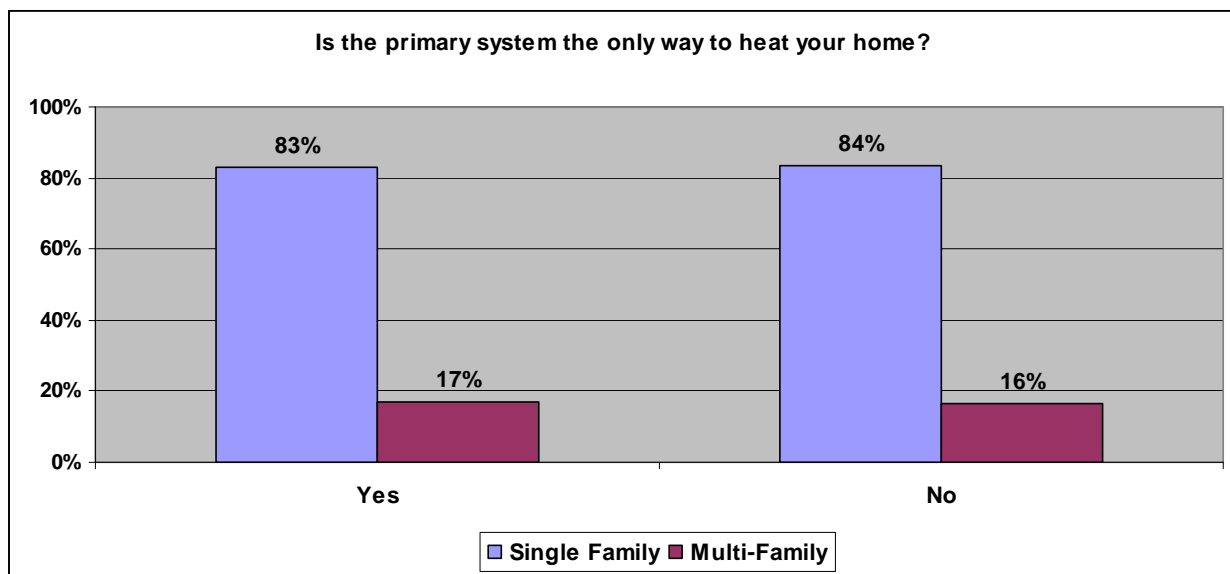


The majority of respondents (83%) report their primary heating system is the only means they use to heat their home. However, close to a fifth of respondents (17%) indicate they have more than one way to heat their home.

Table 3-73: Primary Heating Systems

<i>Is this system we've been talking about the only way to heat your home?</i>	<i>Single Family</i>		<i>Multi-Family</i>		<i>Total</i>	
	<i>N</i>	<i>SF%</i>	<i>N</i>	<i>MF%</i>	<i>N</i>	<i>%</i>
Yes	179	83%	61	84%	240	83%
No	36	17%	12	16%	48	17%
Total	215	100%	73	100%	288	100%

Figure 3-75: Primary Heating Systems

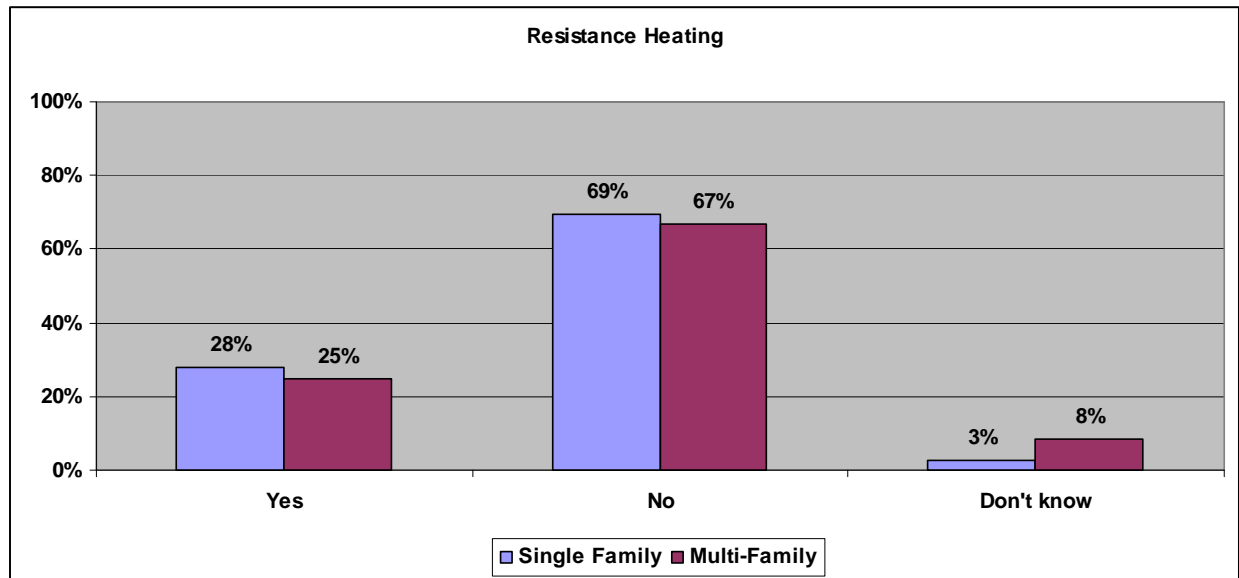


Over a quarter of respondents (27%) report they own some form of resistance heating in their home.

Table 3-74: Resistance Heating

<i>Resistance (baseboard/ceiling/floor/wall)</i>	<i>Single Family</i>		<i>Multi-Family</i>		<i>Total</i>	
	<i>N</i>	<i>SF%</i>	<i>N</i>	<i>MF%</i>	<i>N</i>	<i>%</i>
Yes	10	28%	3	25%	13	27%
No	25	69%	8	67%	33	69%
Don't know	1	3%	1	8%	2	4%
Total	36	100%	12	100%	48	100%

Figure 3-76: Resistance Heating

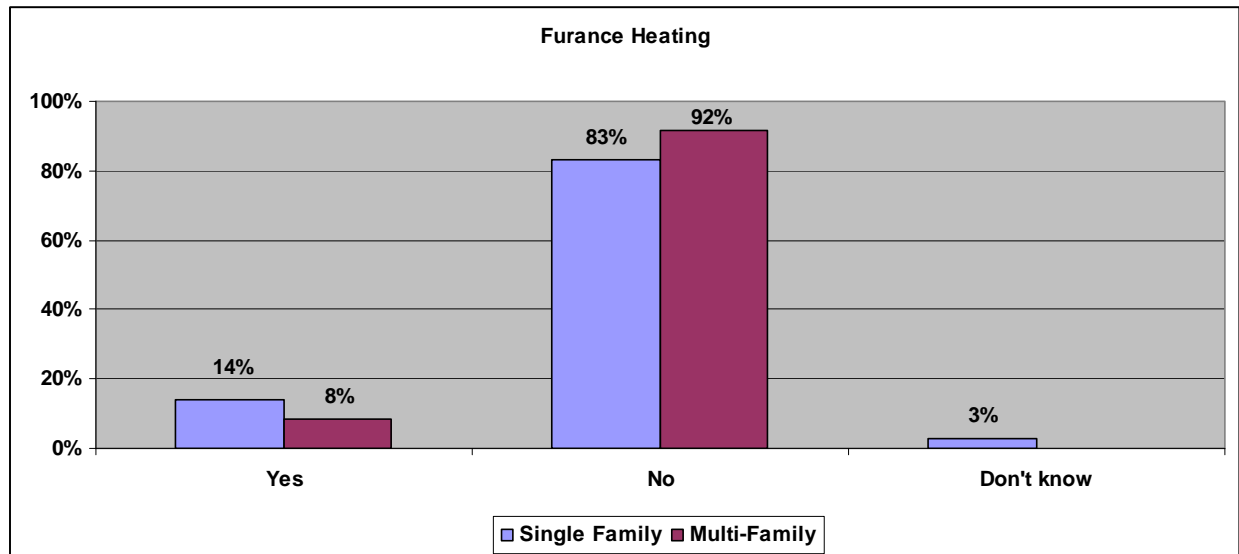


For respondents who make use of secondary heating (n=48), 13% report they own furnace heating.

Table 3-75: Furnace Heating

<i>Furnace (central forced air furnace)</i>	<i>Single Family</i>		<i>Multi-Family</i>		<i>Total</i>	
	<i>N</i>	<i>SF%</i>	<i>N</i>	<i>MF%</i>	<i>N</i>	<i>%</i>
Yes	5	14%	1	8%	6	13%
No	30	83%	11	92%	41	85%
Don't know	1	3%	0	0%	1	2%
Total	36	100%	12	100%	48	100%

Figure 3-77: Furnace Heating

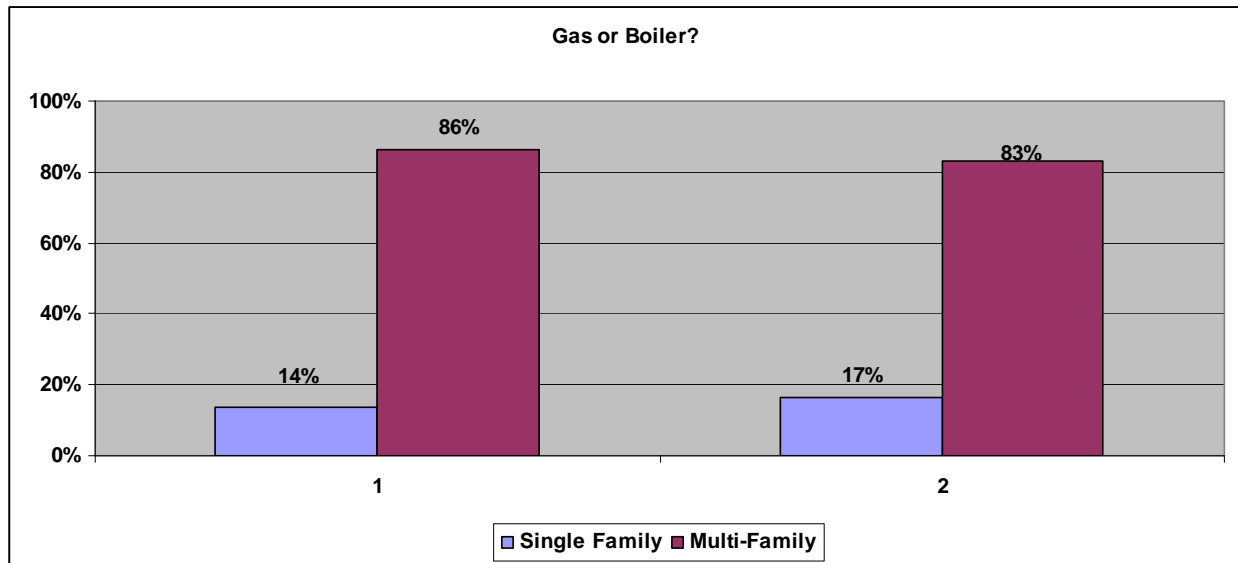


For respondents who make use of secondary heating (n=48), 15% report they use gas or boiler to heat their home.

Table 3-76: Gas or Boiler

<i>Gas or oil boiler</i>	<i>Single Family</i>		<i>Multi-Family</i>		<i>Total</i>	
	<i>N</i>	<i>SF%</i>	<i>N</i>	<i>MF%</i>	<i>N</i>	<i>%</i>
Yes	5	14%	2	17%	7	15%
No	31	86%	10	83%	41	85%
Total	36	100%	12	100%	48	100%

Figure 3-78: Gas or Boiler

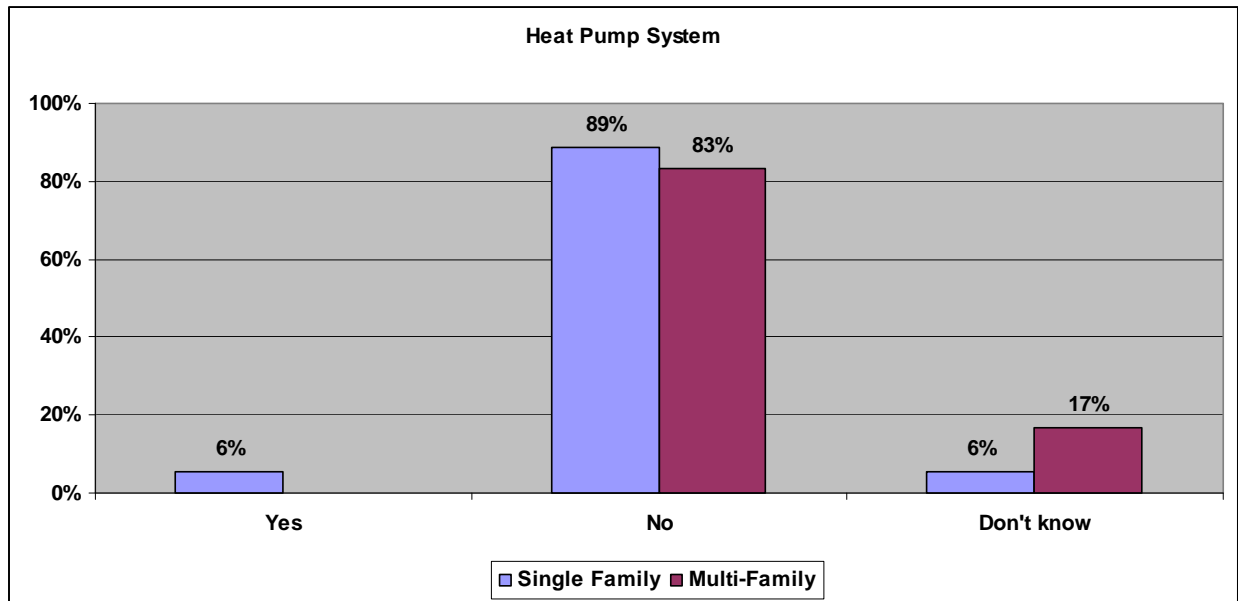


For respondents who make use of secondary heating (n=48), very few (4%) report using a heat pump system.

Table 3-77: Heat Pump System

<i>Heat pump system</i>	<i>Single Family</i>		<i>Multi-Family</i>		<i>Total</i>	
	<i>N</i>	<i>SF%</i>	<i>N</i>	<i>MF%</i>	<i>N</i>	<i>%</i>
Yes	2	6%	0	0%	2	4%
No	32	89%	10	83%	42	88%
Don't know	2	6%	2	17%	4	8%
Total	36	100%	12	100%	48	100%

Figure 3-79: Heat Pump System

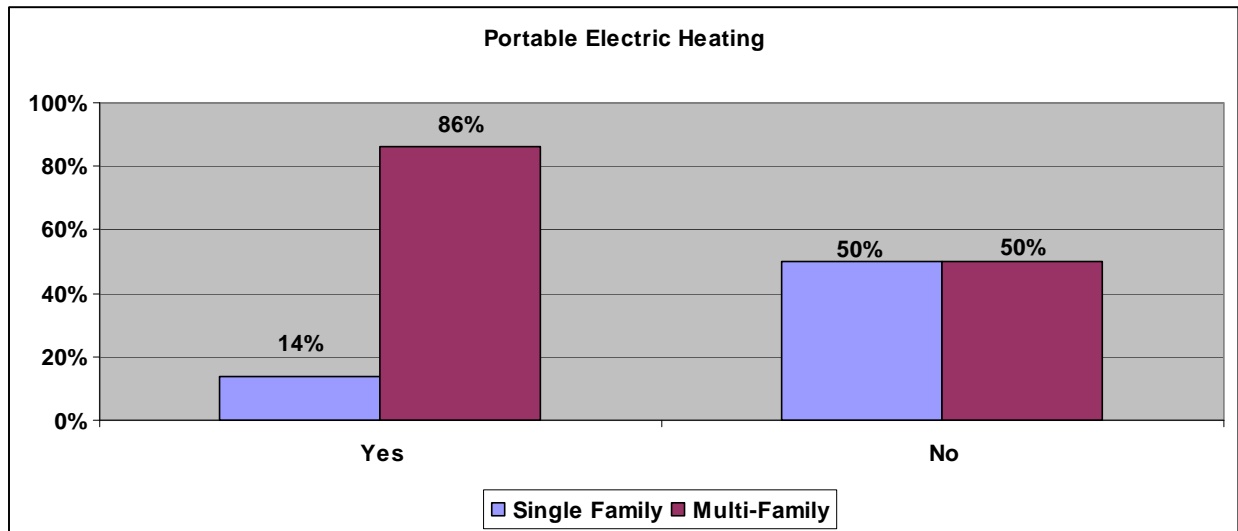


For respondents who make use of secondary heating (n=48), slightly over a fifth of respondents (23%) report they own a portable electric heater.

Table 3-78: Portable Electric Heating

<i>Portable electric heaters</i>	<i>Single Family</i>		<i>Multi-Family</i>		<i>Total</i>	
	<i>N</i>	<i>SF%</i>	<i>N</i>	<i>MF%</i>	<i>N</i>	<i>%</i>
Yes	5	14%	6	50%	11	23%
No	31	86%	6	50%	37	77%
Total	36	100%	12	100%	48	100%

Figure 3-80: Portable Electric Heating



No respondents report using kerosene heating.

Table 3-79: Kerosene Heating

<i>Kerosene heater</i>	<i>Single Family</i>		<i>Multi-Family</i>		<i>Total</i>	
	<i>N</i>	<i>SF%</i>	<i>N</i>	<i>MF%</i>	<i>N</i>	<i>%</i>
No	36	100%	12	100%	48	100%
Total	36	100%	12	100%	48	100%

For respondents who make use of secondary heating (n=48), virtually none (2%) report using a fixed gas space heater.

Table 3-80: Fixed gas space heater

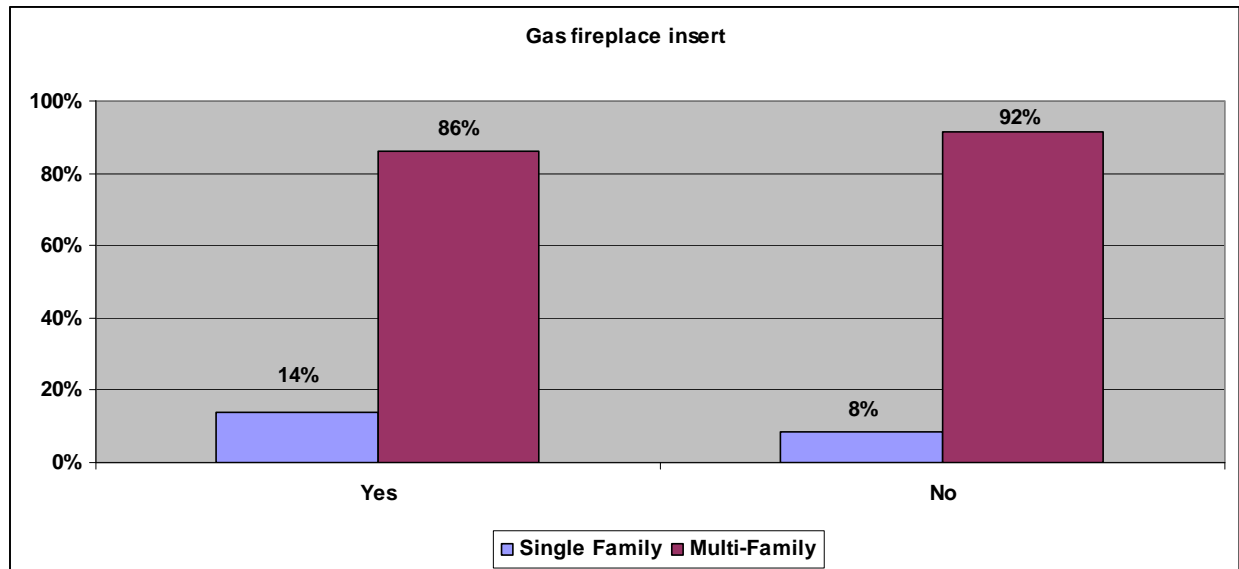
<i>Fixed gas space heater</i>	<i>Single Family</i>		<i>Multi-Family</i>		<i>Total</i>	
	<i>N</i>	<i>SF%</i>	<i>N</i>	<i>MF%</i>	<i>N</i>	<i>%</i>
Yes	1	3%	0	0%	1	2%
No	35	97%	12	100%	47	98%
Total	36	100%	12	100%	48	100%

For respondents who make use of secondary heating (n=48), 14% report they own a gas fireplace insert.

Table 3-81: Gas Fireplace insert

<i>Gas fireplace insert</i>	<i>Single Family</i>		<i>Multi-Family</i>		<i>Total</i>	
	<i>N</i>	<i>SF%</i>	<i>N</i>	<i>MF%</i>	<i>N</i>	<i>%</i>
Yes	5	14%	1	8%	6	13%
No	31	86%	11	92%	42	88%
Total	36	100%	12	100%	48	100%

Figure 3-81: Gas fireplace insert

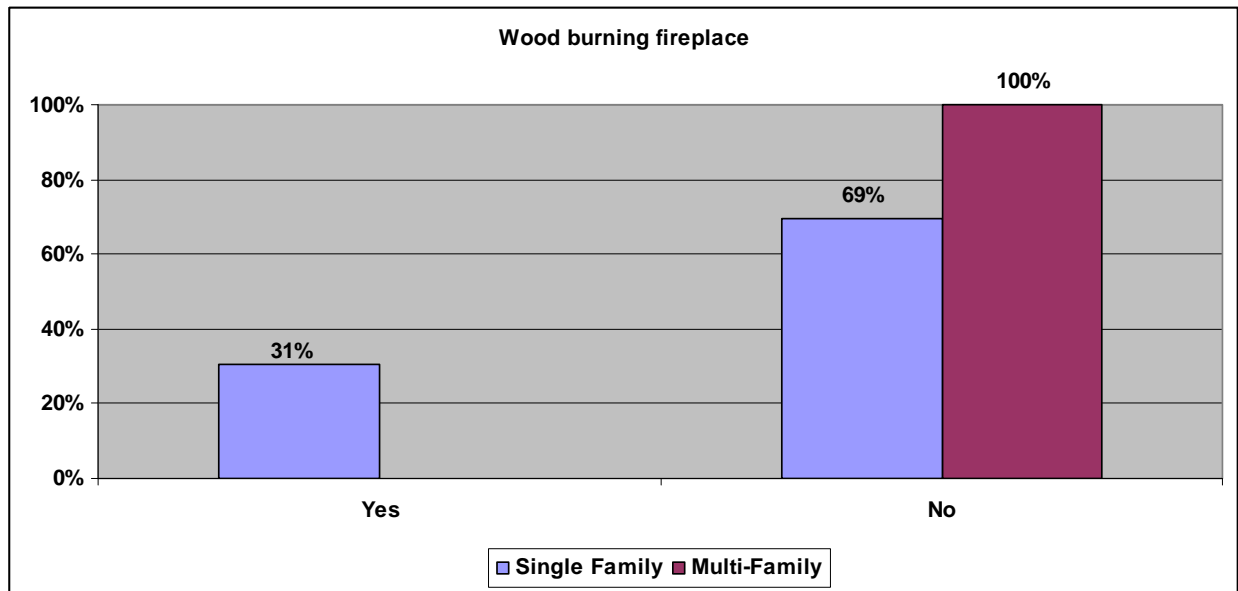


For respondents who make use of secondary heating (n=48), wood burning fireplaces appear to be prevalent in single family homes (31%), but not in multi-family locations.

Table 3-82: Wood burning fireplace

<i>Wood burning fireplace</i>	<i>Single Family</i>		<i>Multi-Family</i>		<i>Total</i>	
	<i>N</i>	<i>SF%</i>	<i>N</i>	<i>MF%</i>	<i>N</i>	<i>%</i>
Yes	11	31%	0	0%	11	23%
No	25	69%	12	100%	37	77%
Total	36	100%	12	100%	48	100%

Figure 3-82: Wood burning fireplace

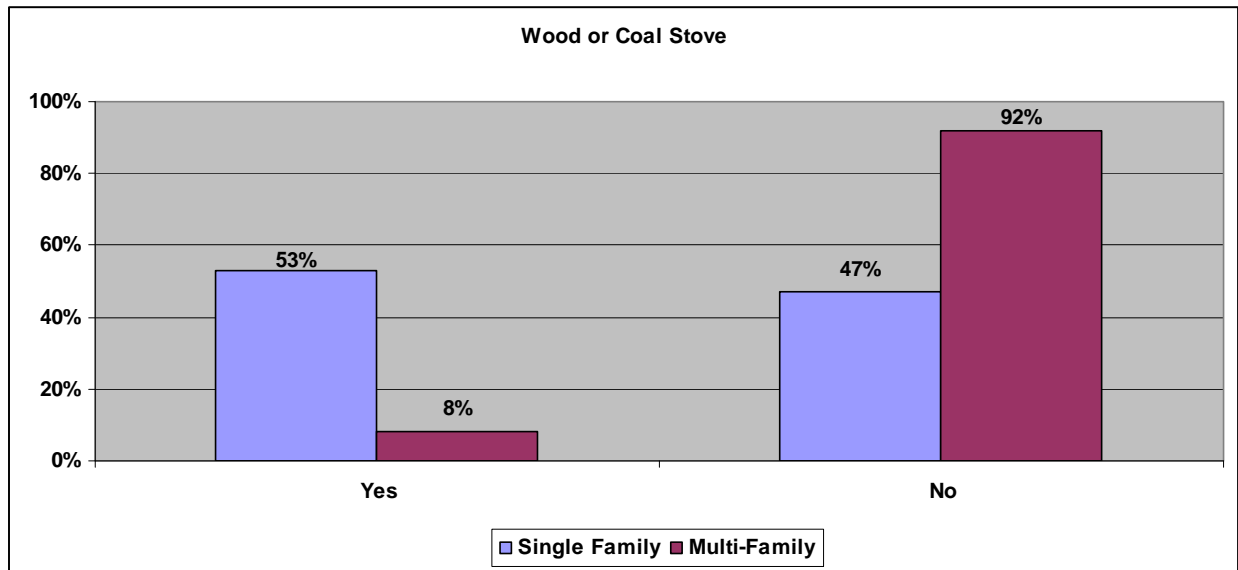


For respondents who make use of secondary heating (n=48), over half of single family homes (53%) own a wood or coal stove, but this is the case in only 8% of multi-family residences.

Table 3-83: Wood or Coal Stove

<i>Wood or coal stove</i>	<i>Single Family</i>		<i>Multi-Family</i>		<i>Total</i>	
	<i>N</i>	<i>SF%</i>	<i>N</i>	<i>MF%</i>	<i>N</i>	<i>%</i>
Yes	19	53%	1	8%	20	42%
No	17	47%	11	92%	28	58%
Total	36	100%	12	100%	48	100%

Figure 3-83: Wood or Coal Stove

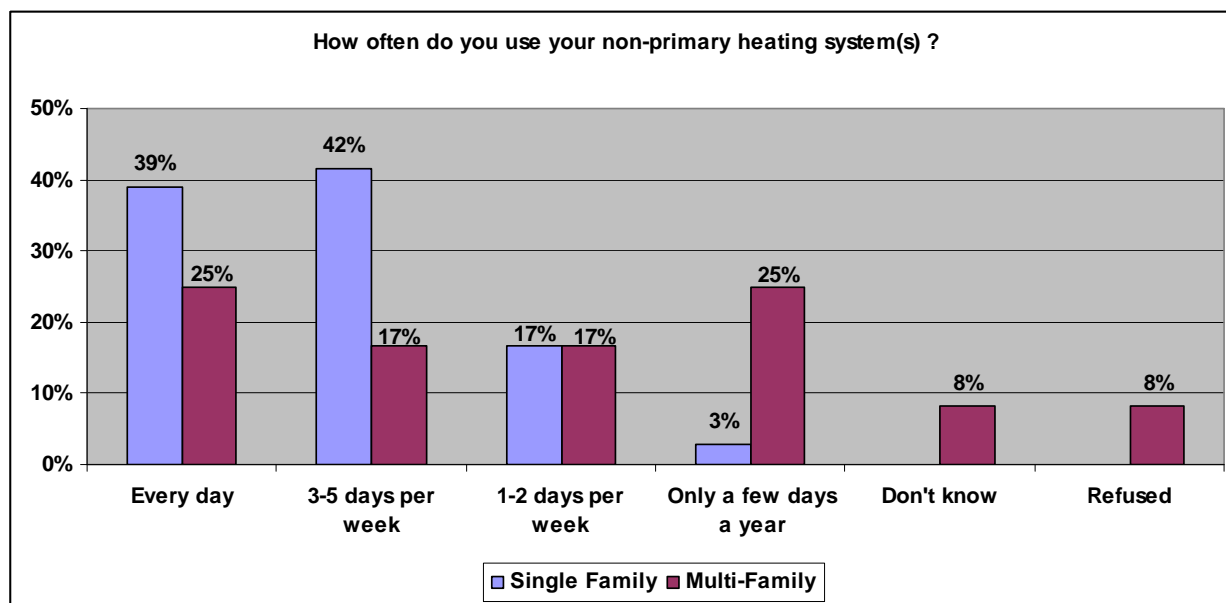


Non-primary heating systems appear to be run frequently. Seventy percent of respondents use their non-primary heating system three or more days a week during the heating season, with 35% using the system every day.

Table 3-84: Non-primary heating system use

<i>Approximately how often do you use your non-primary heating system(s) during the heating season?</i>	<i>Single Family</i>		<i>Multi-Family</i>		<i>Total</i>	
	<i>N</i>	<i>SF%</i>	<i>N</i>	<i>MF%</i>	<i>N</i>	<i>%</i>
Every day	14	39%	3	25%	17	35%
3-5 days per week	15	42%	2	17%	17	35%
1-2 days per week	6	17%	2	17%	8	17%
Only a few days a year	1	3%	3	25%	4	8%
Don't know	0	0%	1	8%	1	2%
Refused	0	0%	1	8%	1	2%
Total	36	100%	12	100%	48	100%

Figure 3-84: Non-primary heating system use

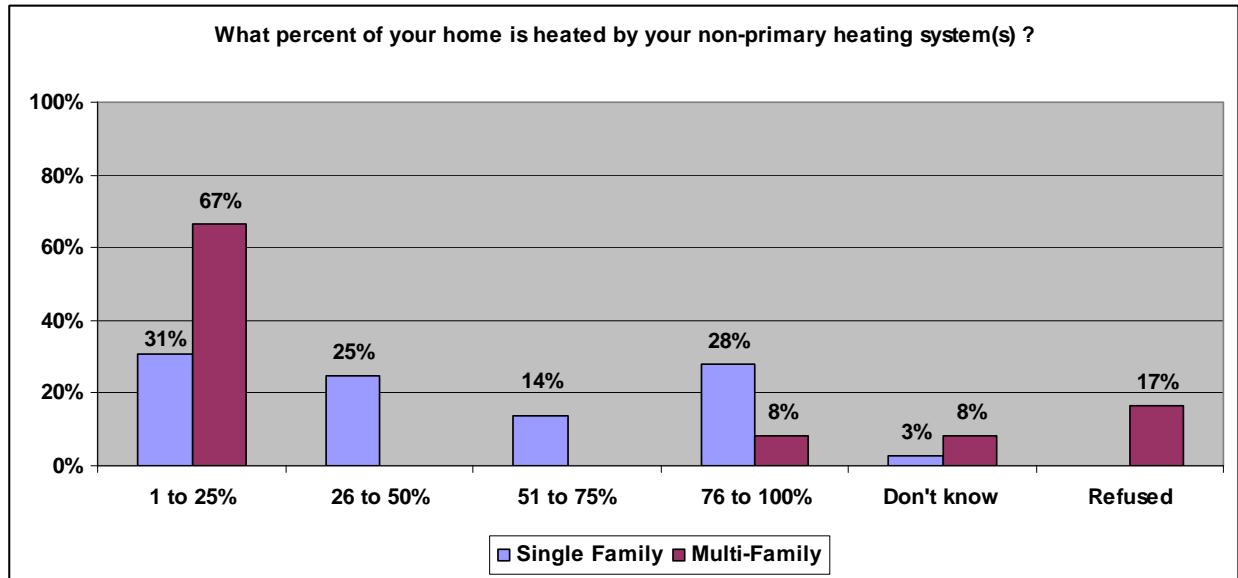


In terms of the area of a home heated by non-primary systems, responses differ by house type. Single family respondents report a relatively even distribution of area heated, ranging from a quarter or less of their house to three-quarters or more of their home. In contrast, 67% of multi-family respondents report that their non-primary systems primarily heat a quarter or less of their home.

Table 3-85: Percent of home heated by non-primary system

What percent of your home is heated by your non-primary heating system(s)?	Single Family		Multi-Family		Total	
	N	SF%	N	MF%	N	%
1 to 25%	11	31%	8	67%	19	40%
26 to 50%	9	25%	0	0%	9	19%
51 to 75%	5	14%	0	0%	5	10%
76 to 100%	10	28%	1	8%	11	20%
Don't know	1	3%	1	8%	2	4%
Refused	0	0%	2	17%	2	4%
Total	36	100%	12	100%	48	100%

Figure 3-85: Percent of home heated by non-primary system



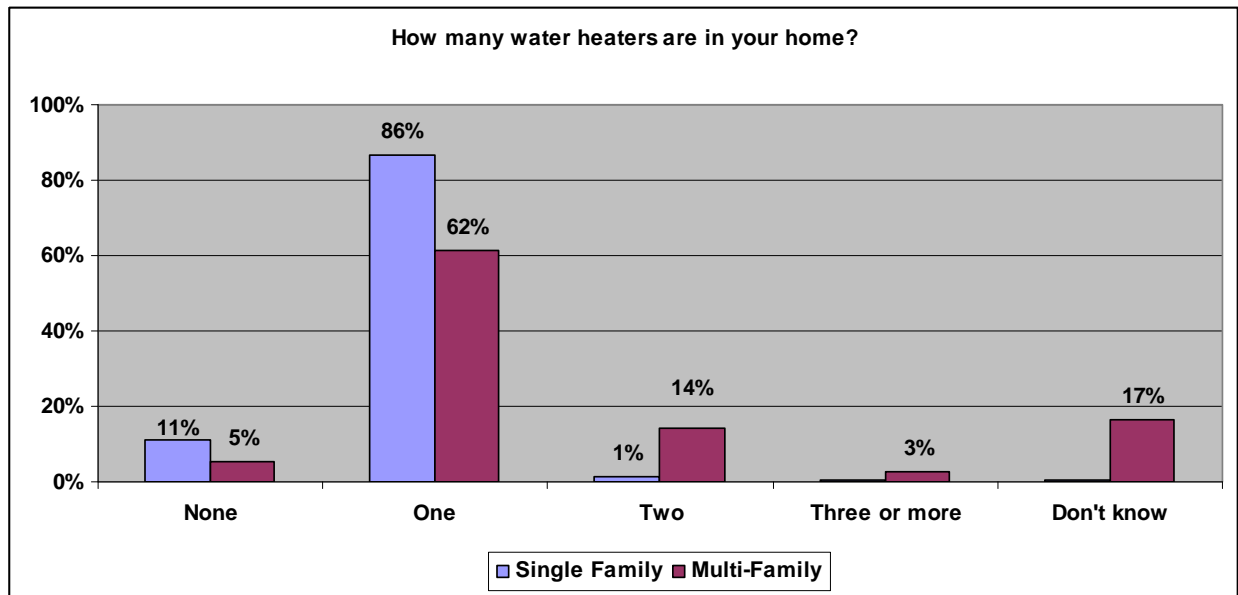
3.7 Water Heating

Respondents were asked to indicate how many water heaters are in their homes. The majority of respondents (80%) have one water heater in their home.

Table 3-86: Quantity of Water Heaters

How many water heaters are in your home?	Single Family		Multi-Family		Total	Total
	N	%	N	%	N	%
None	25	11%	4	5%	29	10%
One	192	86%	48	62%	240	80%
Two	3	1%	11	14%	14	5%
Three or more	1	0%	2	3%	3	1%
Don't know	1	0%	13	17%	14	5%
Total	222	100%	78	100%	300	100%

Figure 3-86: Quantity of Water Heaters

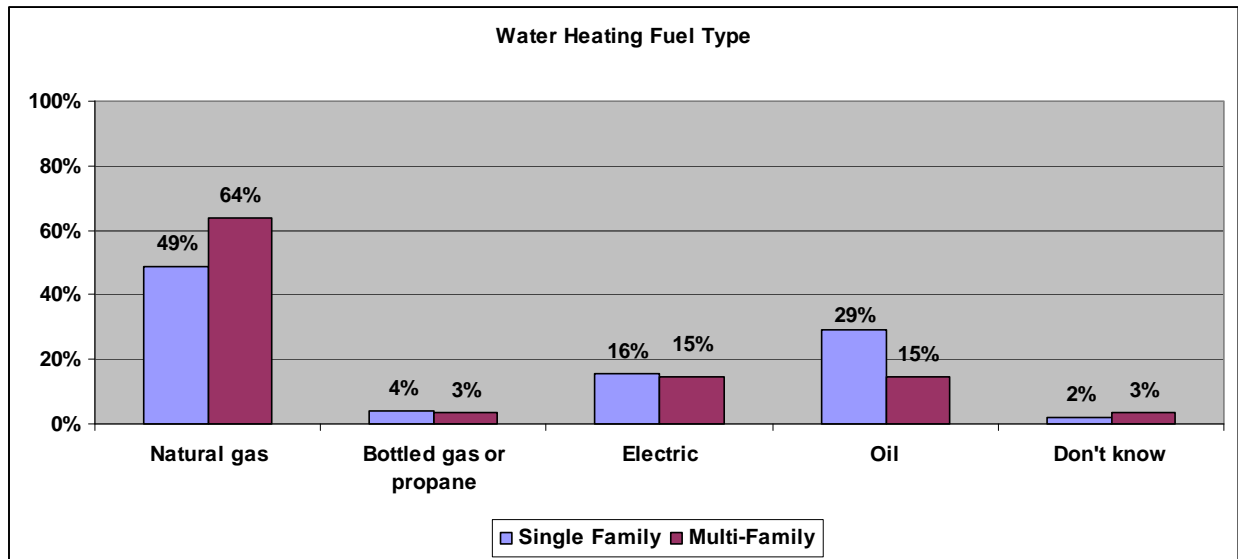


Respondents were asked to indicate the main fuel source for heating hot water in their homes. Similar to the fuel source used for space heating, the top three fuel sources to heat water are natural gas, oil and electricity.

Table 3-87: Water Heating Fuel Type

What is the main type of fuel you use to heat water in your home?	Single Family		Multi-Family		Total	Total
	N	%	N	%	N	%
Natural gas	96	49%	39	64%	135	53%
Oil	57	29%	9	15%	66	26%
Electric	31	16%	9	15%	40	16%
Bottled gas or propane	8	4%	2	3%	10	4%
Don't know	4	2%	2	3%	6	2%
Total	196	100%	61	100%	257	100%

Figure 3-87: Water Heating Fuel Type

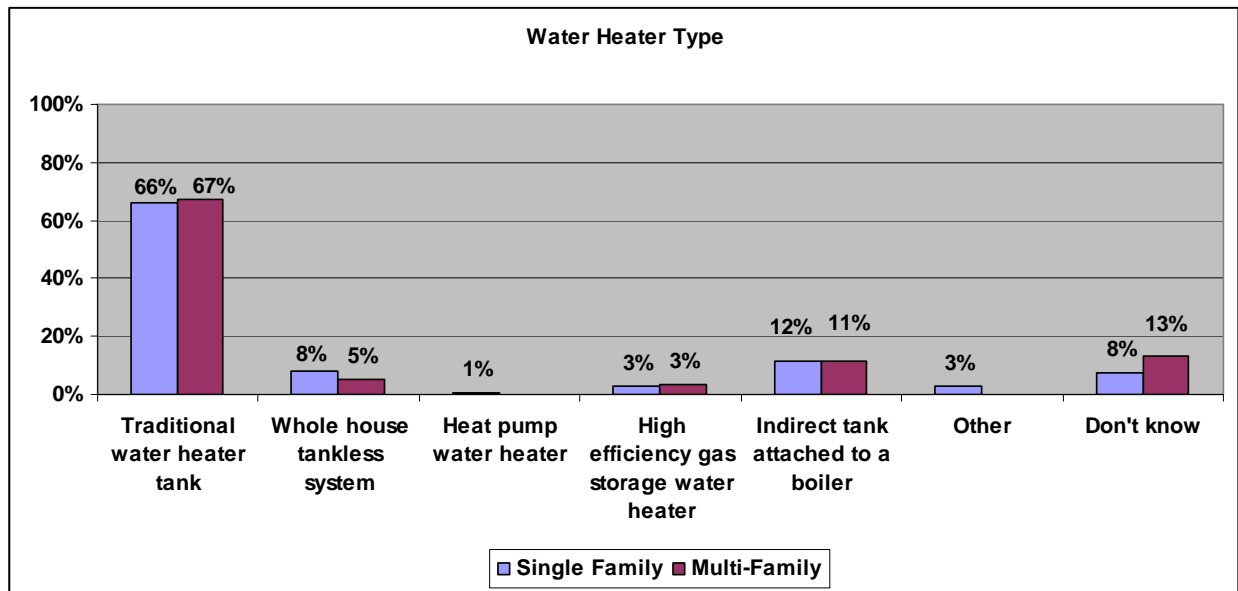


In an effort to profile the types of water heating systems in use, customers with water heaters were asked to identify the type of system in their homes. Traditional water heater tanks represent two-thirds of water heating systems installed.

Table 3-88: Water Heater Type

<i>What type of system is your main water heater? Would you say it is a...</i>	Single Family		Multi-Family		Total	Total
	N	%	N	%	N	%
Traditional water heater tank	129	66%	41	67%	170	66%
Indirect tank attached to a boiler	23	12%	7	11%	30	12%
Whole house tankless system	16	8%	3	5%	19	7%
High efficiency gas storage water heater	6	3%	2	3%	8	3%
Heat pump water heater	1	1%	0	0%	1	0%
Other	6	3%	0	0%	6	2%
Don't know	15	8%	8	13%	23	9%
Total	196	100%	61	100%	257	100%

Figure 3-88: Water Heater Type

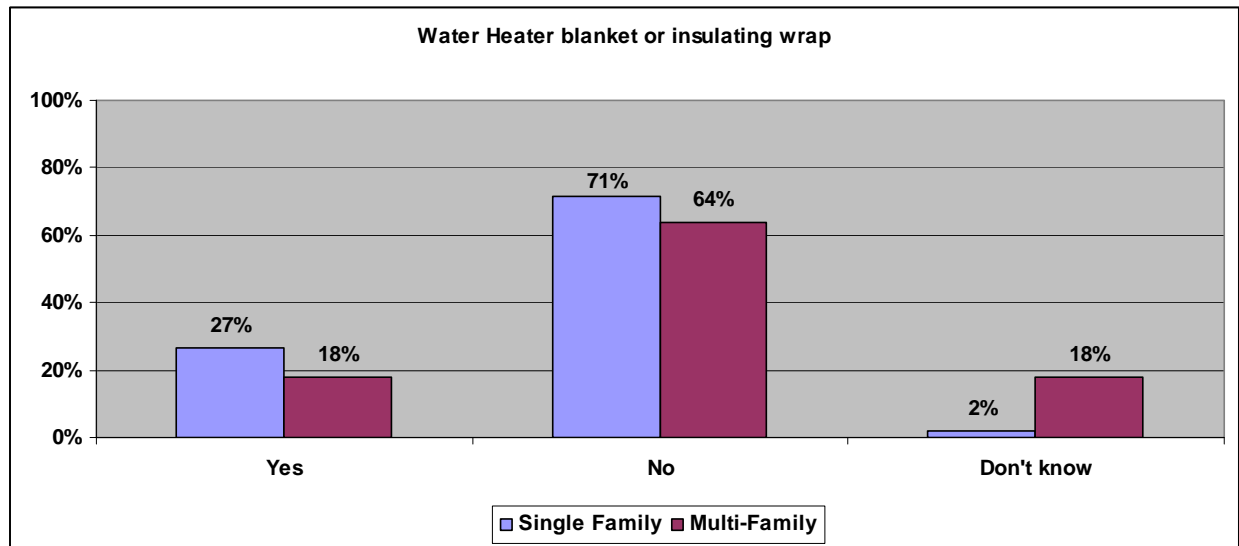


Respondents with water heaters were asked if they have an insulating wrap or blanket around their system. With only 25% of residential customers reporting making use of wraps or blankets, there is room for improvement.

Table 3-89: Incidence of Insulating Wrap or Blankets Around Hot Water Heaters

<i>Do you have an insulating wrap or blanket around your hot water heater?</i>	Single Family		Multi-Family		Total	Total
	N	%	N	%	N	%
Yes	52	27%	11	18%	63	25%
No	140	71%	39	64%	179	70%
Don't know	4	2%	11	18%	15	6%
Total	196	100%	61	100%	257	100%

Figure 3-89: Incidence of Insulating Wrap or Blankets Around Hot Water Heaters

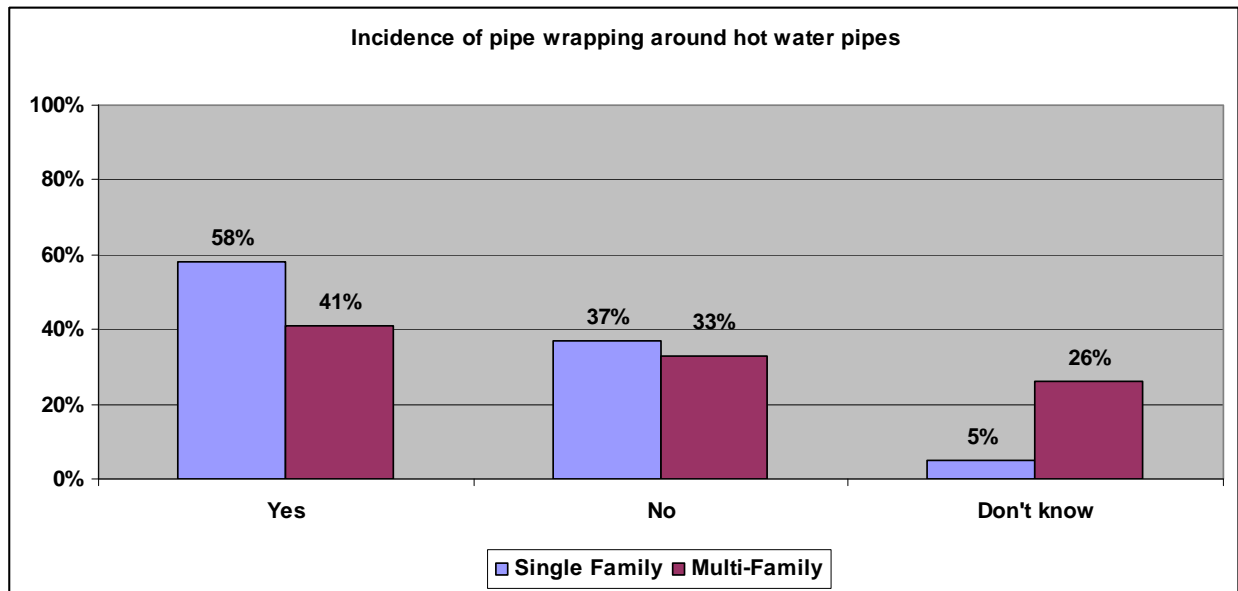


Customers with water heaters were asked if they have pipe wrapping around their hot water pipes. Even though 54% report making use of pipe wrapping, there is still room for improvement.

Table 3-90: Incidence of Pipe Wrapping Around Hot Water Pipes

<i>Do you have pipe wrapping around your hot water pipes?</i>	Single Family		Multi-Family		Total	Total
	N	%	N	%	N	%
Yes	114	58%	25	41%	139	54%
No	72	37%	20	33%	92	36%
Don't know	10	5%	16	26%	26	10%
Total	196	100%	61	100%	257	100%

Figure 3-90: Incidence of Pipe Wrapping Around Hot Water Pipes

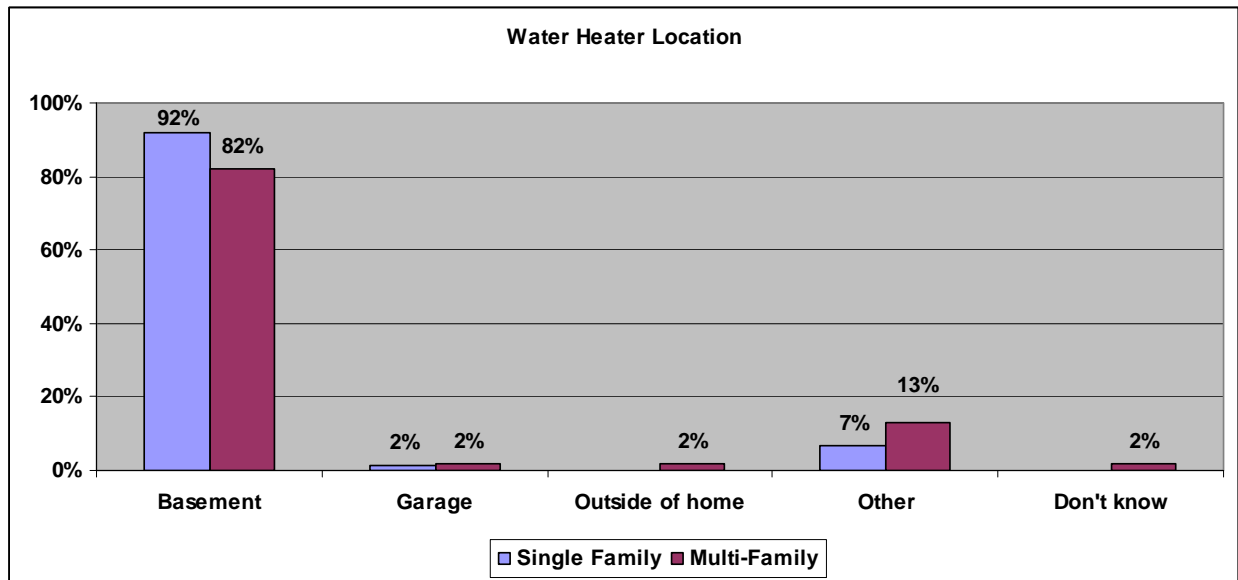


Most customers have their hot water heater located in their basement.

Table 3-91: Location of Hot Water Heater

<i>Where is your hot water heater located?</i>	Single Family		Multi-Family		Total	Total
	N	%	N	%	N	%
Basement	180	92%	50	82%	230	89%
Garage	3	2%	1	2%	4	2%
Outside of home	0	0%	1	2%	1	0%
Other	13	7%	8	13%	21	8%
Don't know	0	0%	1	2%	1	0%
Total	196	100%	61	100%	257	100%

Figure 3-91: Location of Hot Water Heater

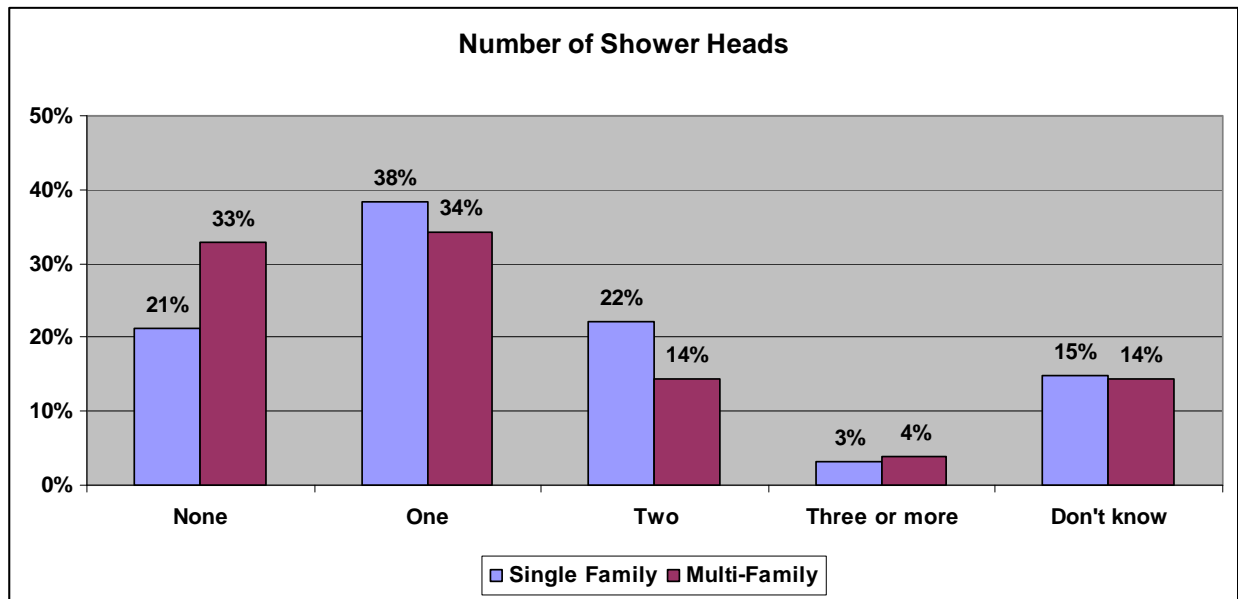


Respondents were asked to indicate the number of shower heads and sinks in their homes. Single family customers indicate a much higher percentage of two or more shower heads (50%) compared to multi-family residents (27%).

Table 3-92: Quantity of Shower Heads

How many shower heads are in your home?	Single Family		Multi-Family		Total	Total
	N	%	N	%	N	%
1	1	0%	2	3%	3	1%
2	111	50%	55	71%	166	55%
3	93	42%	13	17%	106	35%
4	17	8%	8	10%	25	8%
Total	222	100%	78	100%	300	100%

Figure 3-92: Quantity of Shower Heads

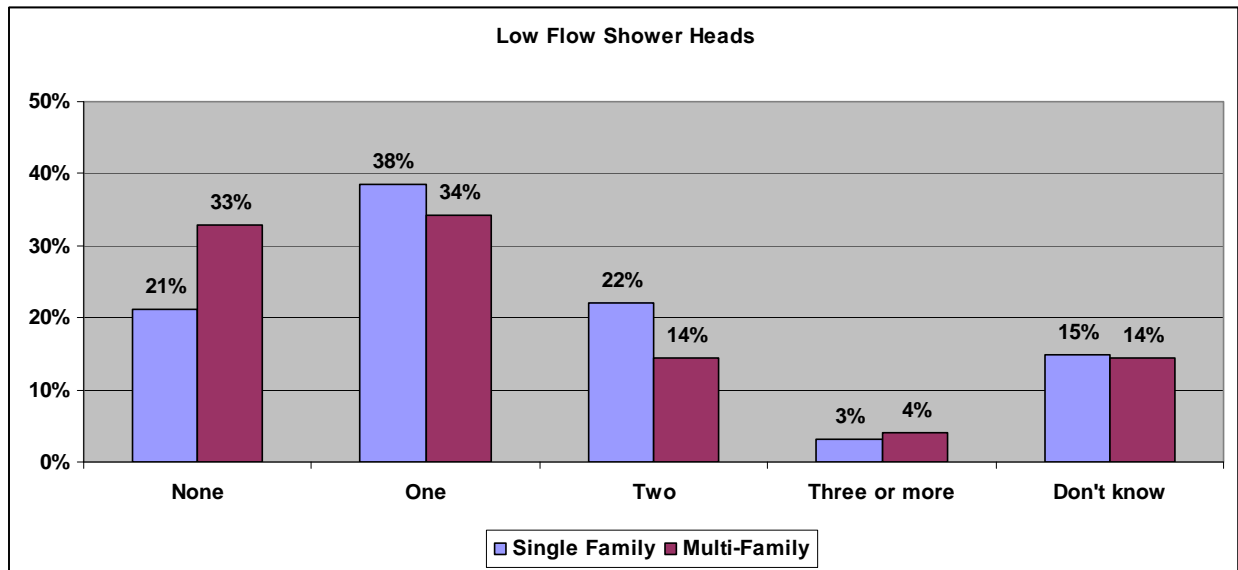


Respondents were then asked about whether or not they had installed low-flow shower heads. Low-flow showerheads use 2.5 gallons or less per minute and have been standard since 1993. Almost a quarter of residents surveyed (24%) reporting not having any low-flow showerheads indicates these devices should be more strongly promoted.

Table 3-93: Quantity of Low-Flow Shower Heads

<i>How many of these are low-flow shower heads?</i>	Single Family		Multi-Family		Total	Total
	N	%	N	%	N	%
None	47	21%	25	33%	72	24%
One	85	38%	26	34%	111	37%
Two	49	22%	11	14%	60	20%
Three or more	7	3%	3	4%	10	3%
Don't know	33	15%	11	14%	44	15%
Total	221	100%	76	100%	297	100%

Figure 3-93: Quantity of Low-Flow Shower Heads

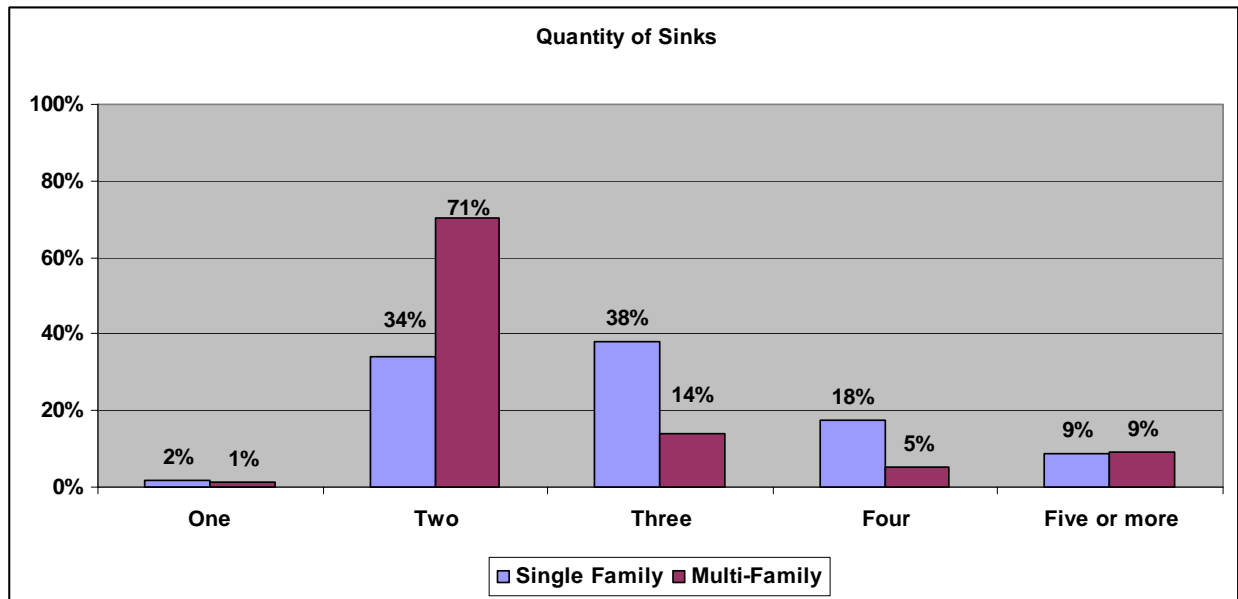


Single family respondents report a higher percentage of three or more sinks in their homes (65%) compared to multi-family respondents (28%).

Table 3-94: Quantity of Sinks

<i>How sinks are in your home?</i>	Single Family		Multi-Family		Total	Total
	N	%	N	%	N	%
One	4	2%	1	1%	5	2%
Two	76	34%	55	71%	131	44%
Three	84	38%	11	14%	95	32%
Four	39	18%	4	5%	43	14%
Five or more	19	9%	7	9%	26	9%
Total	222	100%	78	100%	300	100%

Figure 3-94: Quantity of Sinks

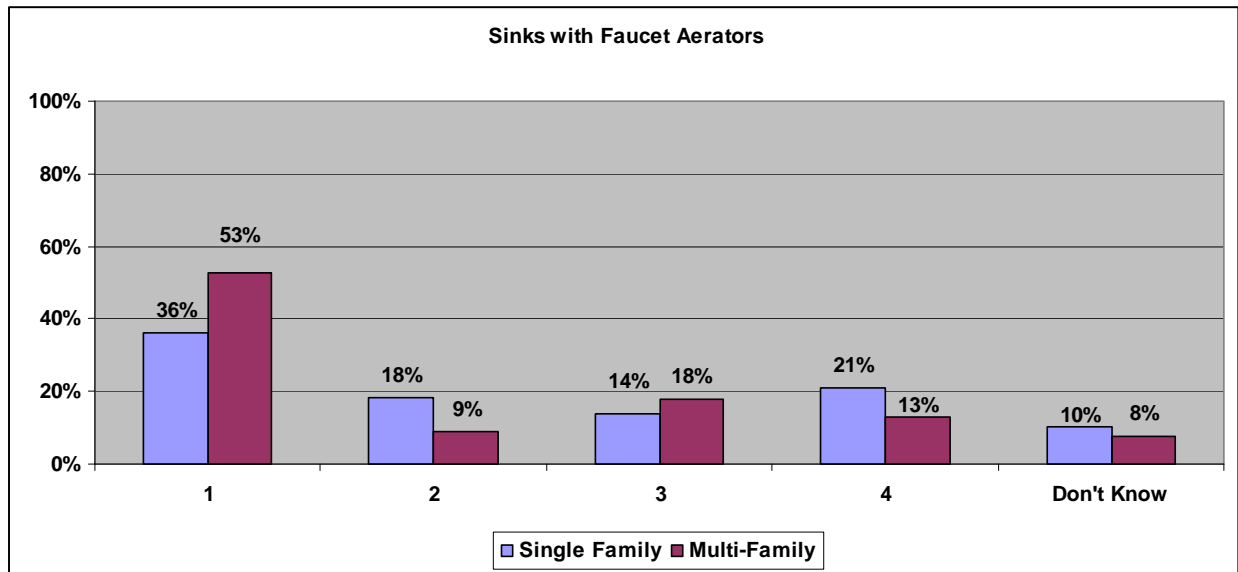


The survey tested for the presence of sinks with faucet aerators and finds that 40% of customers have sinks with no faucet aerators. This indicates these devices should be more strongly promoted.

Table 3-95: Quantity of Sinks with Faucet Aerators

<i>How many of these sinks have a faucet aerator?</i>	Single Family		Multi-Family		Total	Total
	N	%	N	%	N	%
None	80	36%	41	53%	121	40%
One	41	18%	7	9%	48	16%
Two	31	14%	14	18%	45	15%
Three or more	47	21%	10	13%	57	19%
Don't know	23	10%	6	8%	29	10%
Total	222	100%	78	100%	300	100%

Figure 3-95: Quantity of Sinks with Faucet Aerators



3.8 Kitchen Appliances

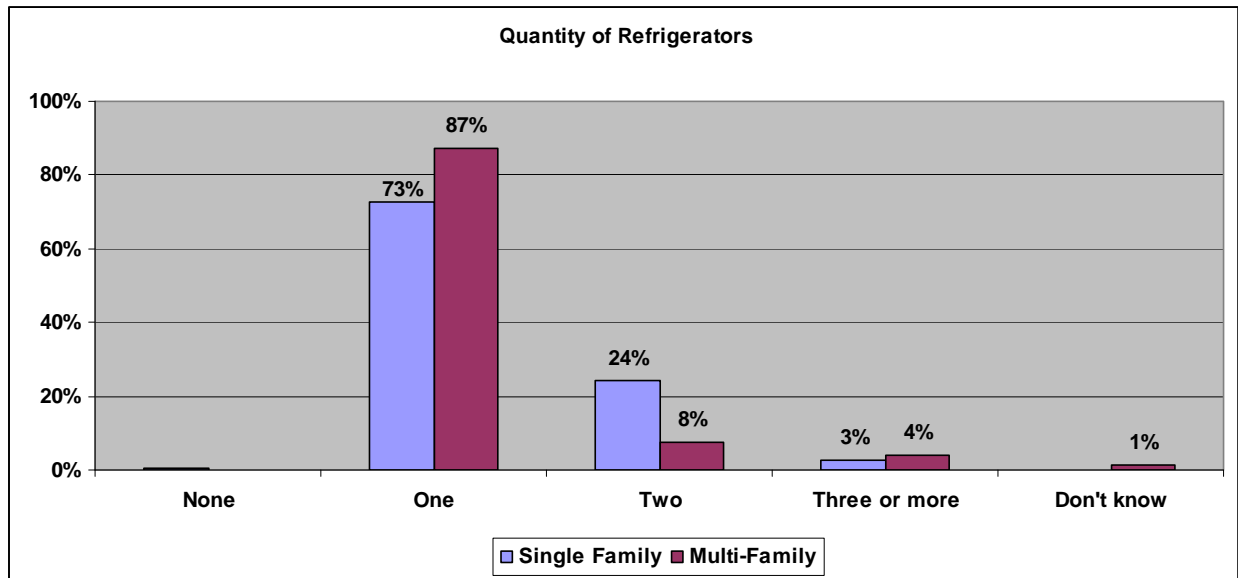
3.8.1 Refrigerators

Respondents were asked to indicate how many refrigerators they use in their home. Most customers (76%) report owning one refrigerator.

Table 3-96: Quantity of Refrigerators

How many refrigerators do you own?	Single Family		Multi-Family		Total	
	N	%	N	%	N	%
None	1	0%	0	0%	1	0%
One	161	73%	68	87%	229	76%
Two	54	24%	6	8%	60	20%
Three or more	6	3%	3	4%	9	3%
Don't know	0	0%	1	1%	1	0%
Total	222	100%	78	100%	300	100%

Figure 3-96: Quantity of Refrigerators

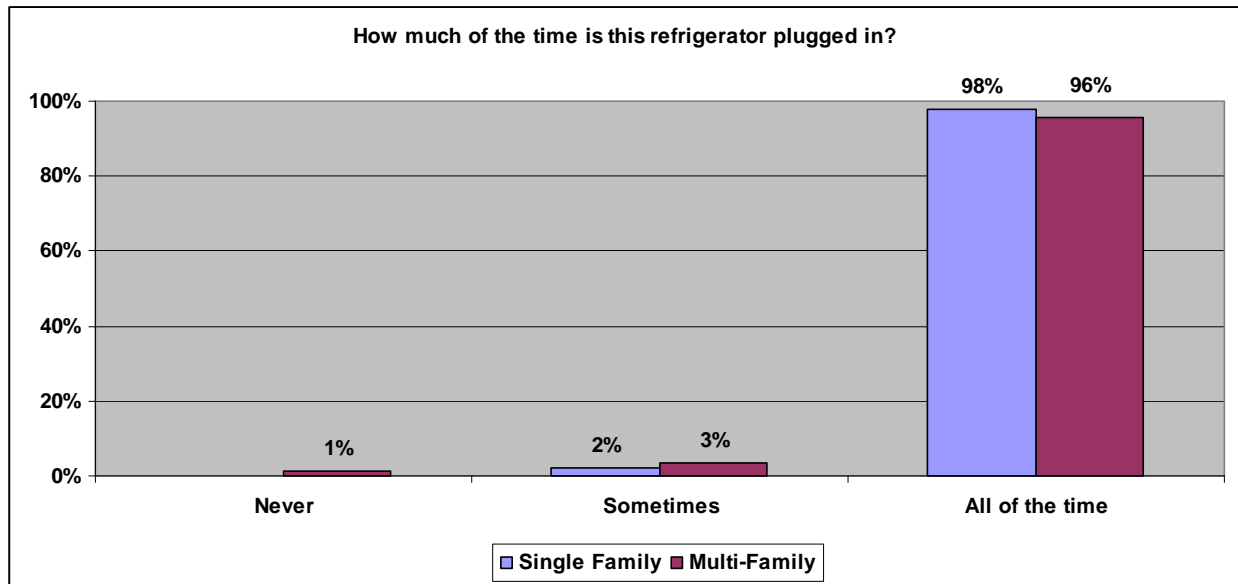


The survey sought to determine how much of the time each refrigerator used by the respondents was plugged in. Respondents overwhelmingly report (97%) that their refrigerator is plugged in all of the time.

Table 3-97: Refrigerator Usage

<i>About how much of the time is this refrigerator plugged in?</i>	<i>Single Family</i>		<i>Multi-Family</i>		<i>Total</i>	
	<i>N</i>	<i>SF%</i>	<i>N</i>	<i>MF%</i>	<i>N</i>	<i>%</i>
Never	0	0%	1	1%	1	0%
Sometimes	6	2%	3	3%	9	2%
All of the time	281	98%	85	96%	366	97%
Total	287	100%	89	100%	376	100%

Figure 3-97: Refrigerator Usage

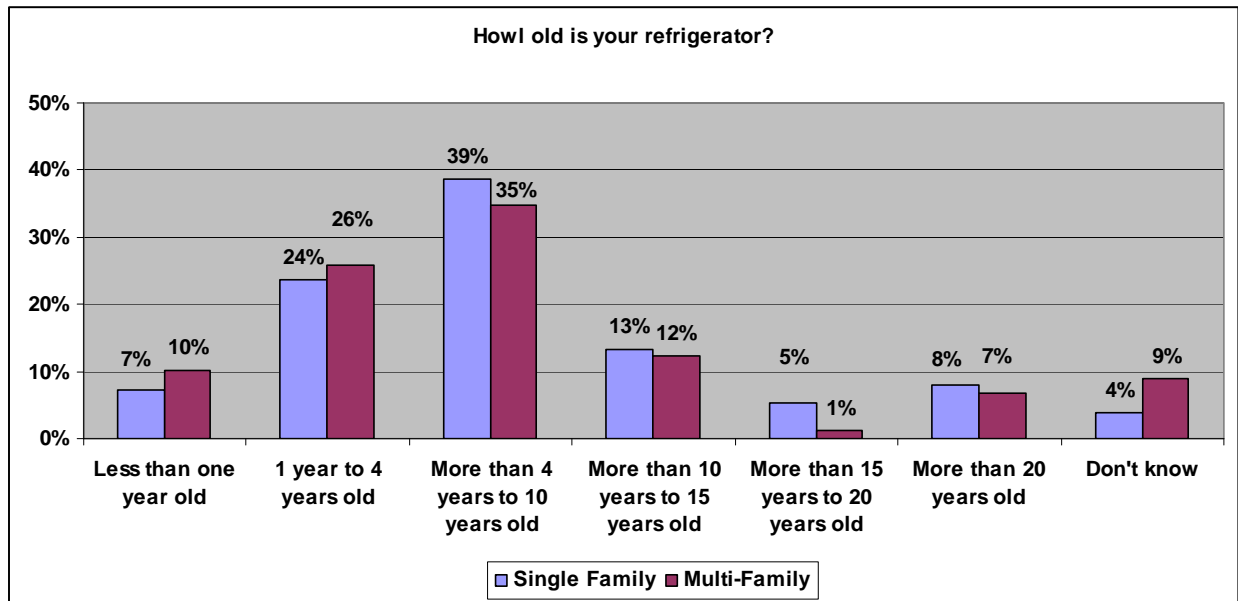


Respondents were asked to indicate the age of the refrigerators they owned. The majority of refrigerators (62%) appear to fall into one of two categories: 1 to 4 years old (24%) and 4 to 10 years old (38%). However, with respondents reporting that a quarter of refrigerators are over 10 years old, there is room for energy efficiency upgrades.

Table 3-98: Age of Refrigerator

How old is this refrigerator?	Single Family		Multi-Family		Total	
	N	SF%	N	MF%	N	%
Less than one year old	21	7%	9	10%	30	8%
1 year to 4 years old	68	24%	23	26%	91	24%
More than 4 years to 10 years old	111	39%	31	35%	142	38%
More than 10 years to 15 years old	38	13%	11	12%	49	13%
More than 15 years to 20 years old	15	5%	1	1%	16	4%
More than 20 years old	23	8%	6	7%	29	8%
Don't know	11	4%	8	9%	19	5%
Total	287	100%	89	100%	376	100%

Figure 3-98: Age of Refrigerator

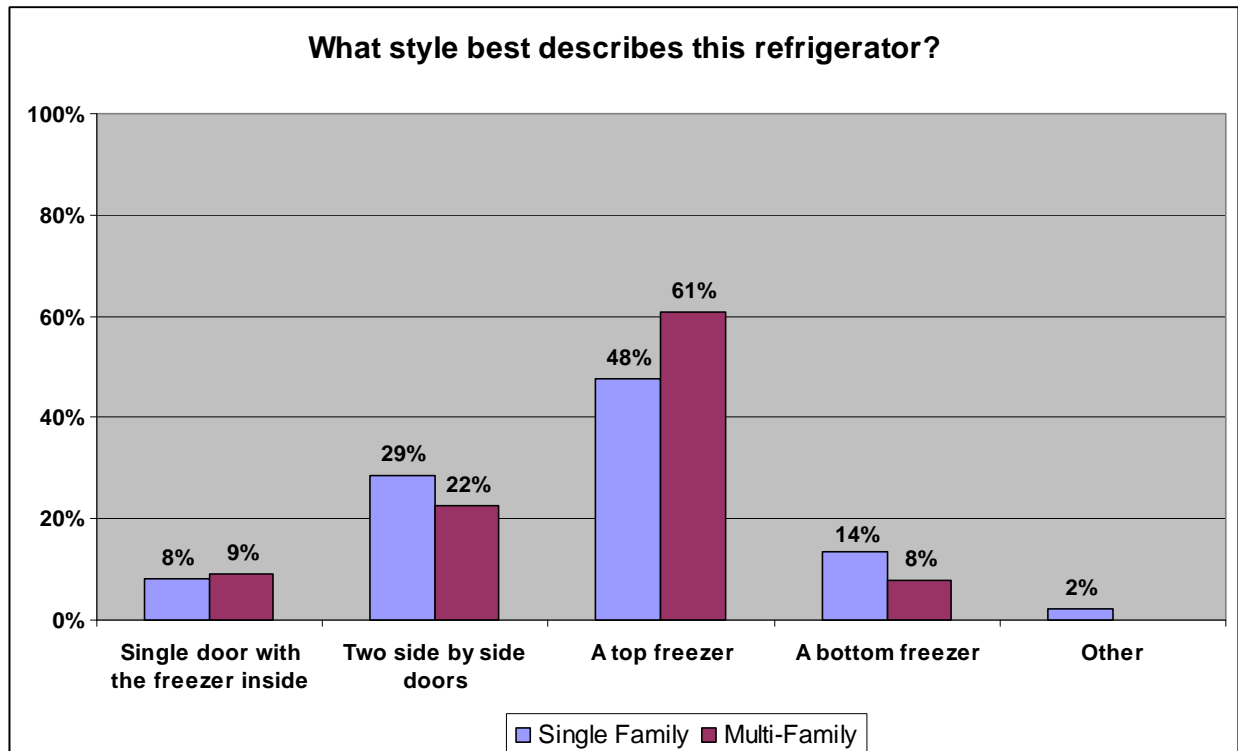


The predominant styles of refrigerators reported by respondents are those with a top freezer (51%) and those with two side by side doors (27%).

Table 3-99: Refrigerator Style

What style best describes this refrigerator?	Single Family		Multi-Family		Total	
	N	SF%	N	MF%	N	%
Single door with the freezer inside	23	8%	8	9%	31	8%
Two side by side doors	82	29%	20	22%	102	27%
A top freezer	137	48%	54	61%	191	51%
A bottom freezer	39	14%	7	8%	46	12%
Other	6	2%	0	0%	6	2%
Total	287	100%	89	100%	376	100%

Figure 3-99: Refrigerator Style

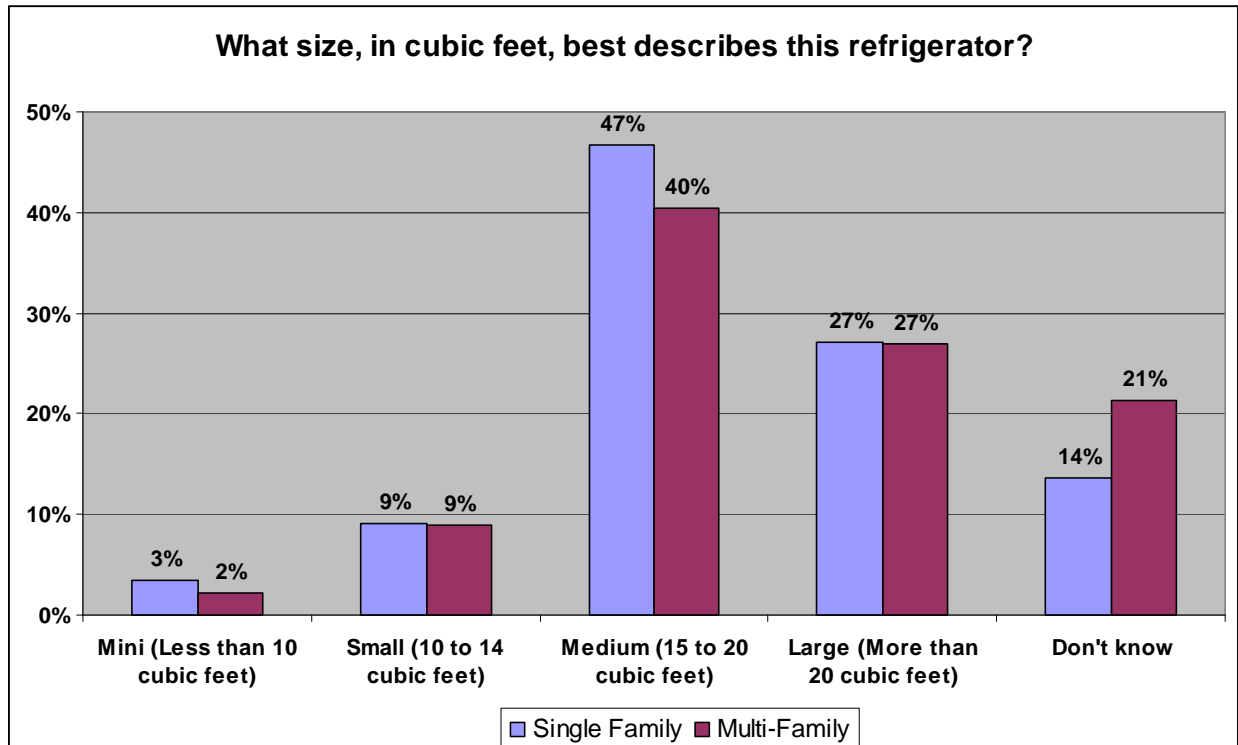


Respondents were asked to define the size of their refrigerators. Most residents have refrigerators ranging in size from 15 to 20 cubic feet (45%), followed by more than 20 cubic feet (27%).

Table 3-100: Refrigerator Size

What size, in cubic feet, best describes this refrigerator?	Single Family		Multi-Family		Total	
	N	SF%	N	MF%	N	%
Mini (Less than 10 cubic feet)	10	3%	2	2%	12	3%
Small (10 to 14 cubic feet)	26	9%	8	9%	34	9%
Medium (15 to 20 cubic feet)	134	47%	36	40%	170	45%
Large (More than 20 cubic feet)	78	27%	24	27%	102	27%
Don't know	39	14%	19	21%	58	15%
Total	287	100%	89	100%	376	100%

Figure 3-100: Refrigerator Size

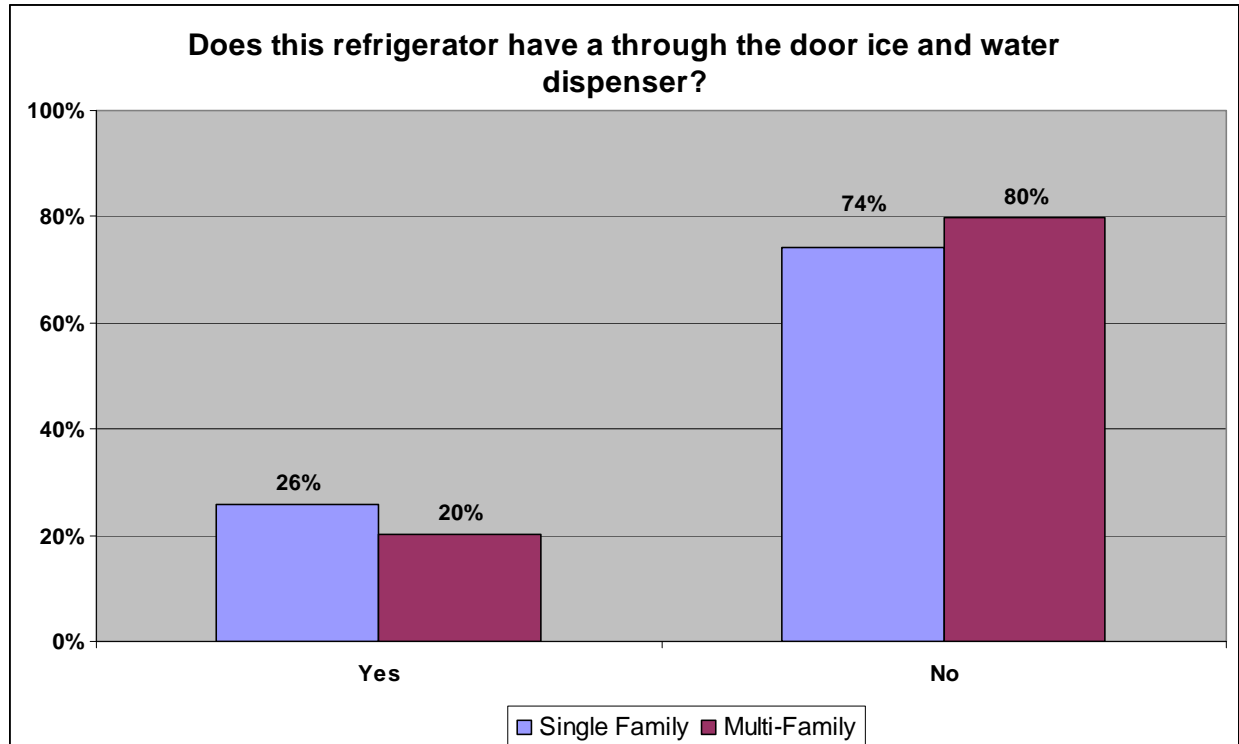


Most respondents (76%) report they do not have refrigerators with a through the door ice and water dispenser.

Table 3-101: Ice and Water Dispenser on Refrigerator

Does this refrigerator have a through the door ice and water dispenser?	Single Family		Multi-Family		Total	
	N	SF%	N	MF%	N	%
Yes	74	26%	18	20%	92	24%
No	213	74%	71	80%	284	76%
Total	287	100%	89	100%	376	100%

Figure 3-101: Ice and Water Dispenser on Refrigerator



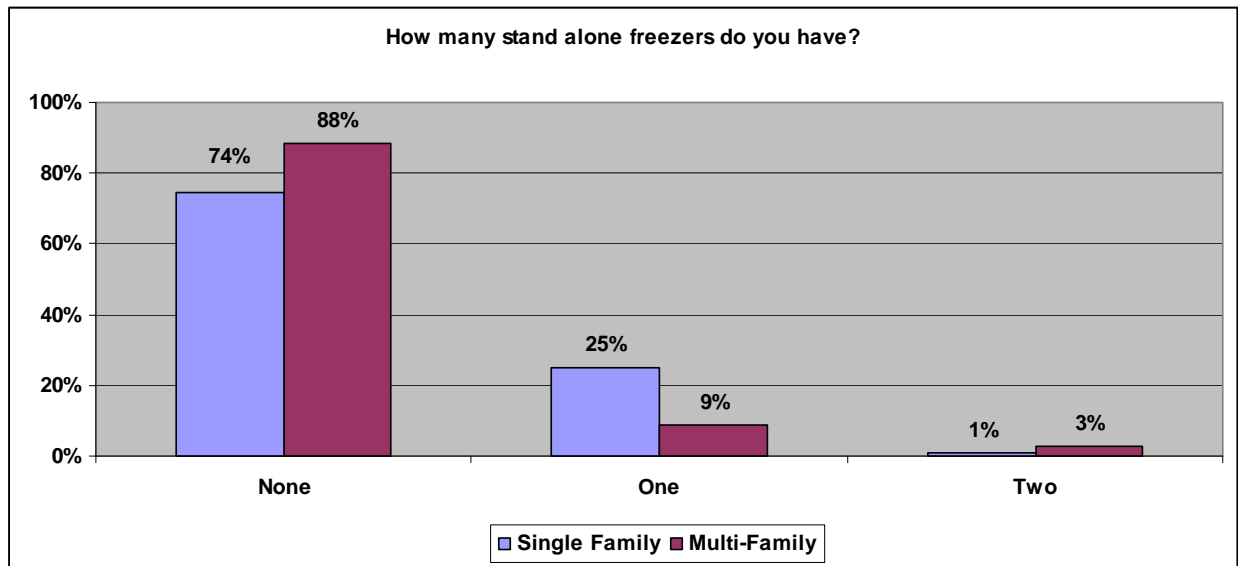
3.8.2 Stand-Alone Freezers

Respondents were asked to indicate how many stand alone freezers they use in their home. Less than a quarter of customers (22%) have a stand alone freezer.

Table 3-102: Quantity of Stand-Alone Freezers

How many stand alone freezers do you have?	Single Family		Multi-Family		Total	
	N	%	N	%	N	%
None	165	74%	69	88%	234	78%
One	55	25%	7	9%	62	21%
Two	2	1%	2	3%	4	1%
Total	222	100%	78	100%	300	100%

Figure 3-102: Quantity of Stand-Alone Freezers

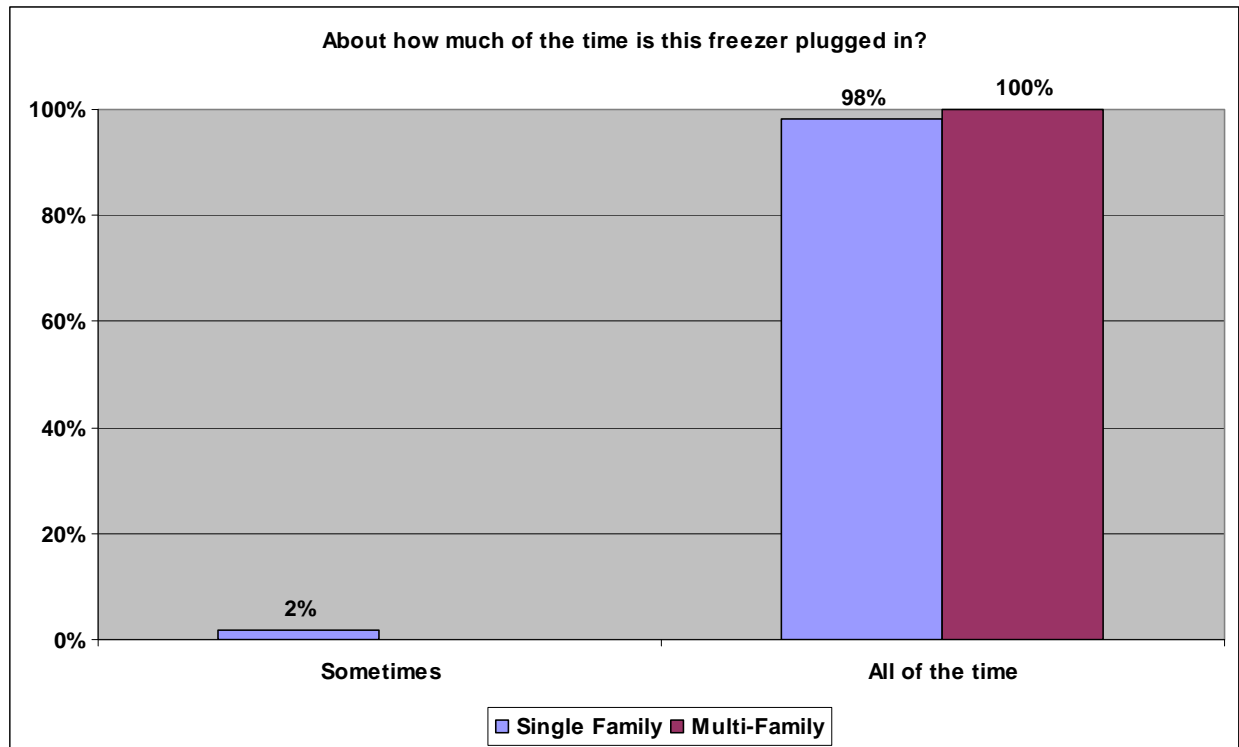


Survey results show that residents having stand-alone freezers are likely to them plugged in all of the time.

Table 3-103: Freezer Usage

About how much of the time is the freezer plugged in?	Single Family		Multi-Family		Total	
	N	SF%	N	MF%	N	%
Sometimes	1	2%	0	0%	1	1%
All of the time	58	98%	11	100%	69	99%
Total	59	100%	11	100%	70	100%

Figure 3-103: Freezer Usage

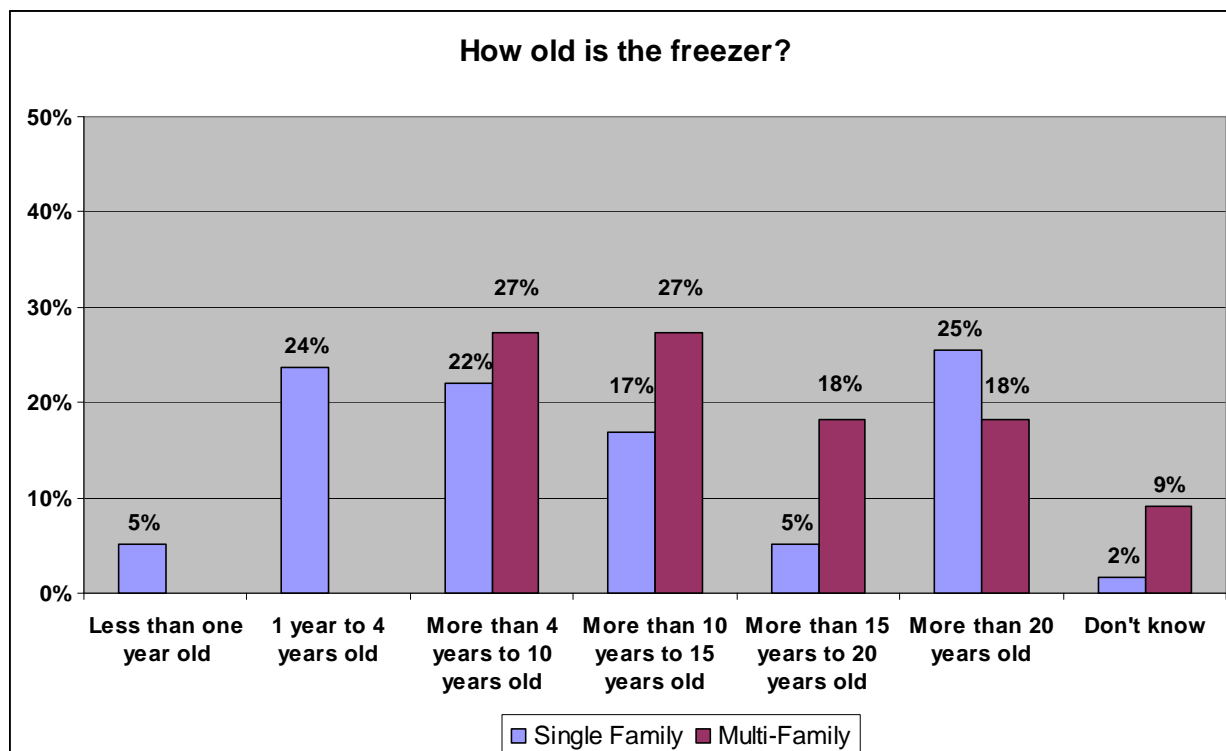


The survey found that half of stand alone freezers used by residents are over ten years old.

Table 3-104: Freezer Age

How old is the freezer?	Single Family		Multi-Family		Total	
	N	SF%	N	MF%	N	%
Less than one year old	3	5%	0	0%	3	4%
1 year to 4 years old	14	24%	0	0%	14	20%
More than 4 years to 10 years old	13	22%	3	27%	16	23%
More than 10 years to 15 years old	10	17%	3	27%	13	19%
More than 15 years to 20 years old	3	5%	2	18%	5	7%
More than 20 years old	15	25%	2	18%	17	24%
Don't know	1	2%	1	9%	2	3%
Total	59	100%	11	100%	70	100%

Figure 3-104: Freezer Age

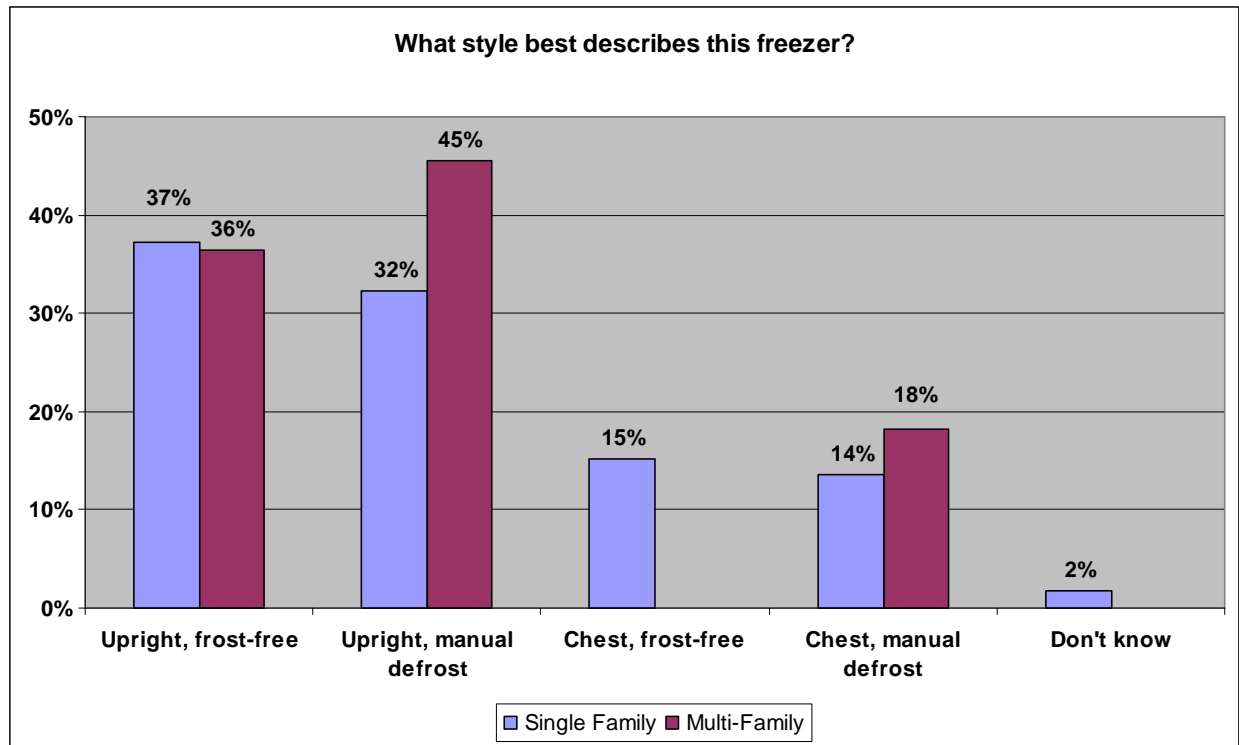


Nearly three-quarters of stand alone freezers (71%) are upright, with frost free or manual defrost features.

Table 3-105: Freezer Style

What style best describes this freezer?	Single Family		Multi-Family		Total	
	N	SF%	N	MF%	N	%
Upright, frost-free	22	37%	4	33%	26	37%
Upright, manual defrost	19	32%	5	56%	24	34%
Chest, frost-free	9	15%	0	0%	9	13%
Chest, manual defrost	8	14%	2	11%	10	14%
Don't know	1	2%	0	0%	1	1%
Total	59	100%	11	100%	70	100%

Figure 3-105: Freezer Style

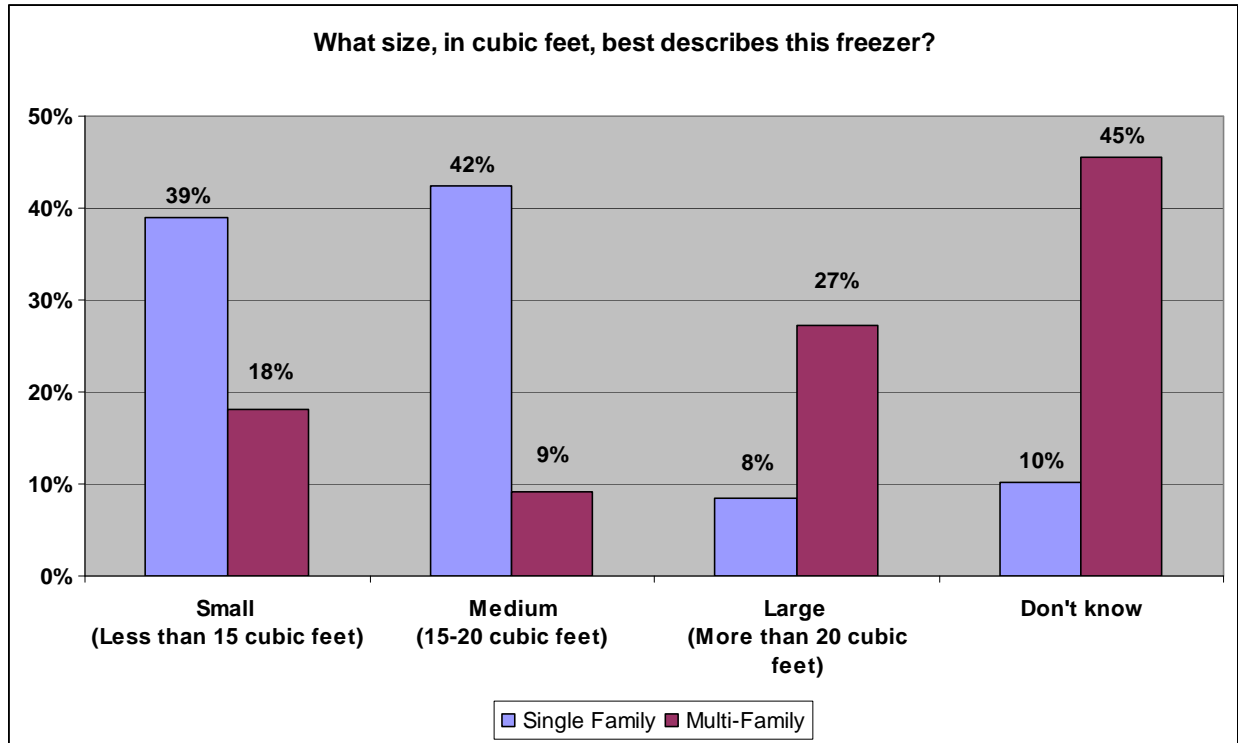


Respondents were asked to describe the size of their stand-alone freezers. Survey findings indicate most residents have stand alone freezers that are 15 to 20 cubic feet (37%) or less than 15 cubic feet (36%).

Table 3-106: Freezer Size

<i>What size, in cubic feet, best describes this freezer?</i>	<i>Single Family</i>		<i>Multi-Family</i>		<i>Total</i>	
	<i>N</i>	<i>SF%</i>	<i>N</i>	<i>MF%</i>	<i>N</i>	<i>%</i>
Small (Less than 15 cubic feet)	23	39%	2	18%	25	36%
Medium (15-20 cubic feet)	25	42%	1	9%	26	37%
Large (More than 20 cubic feet)	5	8%	3	27%	8	11%
Don't know	6	10%	5	45%	11	16%
Total	59	100%	11	100%	66	100%

Figure 3-106: Freezer Size



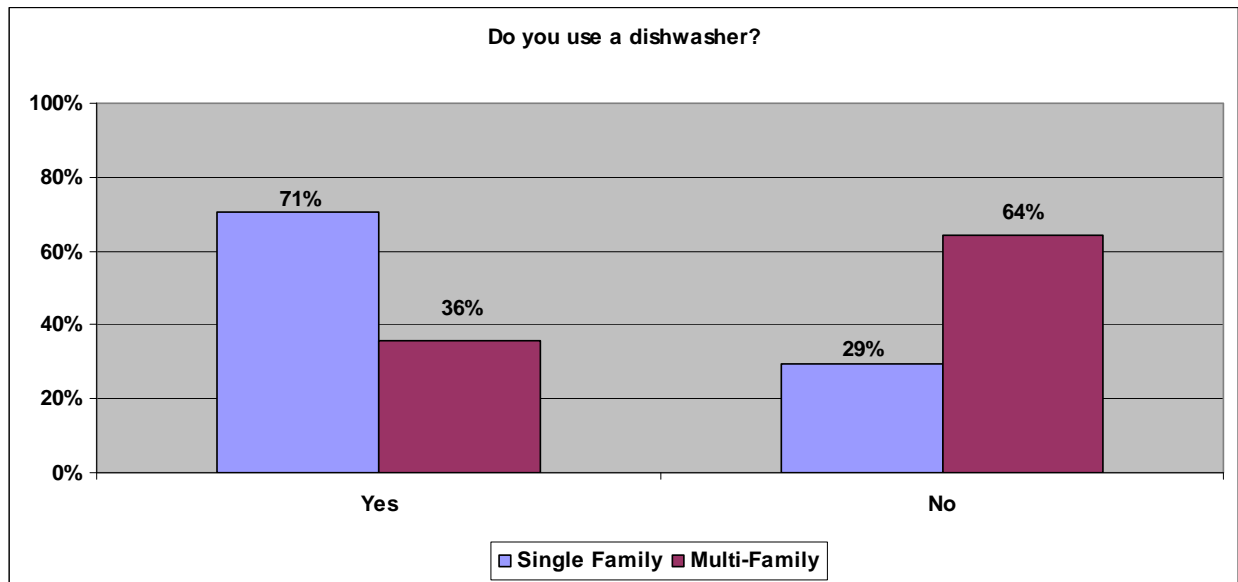
3.8.3 Dishwashers

Most single family residences report using a dishwasher (71%), while most multi-family residences report no dishwasher use (64%).

Table 3-107: Dishwasher Use

<i>Do you use a dishwasher in your home?</i>	Single Family		Multi-Family		Total	
	N	%	N	%	N	%
Yes	157	71%	28	36%	185	62%
No	65	29%	50	64%	115	38%
Total	222	100%	78	100%	300	100%

Figure 3-107: Dishwasher Use

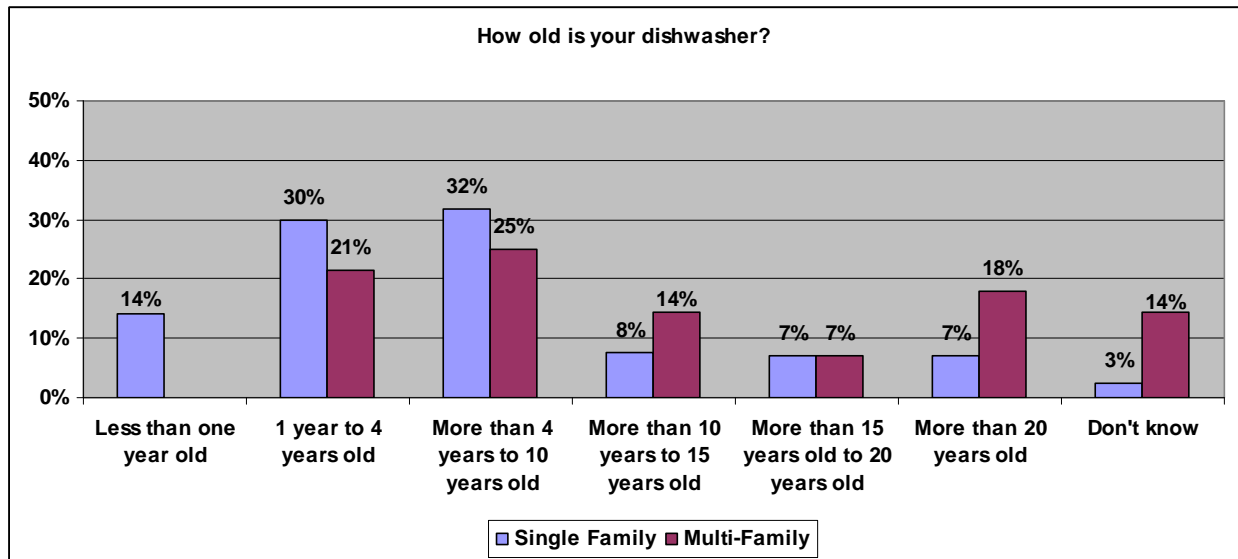


Sixty percent of residents who indicated using a dishwasher report their appliance ranges in age from 1 to 10 years. A quarter of residents using a dishwasher report their appliance is over 10 years old.

Table 3-108: Dishwasher Age

<i>How old is your dishwasher?</i>	<i>Single Family</i>		<i>Multi-Family</i>		<i>Total</i>	
	N	%	N	%	N	%
Less than one year old	22	14%	0	0%	22	12%
1 year to 4 years old	47	30%	6	21%	53	29%
More than 4 years to 10 years old	50	32%	7	25%	57	31%
More than 10 years to 15 years old	12	8%	4	14%	16	9%
More than 15 years old to 20 years old	11	7%	2	7%	13	7%
More than 20 years old	11	7%	5	18%	16	9%
Don't know	4	3%	4	14%	8	4%
Total	157	100%	28	100%	185	100%

Figure 3-108: Dishwasher Age

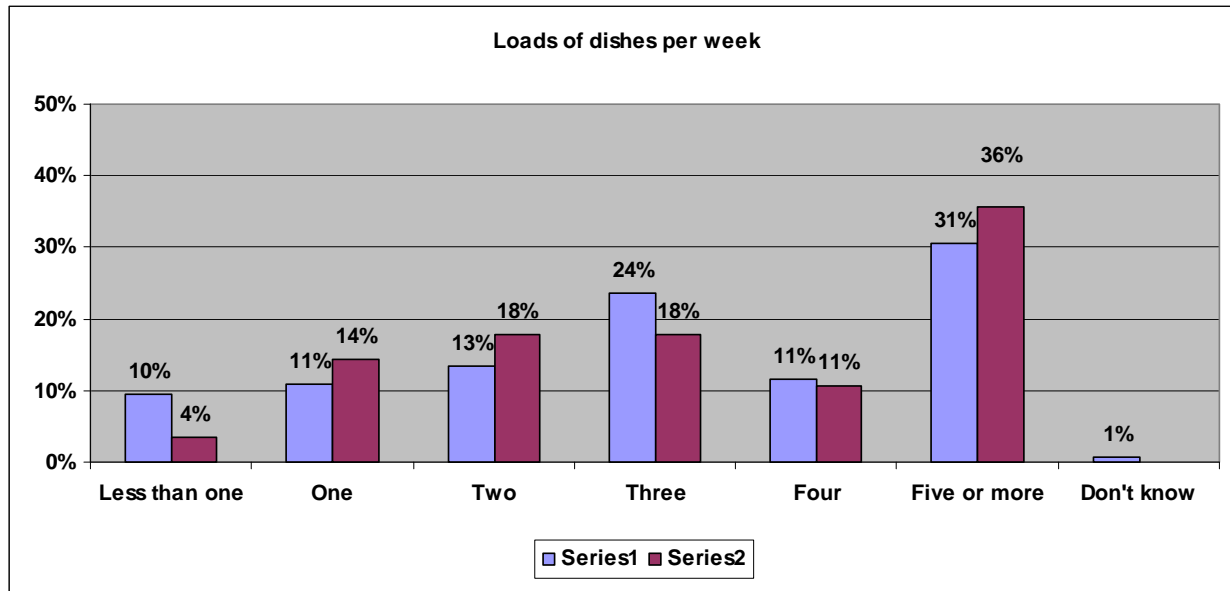


Almost a third of respondents (31%) using a dishwasher report washing five or more loads per week.

Table 3-109: Number of Dishwasher Loads per Week

How many loads of dishes do you typically wash per week?	Single Family		Multi-Family		Total	
	N	%	N	%	N	%
Less than one	15	10%	1	4%	16	9%
One	17	11%	4	14%	21	11%
Two	21	13%	5	18%	26	14%
Three	37	24%	5	18%	42	23%
Four	18	11%	3	11%	21	11%
Five or more	48	31%	10	36%	58	31%
Don't know	1	1%	0	0%	1	1%
Total	157	100%	28	100%	185	100%

Figure 3-109: Number of Dishwasher Loads per Week



3.8.4 Cooking Equipment

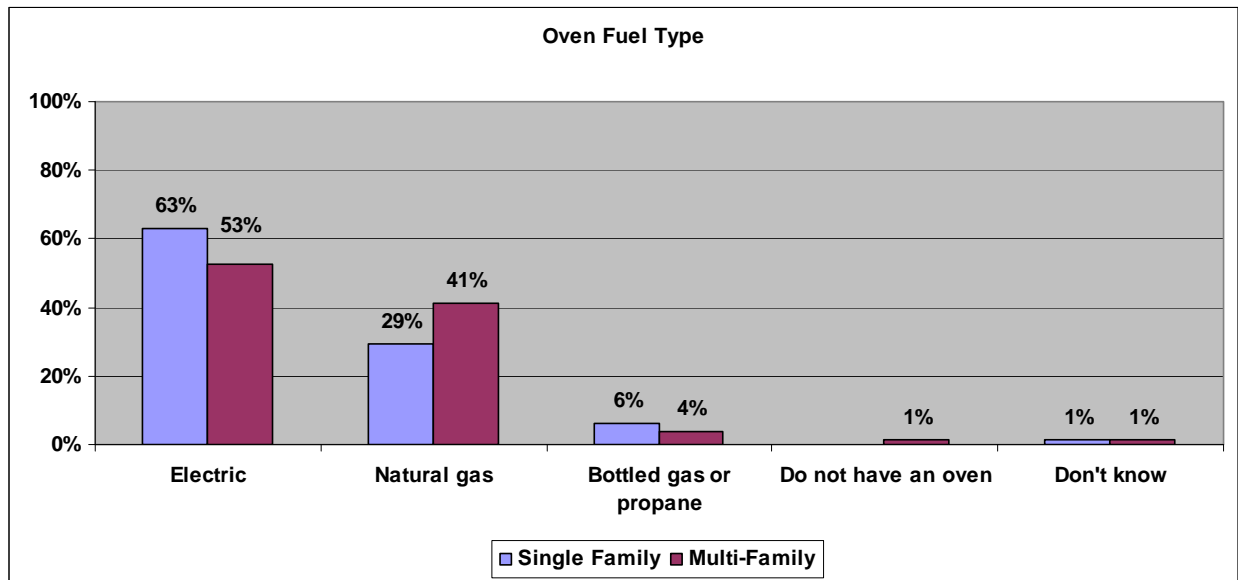
Respondents were asked about their cooking equipment. The following tables display data collected on microwaves, ovens and cook-top/burners.

The majority of respondents (60%) report they use electricity for their oven. Slightly less than a third of respondents (32%) indicate they use natural gas as their fuel for their oven use. While single family homes report a higher rate of electricity use to natural gas (approximately 2 to 1), multi-family home report a more even rate of electricity use compared to natural gas.

Table 3-110: Oven Fuel

What type of fuel does your oven use?	Single Family		Multi-Family		Total	
	N	%	N	%	N	%
Electric	140	63%	41	53%	181	60%
Natural gas	65	29%	32	41%	97	32%
Bottled gas or propane	14	6%	3	4%	17	6%
Do not have an oven	0	0%	1	1%	1	0%
Don't know	3	1%	1	1%	4	1%
Total	222	100%	78	100%	300	100%

Figure 3-110: Oven Fuel

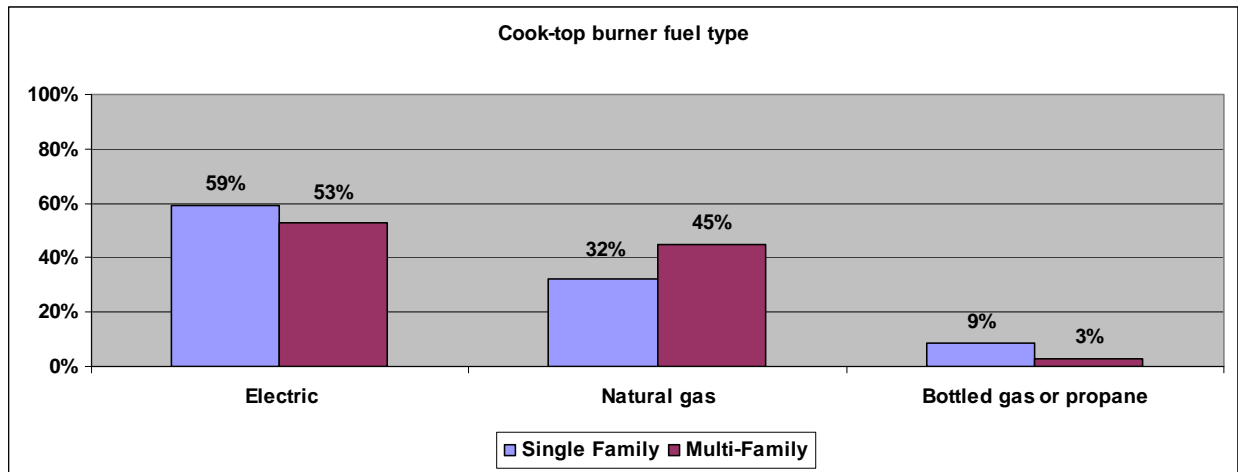


Similar to oven fuel use, the majority of respondents report using electricity to fuel their cook-top/burner. Furthermore, the pattern of greater differential in use of electricity compared to gas in single family homes (approximately 2 to 1) compared to multi-family homes is similar for cook-top/burners.

Table 3-111: Cook-Top/Burner Fuel

What type of fuel does your cook-top or burners use?	Single Family		Multi-Family		Total	
	N	%	N	%	N	%
Electric	130	59%	40	53%	170	58%
Natural gas	70	32%	34	45%	104	35%
Bottled gas or propane	19	9%	2	3%	21	7%
Total	219	100%	76	100%	295	100%

Figure 3-111: Cook-Top/Burner Fuel

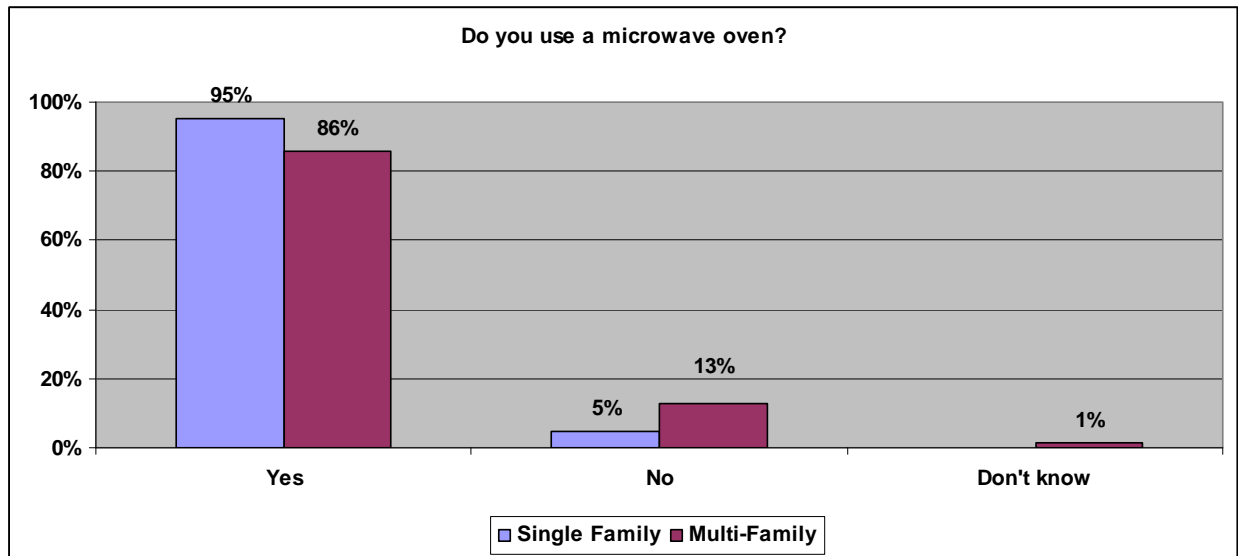


Nearly all respondents (93%) report they use a microwave oven.

Table 3-112: Microwave Oven Use

<i>Do you use a microwave oven?</i>	Single Family		Multi-Family		Total	
	N	%	N	%	N	%
Yes	211	95%	67	86%	278	93%
No	11	5%	10	13%	21	7%
Don't know	0	0%	1	1%	1	0%
Total	222	100%	78	100%	300	100%

Figure 3-112: Microwave Oven Use



3.9 Laundry Appliances

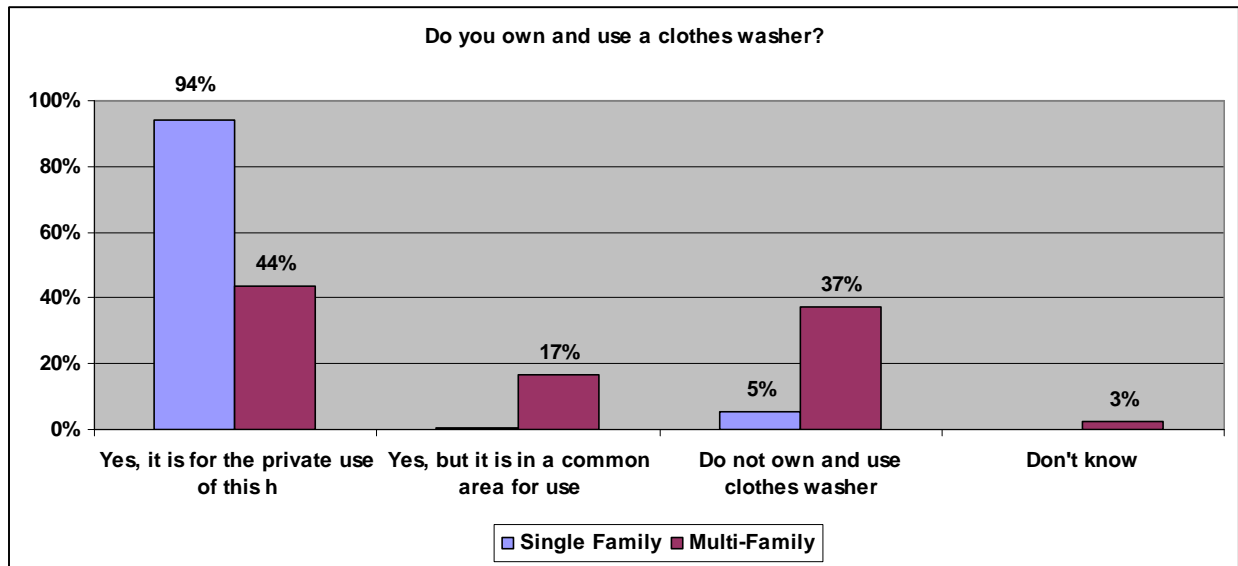
In a section-opening question, customers were asked to indicate whether or not they own and use a clothes washer. The majority of respondents (81%) report having a clothes washer for private use in their home.

Broken down by residence type, there is significantly greater clothes washer ownership in single family homes (where 94% indicate ownership) compared to multi-family residences (where 44% report ownership).

Table 3-113: Clothes Washer Ownership

<i>Do you own and use a clothes washer?</i>	Single Family		Multi-Family		Total	Total
	N	%	N	%	N	%
Yes, it is for the private use of this home	209	94%	34	44%	243	81%
Yes, but it is in a common area for use	1	0%	13	17%	14	5%
Do not own and use clothes washer	12	5%	29	37%	41	14%
Don't know	0	0%	2	3%	2	1%
Total	222	100%	78	100%	300	100%

Figure 3-113: Clothes Washer Ownership

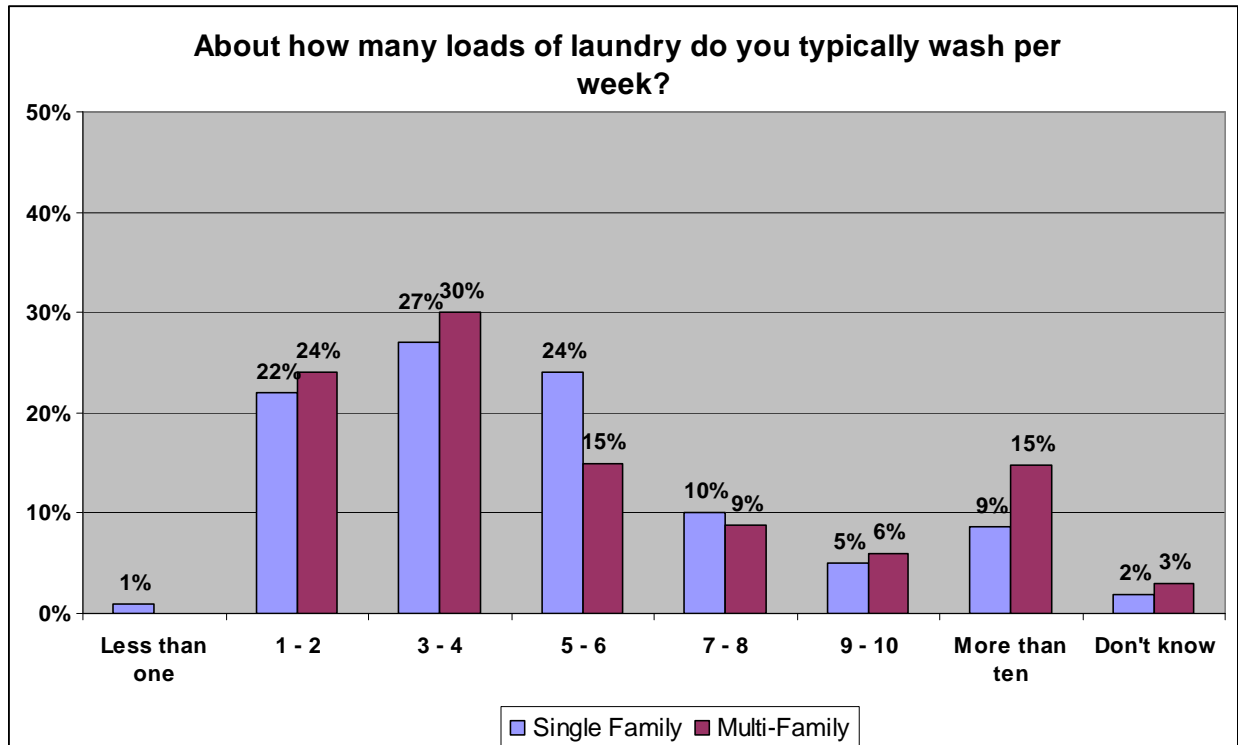


Survey results indicate the number of loads of laundry typically washed per week appears to have a wide distribution among residential customers, with 60% washing 2 to 5 loads per week. Almost one in ten residents (9%) report washing 10 or more loads per week.

Table 3-114: Loads of Laundry per Week

About how many loads of laundry do you typically wash per week?	Single Family		Multi-Family		Total	
	N	SF%	N	MF%	N	%
Less than one	2	1%	0	0%	2	1%
One	10	5%	1	3%	11	5%
Two	36	17%	7	21%	43	18%
Three	34	16%	6	18%	40	16%
Four	23	11%	4	12%	27	11%
Five	33	16%	4	12%	37	15%
Six	17	8%	1	3%	18	7%
Seven	15	7%	3	9%	18	7%
Eight	7	3%	0	0%	7	3%
Nine	2	1%	0	0%	2	1%
Ten	8	4%	2	6%	10	4%
More than ten	18	9%	5	15%	23	9%
Don't know	4	2%	1	3%	5	2%
Total	209	100%	34	100%	243	100%

Figure 3-114: Loads of Laundry per Week

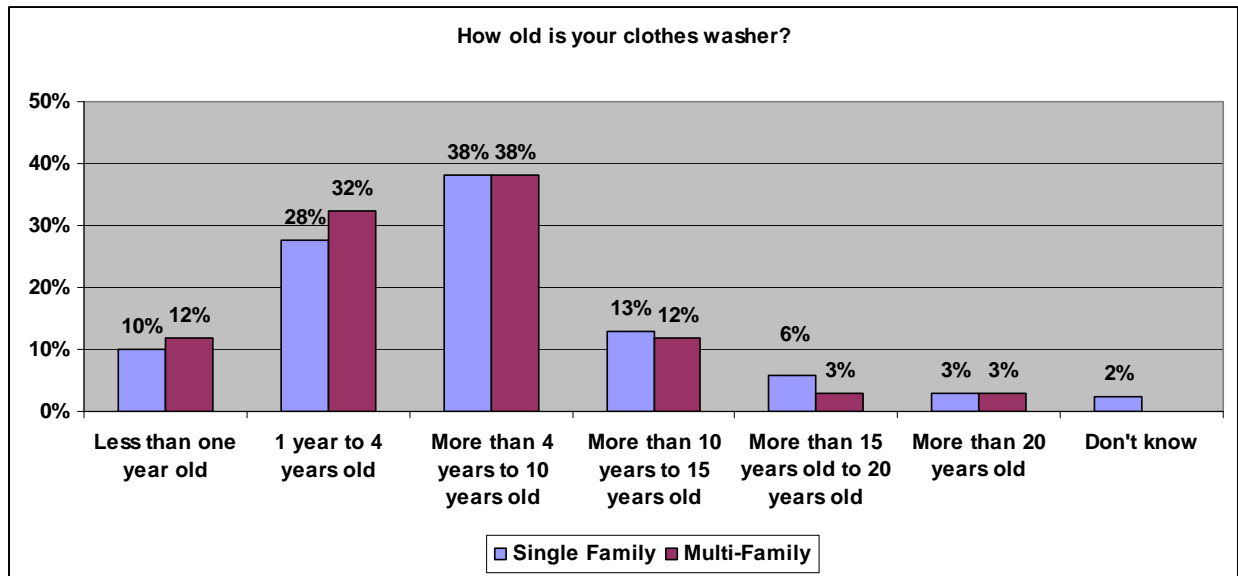


Respondents were asked to report the age of their clothes washer. Over one in five residents (21%) having a clothes washer report their system is over 10 years old. Single and multi-family respondents indicate a similar pattern in regards to clothes washer age.

Table 3-115: Clothes Washer Age

<i>How old is your clothes washer?</i>	Single Family		Multi-Family		Total	Total
	N	%	N	%	N	%
Less than one year old	21	10%	4	12%	25	10%
1 year to 4 years old	58	28%	11	32%	69	28%
More than 4 years to 10 years old	80	38%	13	38%	93	38%
More than 10 years to 15 years old	27	13%	4	12%	31	13%
More than 15 years old to 20 years old	12	6%	1	3%	13	5%
More than 20 years old	6	3%	1	3%	7	3%
Don't know	5	2%	0	0%	5	2%
Total	209	100%	34	100%	243	100%

Figure 3-115: Clothes Washer Age

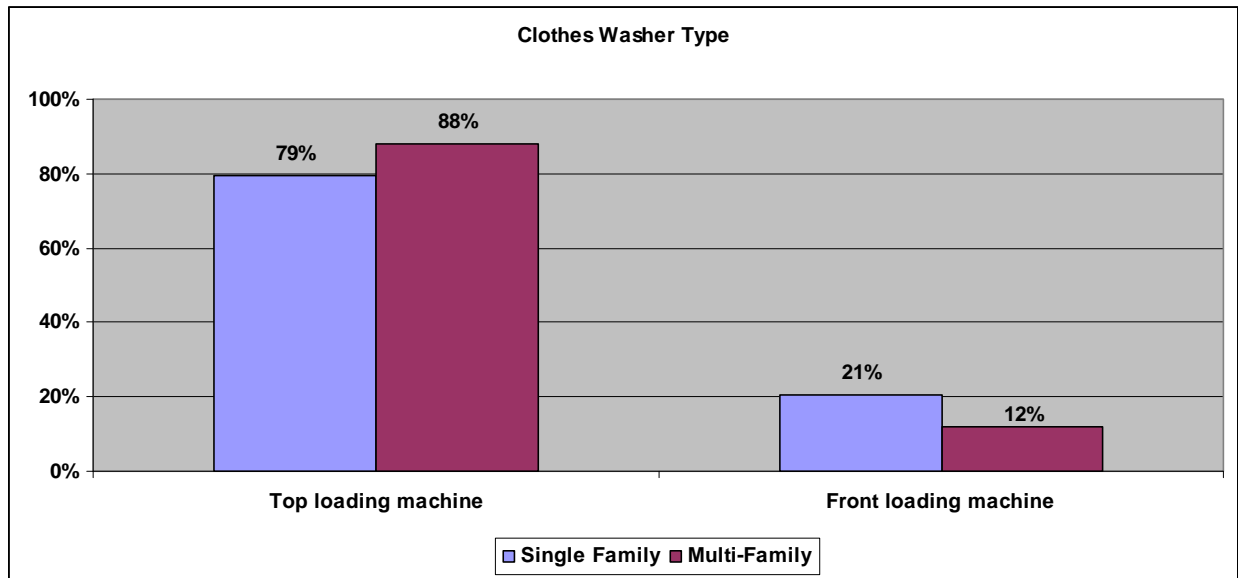


Those respondents who indicated they owned a clothes washer were asked to provide the type of washing machine they used. Most respondents (81%) report using a “top loading” machine.

Table 3-116: Clothes Washer Type: Top Loading or Front-Loading?

Is your clothes washer a top loading machine or a front loading machine?	Single Family		Multi-Family		Total	Total
	N	%	N	%	N	%
Top loading machine	166	79%	30	88%	196	81%
Front loading machine	43	21%	4	12%	47	19%
Total	209	100%	34	100%	243	100%

Figure 3-116: Clothes Washer Type: Top Loading or Front-Loading?

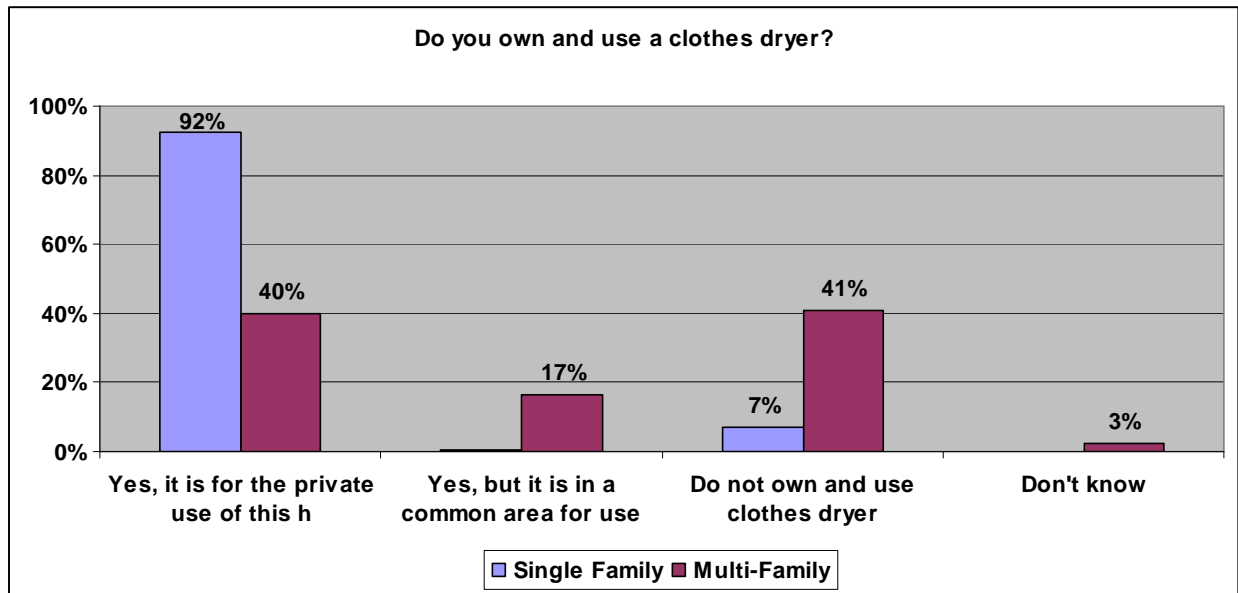


Additionally, customers owning clothes washers were asked if they owned clothes dryers. Results present a distinctive difference between single family use and multi-family use. Nearly all single family respondents (92%) report they have a privately owned clothes dryer. In contrast, less than half of multi-family respondents (40%) report owning a private-use clothes dryer.

Table 3-117: Clothes Dryer Ownership

<i>Do you own and use a clothes dryer?</i>	Single Family		Multi-Family		Total	Total
	N	%	N	%	N	%
Yes, it is for the private use of this home	205	92%	31	40%	236	79%
Do not own and use clothes dryer	16	7%	32	41%	48	16%
Yes, but it is in a common area for use	1	0%	13	17%	14	5%
Don't know	0	0%	2	3%	2	1%
Total	222	100%	78	100%	300	100%

Figure 3-117: Clothes Dryer Ownership

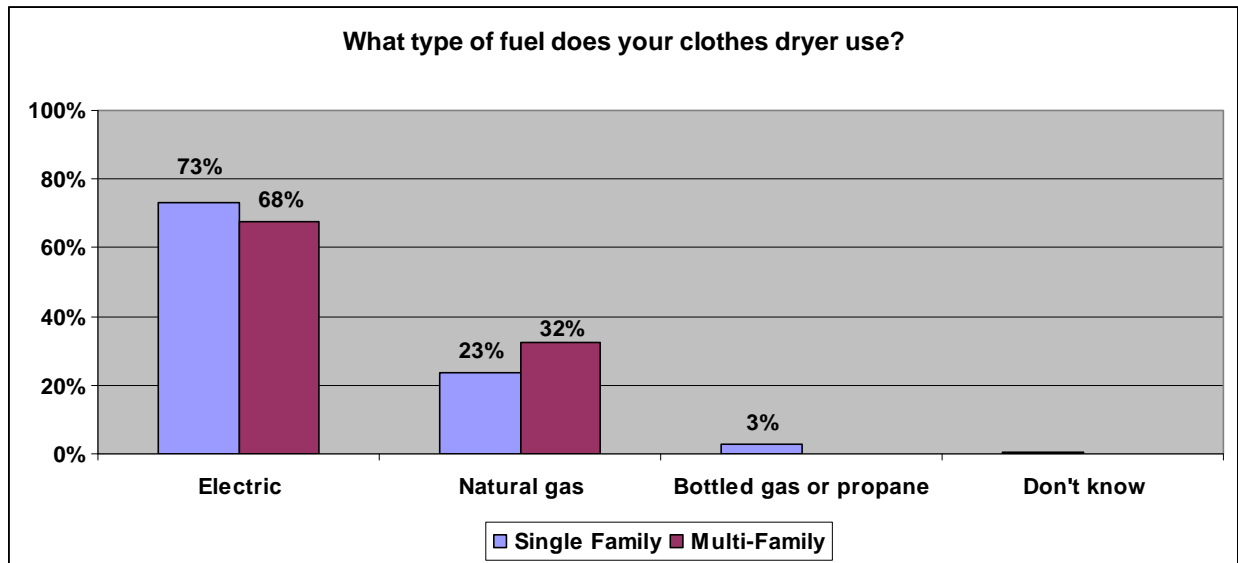


Respondents owning a private-use clothes dryer were asked to indicate the method used to dry their clothes. Nearly three quarters of respondents (72%) indicate using electricity as their fuel source for clothes drying.

Table 3-118: Clothes Dryer Fuel Type

<i>What type of fuel does your clothes dryer use?</i>	Single Family		Multi-Family		Total	Total
	N	%	N	%	N	%
Electric	150	73%	21	68%	171	72%
Natural gas	48	23%	10	32%	58	25%
Bottled gas or propane	6	3%	0	0%	6	3%
Don't know	1	0%	0	0%	1	0%
Total	205	100%	31	100%	236	100%

Figure 3-118: Clothes Dryer Fuel Type

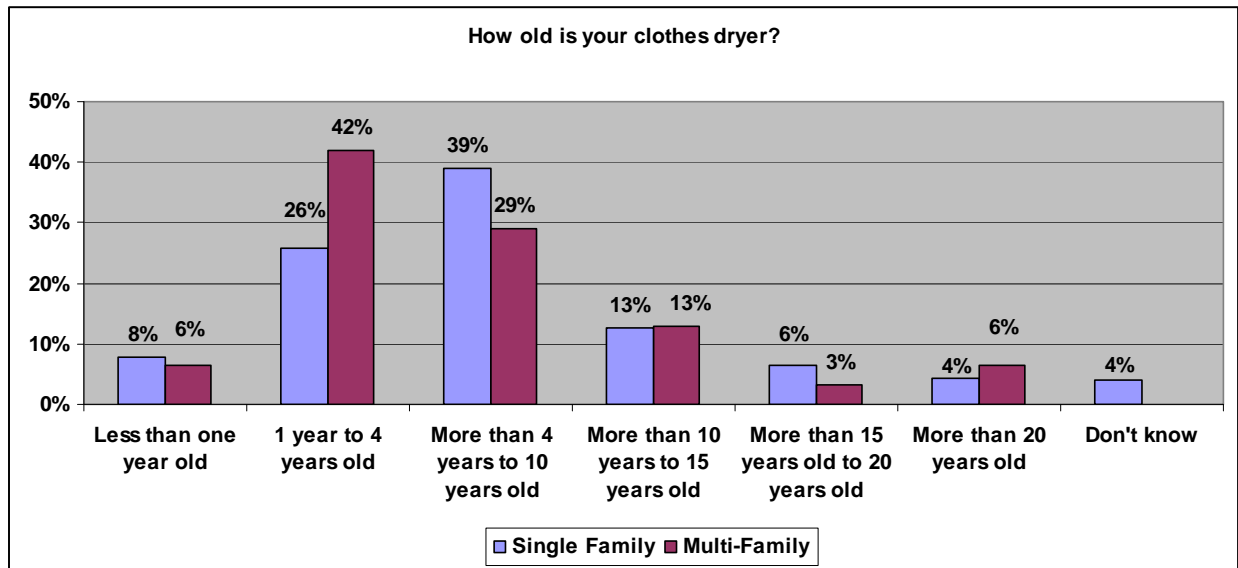


Respondents were also asked to report the age of their clothes dryer. Similar to clothes washers, more than one in five residents (24%) report having dryers older than 10 years old.

Table 3-119: Clothes Dryer Age

<i>How old is your clothes dryer?</i>	Single Family		Multi-Family		Total	Total
	N	%	N	%	N	%
Less than one year old	16	8%	2	6%	18	8%
1 year to 4 years old	53	26%	13	42%	66	28%
More than 4 years to 10 years old	80	39%	9	29%	89	38%
More than 10 years to 15 years old	26	13%	4	13%	30	13%
More than 15 years old to 20 years old	13	6%	1	3%	14	6%
More than 20 years old	9	4%	2	6%	11	5%
Don't know	8	4%	0	0%	8	3%
Total	205	100%	31	100%	236	100%

Figure 3-119: Clothes Dryer Age

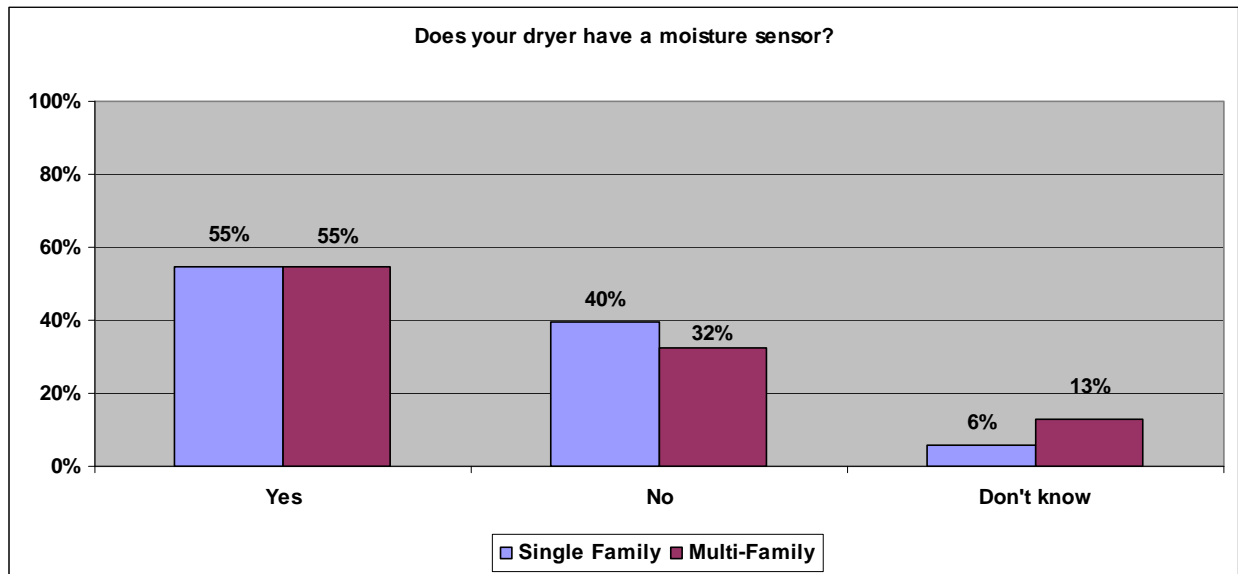


The majority of respondents (55%) report their dryer has a moisture sensor. However, over a third (39%) report having a dryer with no moisture sensor, indicating a need to further promote this technology.

Table 3-120: Moisture Sensor

<i>Does your dryer have a moisture sensor?</i>	<i>Single Family</i>		<i>Multi-Family</i>		<i>Total</i>	
	N	%	N	%	N	%
Yes	112	55%	17	55%	129	55%
No	81	40%	10	32%	91	39%
Don't know	12	6%	4	13%	16	7%
Total	205	100%	31	100%	236	100%

Figure 3-120: Moisture Sensor

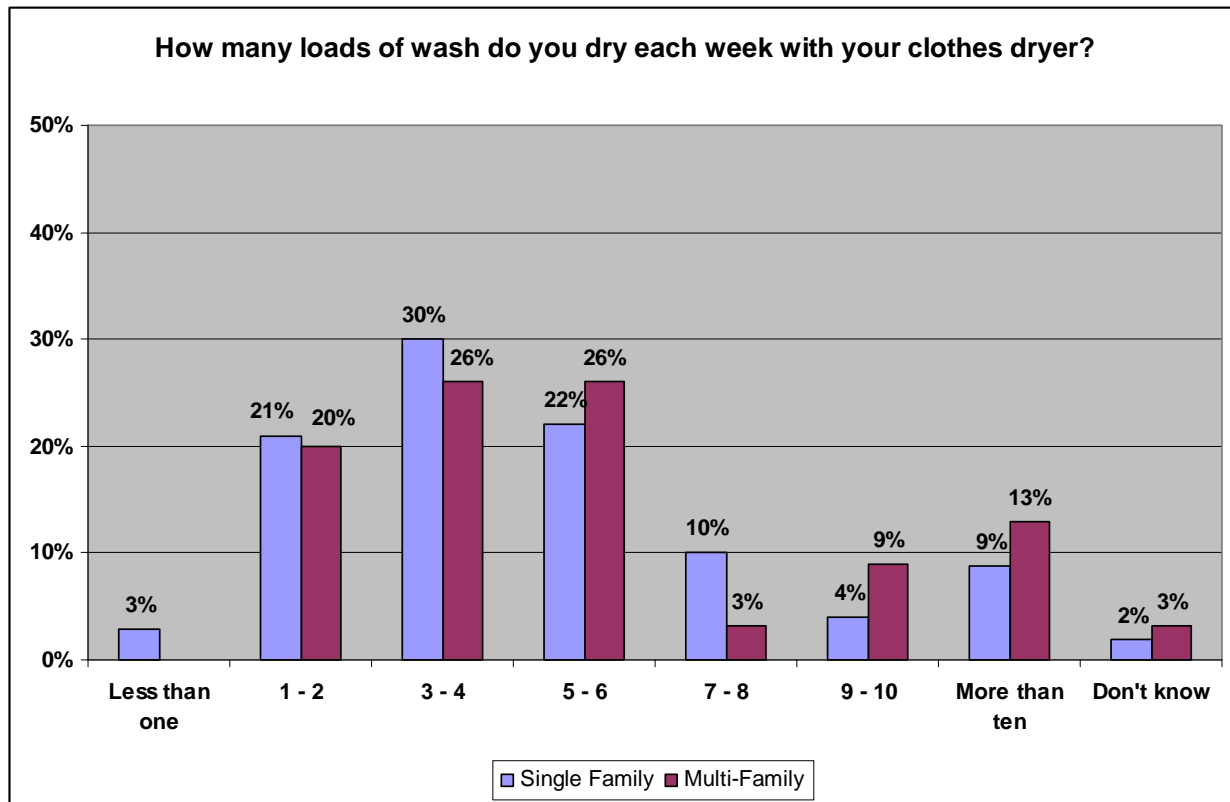


The amount of clothes dryer loads per week indicated by respondents is widely distributed with a concentration between one to six loads. There appears to be little difference in the number of loads dried between single and multi-family homes. Similar to findings found for frequency of clothes washing, almost one in ten residents (9%) report drying 10 or more loads per week.

Table 3-121: Amount of clothes dryer loads

<i>How many loads of wash do you dry each week with your clothes dryer?</i>	<i>Single Family</i>		<i>Multi-Family</i>		<i>Total</i>	
	<i>N</i>	<i>SF%</i>	<i>N</i>	<i>MF%</i>	<i>N</i>	<i>%</i>
Less than one	6	3%	0	0%	6	3%
1 – 2	43	21%	6	20%	49	21%
3 – 4	60	30%	8	26%	68	29%
5 – 6	45	22%	8	26%	53	22%
7 – 8	20	10%	1	3%	21	9%
9 – 10	9	4%	3	9%	12	5%
More than ten	18	9%	4	13%	22	9%
Don't know	4	2%	1	3%	5	2%
Total	205	101%	31	100%	236	100%

Figure 3-121: Amount of clothes dryer loads



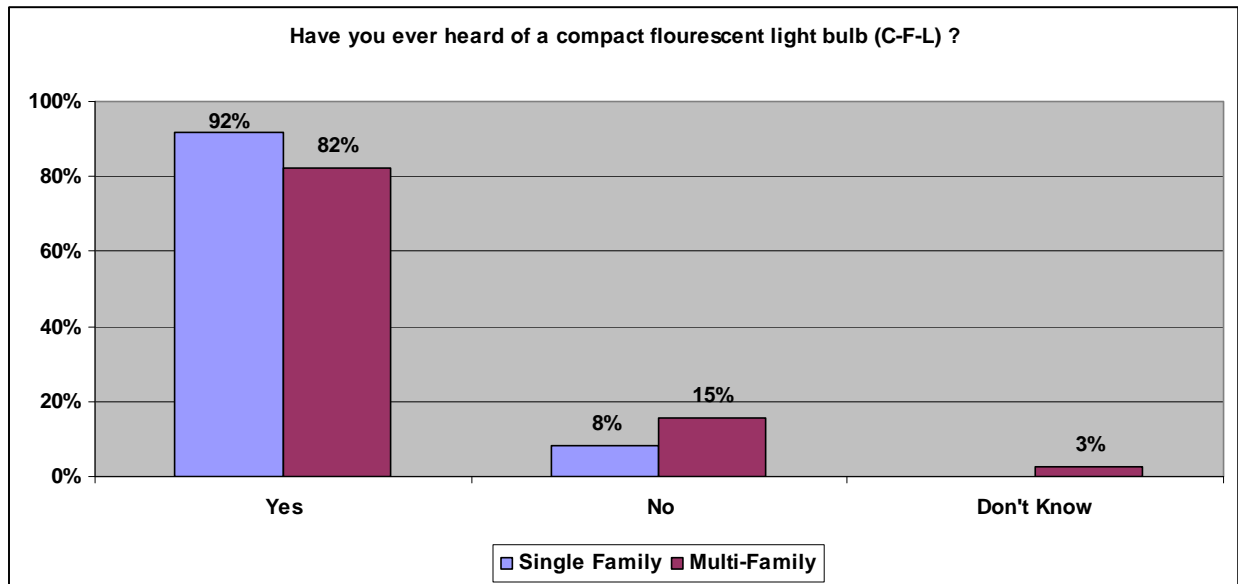
3.10 Lighting

All respondents were asked if they had ever heard of a compact fluorescent light bulb. The vast majority of respondents (89%) indicate CFL awareness.

Table 3-122: Compact Fluorescent Bulb Awareness

Have you ever heard of a compact fluorescent light bulb, sometimes referred to as a C-F-L bulb?	Single Family		Multi-Family		Total	Total
	N	%	N	%	N	%
Yes	204	92%	64	82%	268	89%
No	18	8%	12	15%	30	10%
Don't Know	0	0%	2	3%	2	1%
Total	222	100%	78	100%	300	100%

Figure 3-122: Compact Fluorescent Bulb Awareness

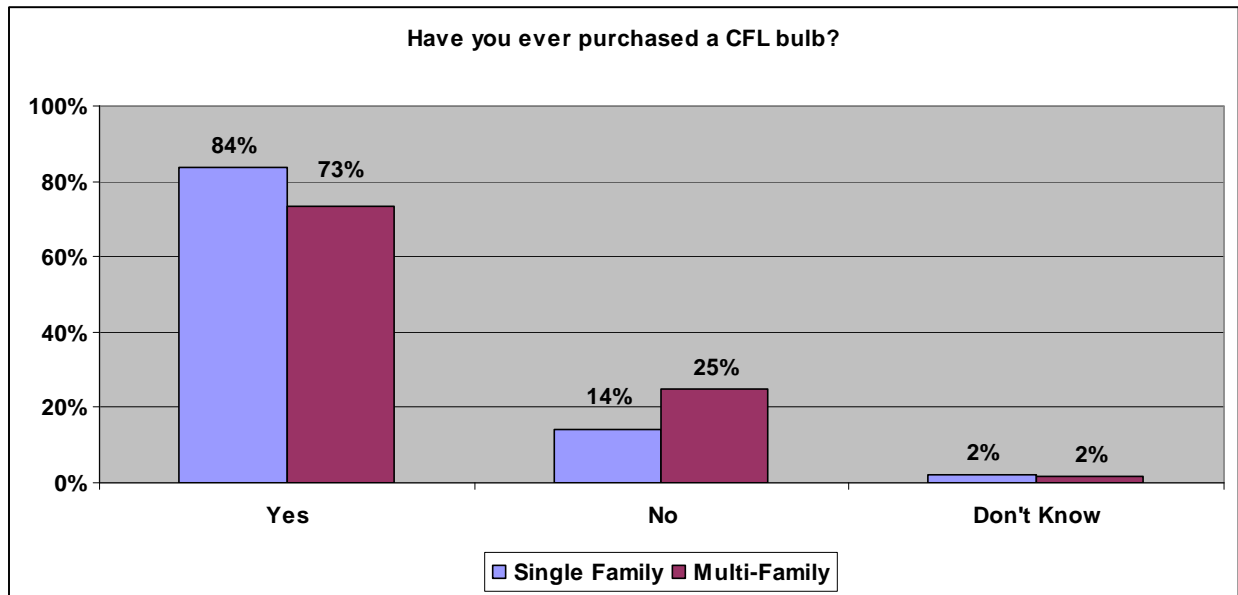


Respondents who were aware of compact fluorescent light bulbs were asked if they had ever purchased a CFL. The majority of respondents (81%) report they have purchased a CFL.

Table 3-123: CFL Purchases

<i>Have you ever purchased a compact fluorescent light bulb?</i>	Single Family		Multi-Family		Total	Total
	N	%	N	%	N	%
Yes	171	84%	47	73%	218	81%
No	29	14%	16	25%	45	17%
Don't Know	4	2%	1	2%	5	2%
Total	204	100%	64	100%	268	100%

Figure 3-123: CFL Purchases

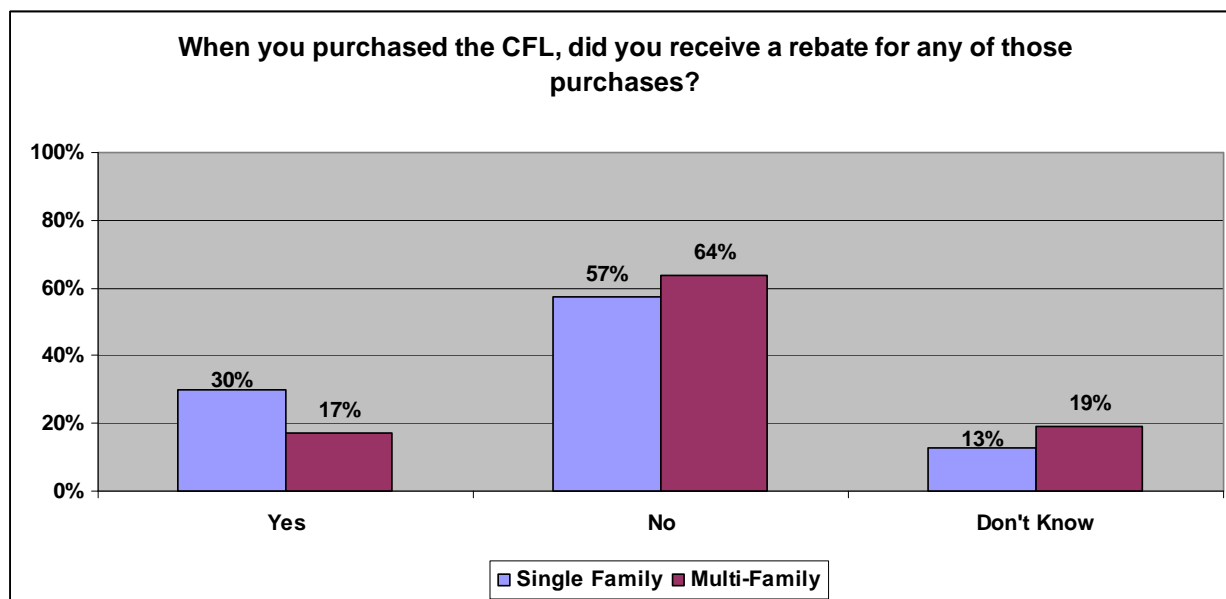


Respondents who were aware of compact fluorescent light bulbs were also asked if they received a rebate for any CFL purchases. The majority of respondents (59%) indicate they did not receive rebates for CFL purchases.

Table 3-124: CFL Rebates

<i>When you purchased the compact fluorescent light bulb(s), did you receive a rebate for any of those purchases?</i>	Single Family		Multi-Family		Total	Total
	N	%	N	%	N	%
Yes	51	30%	8	17%	59	27%
No	98	57%	30	64%	128	59%
Don't Know	22	13%	9	19%	31	14%
Total	171	100%	47	100%	218	100%

Figure 3-124: CFL Rebates

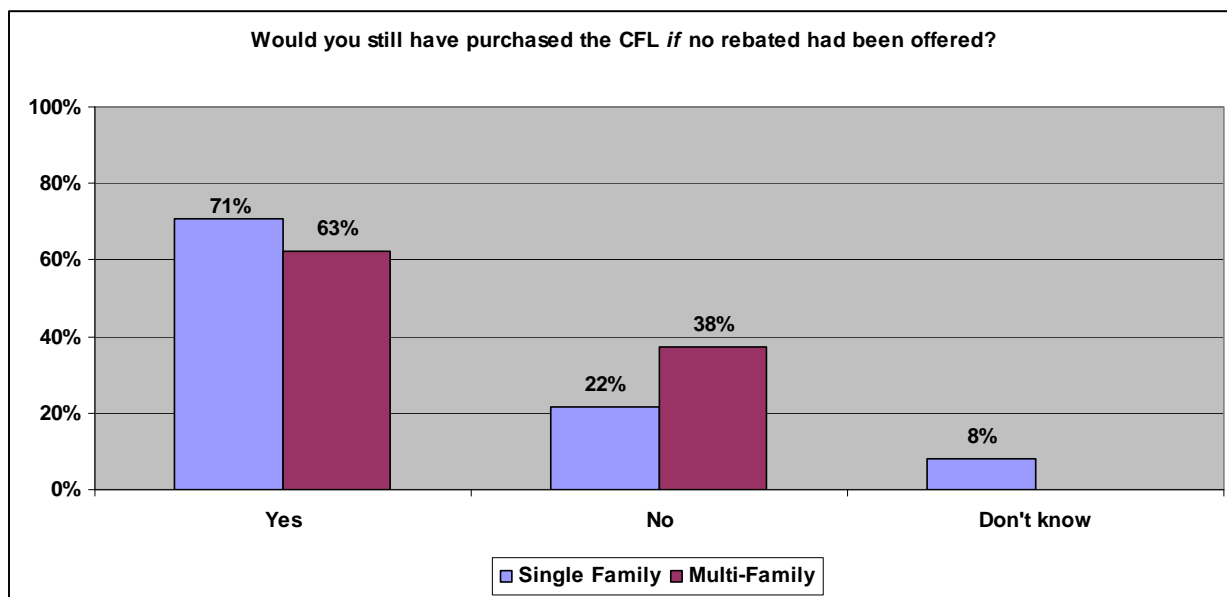


Nearly three quarters of respondents (69%) who received a rebate report they would have purchased the CFL bulb without the offer.

Table 3-125: CFL with No Rebate

Would you still have purchased the compact fluorescent light bulbs if no rebate had been offered?	Single Family		Multi-Family		Total	Total
	N	%	N	%	N	%
Yes	36	71%	5	63%	41	69%
No	11	22%	3	38%	14	24%
Don't Know	4	8%	0	0%	4	7%
Total	51	100%	8	100%	59	100%

Figure 3-125: CFL with No Rebate



In Table 3-126, respondents report the number of identified lighting products they have in their home. Note that most residents don't have LED lights, halogen floor lamps, fluorescent floor lamps and indoor and outdoor lighting controls.

Table 3-126: Lighting Products

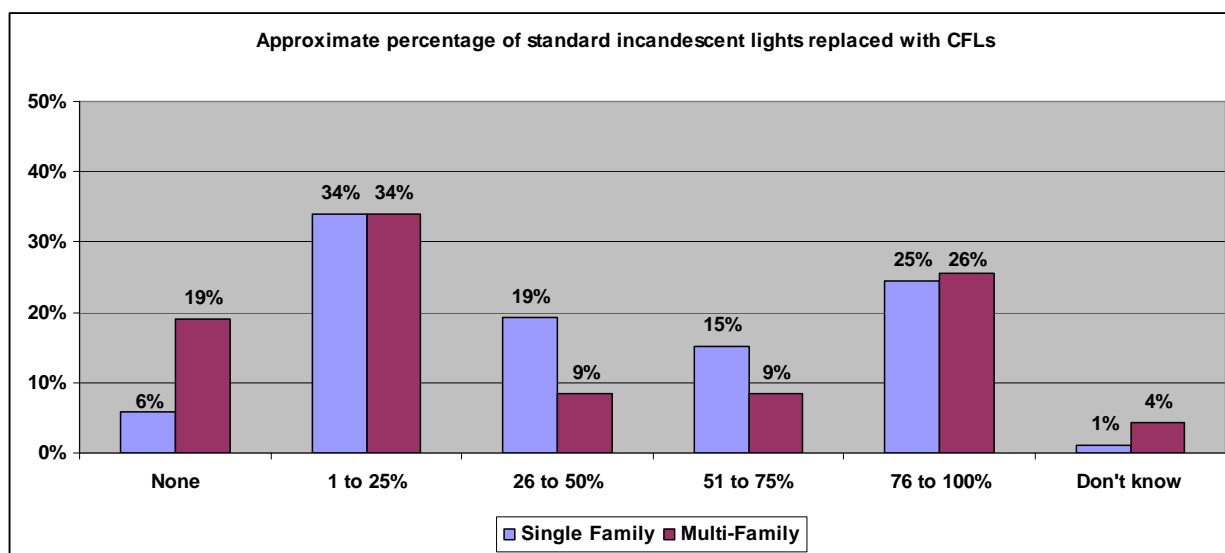
<i>How many of the following lighting products do you have in your house?</i>	<i>None</i>		<i>1 – 5</i>		<i>6 – 10</i>		<i>11 – 15</i>		<i>More than 15</i>		<i>Don't Know</i>		<i>Total</i>	
	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>
CFL Bulbs	44	16%	78	29%	67	25%	37	14%	35	13%	7	3%	268	100%
Standard incandescent light bulbs	49	16%	82	27%	74	25%	37	12%	46	15%	12	4%	300	100%
Fluorescent tube lights	140	47%	118	39%	27	9%	6	2%	1	0%	8	3%	300	100%
Halogen floor lamps	244	81%	52	17%	1	0%	0	0%	0	0%	3	1%	300	100%
Fluorescent floor lamps	268	89%	28	9%	1	0%	0	0%	0	0%	3	1%	300	100%
Indoor lighting controls (e.g., sensors, timers)	222	74%	71	24%	4	1%	0	0%	1	0%	2	1%	300	100%
Outdoor security/flood lights	92	31%	189	63%	11	4%	2	1%	1	0%	5	2%	300	100%
Outdoor lighting controls (e.g., sensors, timers)	156	52%	136	45%	2	1%	1	0%	0	0%	5	2%	300	100%
LED lights	250	83%	20	7%	4	1%	0	0%	0	0%	26	9%	300	100%

Respondents who previously purchased a compact fluorescent light bulb indicate a wide distribution of responses in regards to the approximate percentage of standard incandescent light bulbs they replaced with CFLs. Even though 45% of residents have replaced less than a quarter of their standard incandescent lights with CFLs, 25% have replaced three quarters or more of their standard incandescent lights with CFLs

Table 3-127: Standard Incandescent Lights Replaced with CFLs

<i>Approximately what percentage of standard incandescent lights have you replaced with compact fluorescent lights?</i>	Single Family		Multi-Family		Total	Total
	N	%	N	%	N	%
None	10	6%	9	19%	19	9%
1 to 25%	58	34%	16	34%	74	34%
26 to 50%	33	19%	4	9%	37	17%
51 to 75%	26	15%	4	9%	30	14%
76 to 100%	42	25%	12	26%	54	25%
Don't know	2	1%	2	4%	4	2%
Total	171	100%	47	100%	218	100%

Figure 3-126: Standard Incandescent Lights Replaced with CFLs

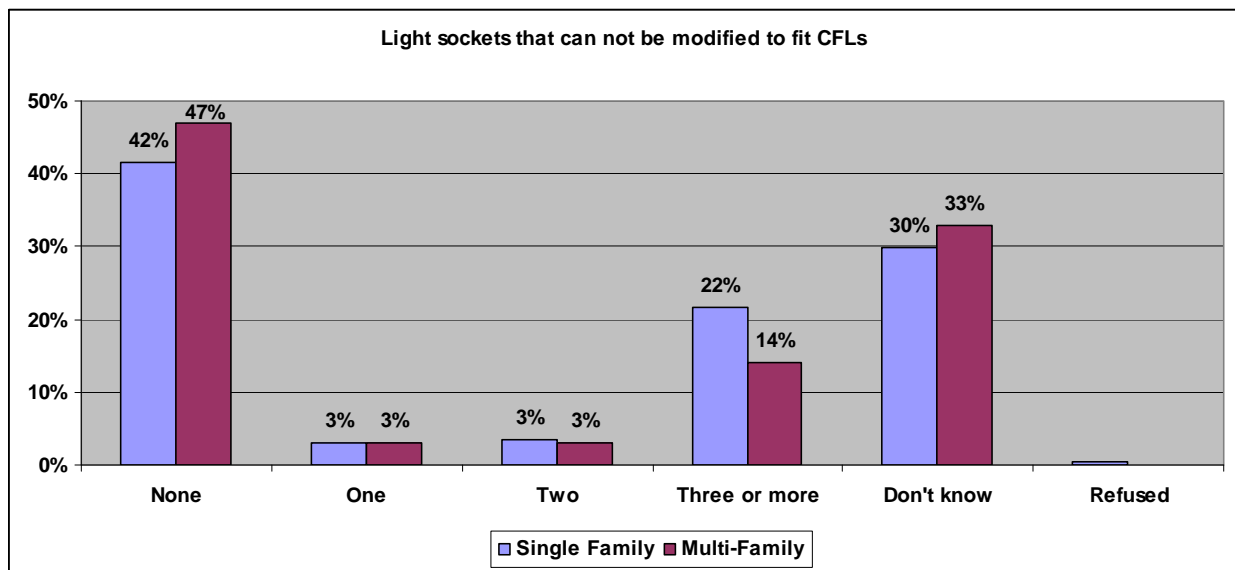


In terms of light sockets that cannot be modified to fit CFLs, only 14% of respondents who previously purchased a compact fluorescent light bulb report having three or more sockets that cannot be modified to fit CFLs.

Table 3-128: Light sockets that can not be modified to fit compact fluorescent lights

<i>How many light sockets do you have that can <u>not</u> be modified to fit compact fluorescent lights?</i>	Single Family		Multi-Family		Total	Total
	N	%	N	%	N	%
None	85	42%	30	47%	115	9%
One	6	3%	2	3%	8	34%
Two	7	3%	2	3%	9	17%
Three or more	44	22%	9	14%	53	14%
Don't know	61	30%	21	33%	82	25%
Refused	1	0%	0	0%	1	2%
Total	204	100%	64	100%	268	100%

Figure 3-127: Light sockets that can not be modified to fit compact fluorescent lights



3.11 Pools

All respondents were asked to indicate whether or not they owned a swimming pool. No multi-family respondent reported ownership of a pool. The tables and figures below present a high level summary of the information collected on swimming pools at single family dwellings.

Table 3-129: Pool Ownership

<i>Do you have a pool?</i>	Single Family		Multi-Family		Total	Total
	N	%	N	%	N	%
Yes, it is for the private use of this house	38	17%	0	0%	38	13%
Yes, but it is in a common area for use	0	0%	1	1%	1	0%
No	183	82%	75	96%	258	86%
Don't know	0	0%	2	3%	2	1%
Refused	1	0%	0	0%	1	0%
Total	222	100%	78	100%	300	100%

Figure 3-128: Pool Ownership

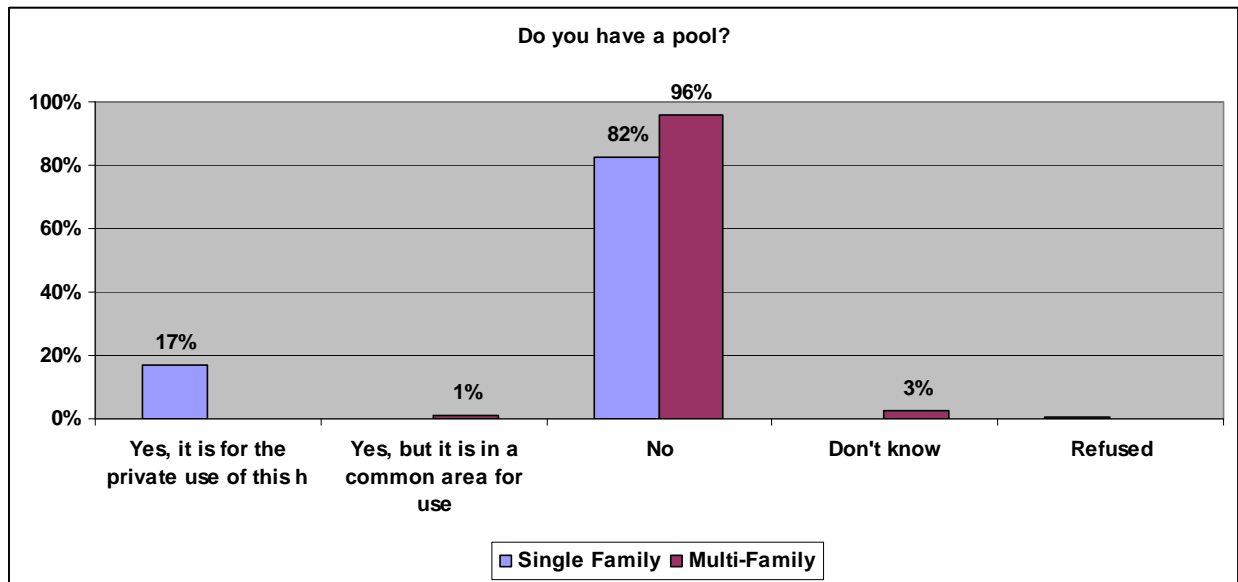


Table 3-130: Pool Location

<i>Where is the pool located?</i>	Single Family	
	N	%
Outside of the home	38	100%

Table 3-131: Pool Type

<i>Is the pool above ground or in ground?</i>	Single Family	
	N	%
Above ground	24	63%
In ground	14	37%
Total	38	100%

Figure 3-129: Pool Location

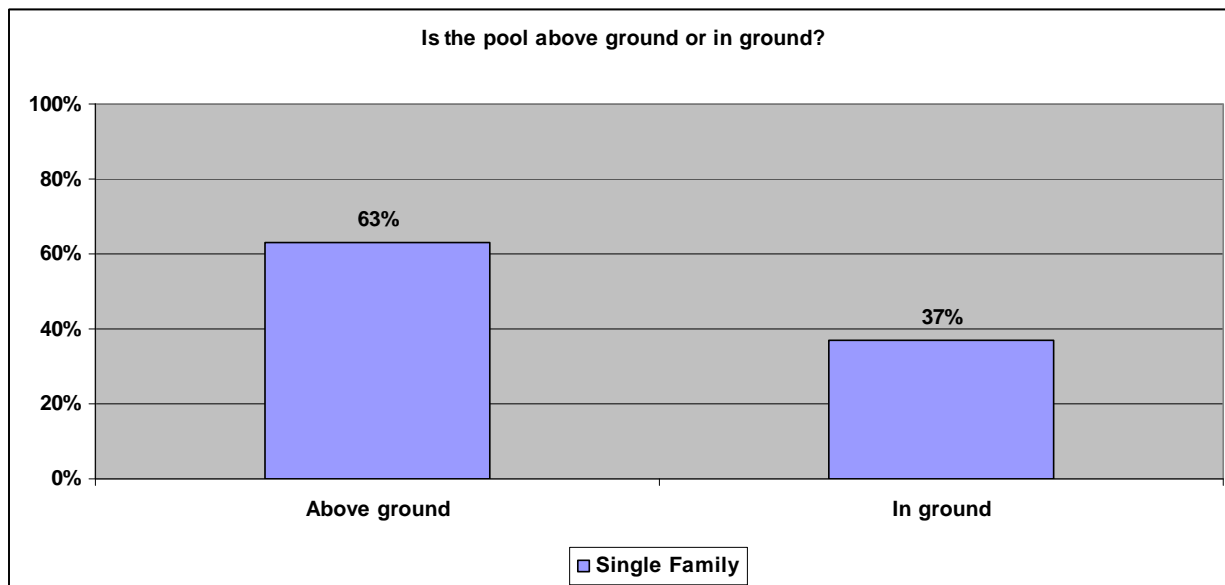


Table 3-132: Pool Pump Use

<i>Do you use a pump to clean your pool?</i>	Single Family	
	N	%
Yes	36	95%
No	2	5%
Total	38	100%

Figure 3-130: Pool Pump Use

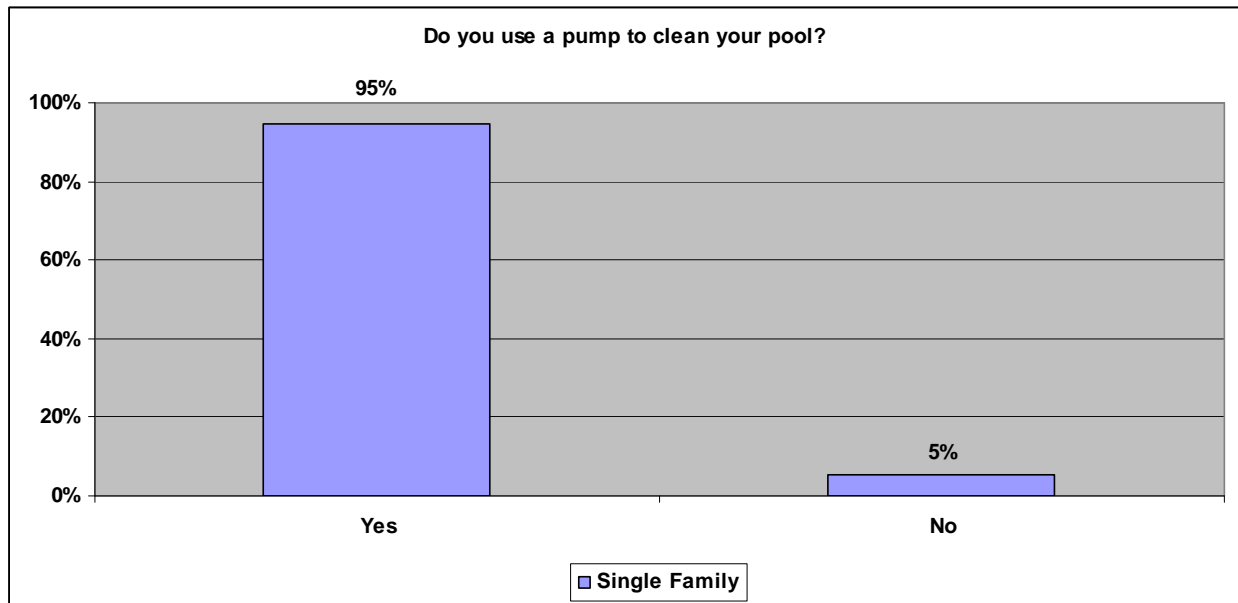


Table 3-133: VSD Pool Pumps

Does your pool pump use a variable speed drive?	Single Family	
	N	%
Yes	5	14%
No	19	53%
Don't Know	12	33%
Total	36	100%

Figure 3-131: VSD Pool Pumps

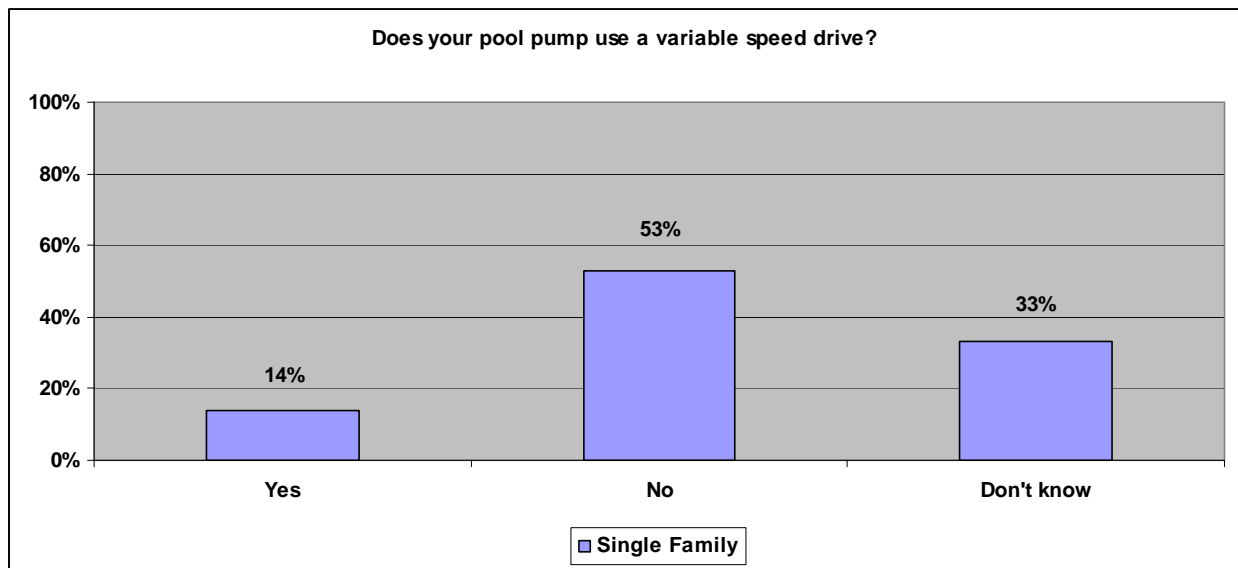


Table 3-134: Pool Pumps Timers

<i>Do you use a timer with your pool pump?</i>	Single Family	
	N	%
Yes	11	31%
No	25	69%
Total	36	100%

Figure 3-132: Pool Pumps Timers

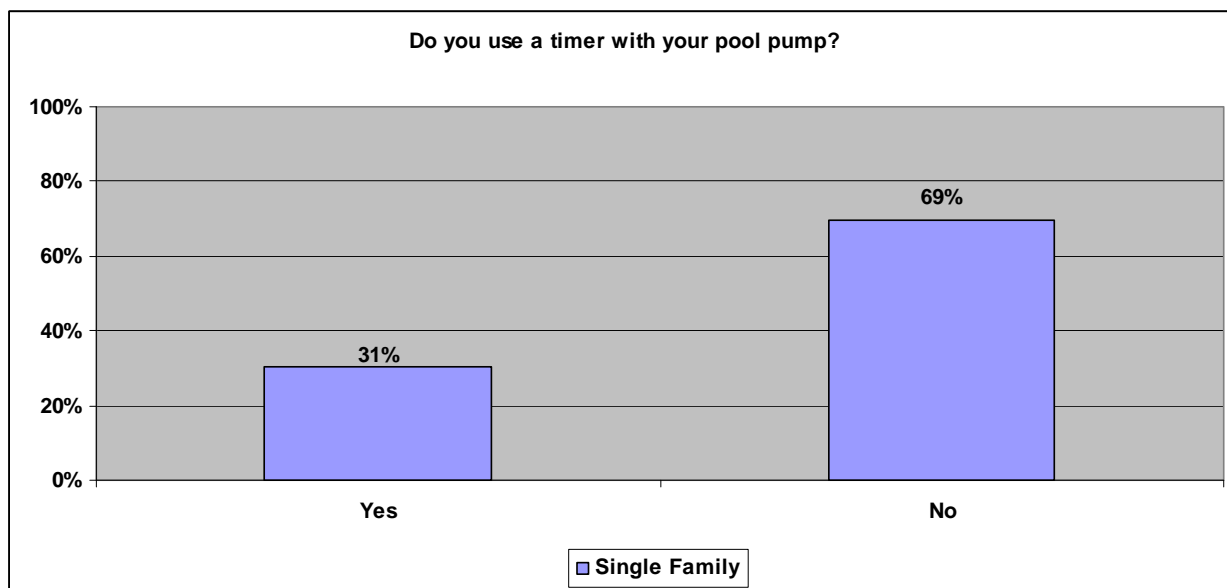
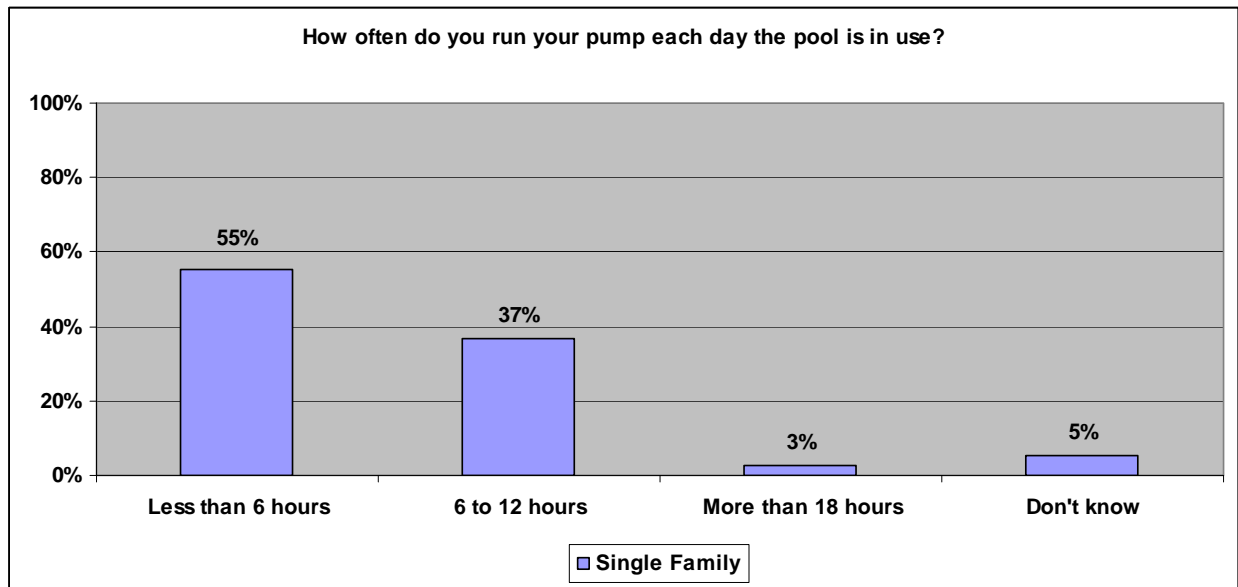


Table 3-135: Pool Pumps Time of Use

How often do you run your pump each day the pool is in use?	Single Family	
	N	%
Less than 6 hours	21	55%
6 to 12 hours	14	37%
More than 18 hours	1	3%
Don't know	2	5%
Total	38	100%

Figure 3-133: Pool Pumps Time of Use



3.12 Appliances

Respondents were asked about a variety of electronics used in their home. Table 3-136 displays data collected on residential electronics and appliances.

Table 3-136: Ownership of Home Electronics and Appliances

How many of the following appliances do you own?	None		One		Two		Three or		Don't Know		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
Multi-function machine (e.g., All-in-1 print/copy/fax)	165	55%	110	37%	16	5%	7	2%	2	1%	300	100%
Printer	145	48%	131	44	17	6%	6	2%	1	0%	300	100%
Copier	219	73%	74	25%	5	2%	1	0%	1	0%	300	100%
Plasma screen TV	241	80%	43	14%	13	4%	2	1%	1	0%	300	100%
LCD TV	183	61%	74	25%	26	9%	8	3%	8	3%	300	100%
Other types of TVs	68	23%	86	29%	81	27%	60	20%	4	1%	300	100%
Portable Fan	112	37%	71	24%	56	19%	55	18%	5	2%	300	100%

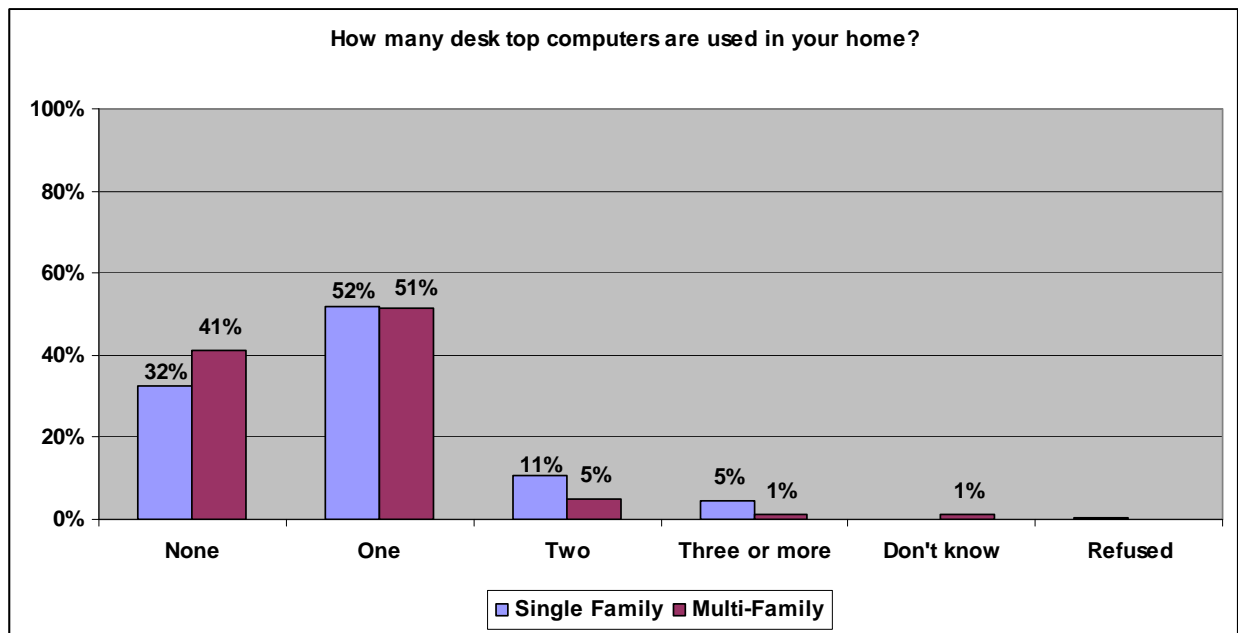
<i>How many of the following appliances do you own?</i>	None		One		Two		Three or		Don't Know		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
Electric attic fan	256	85%	28	9%	3	1%	3	1%	9	3%	300	100%
Whole-house fan	232	77%	30	10%	7	2%	18	6%	12	4%	300	100%
Humidifier	239	80%	52	17%	5	2%	1	0%	2	1%	300	100%
Wine or beverage cooler	287	96%	10	3%	1	0%	1	0%	1	0%	300	100%
Water purification system	252	84%	42	14%	3	1%	2	1%	1	0%	300	100%
Aquarium	278	93%	16	5%	3	1%	1	0%	1	0%	300	100%
Trash compactor	288	96%	9	3%	-	-	-	-	1	0%	300	100%
Sauna (electric)	292	97%	5	2%	-	1%	-	0%	2	0%	300	100%
Electronic security system	240	80%	54	18%	-	-	-	-	2	1%	300	100%
Electric garage door opener	189	63%	89	30%	18	6%	2	1%	1	0%	300	100%
Lawn mower (electric)	275	92%	21	7%	-	-	-	-	3	1%	300	100%
Electronic household air cleaner	280	93%	15	5%	2	1%	-	-	2	1%	300	100%
Chargers left plugged in (e.g., phone, camera, batteries)	129	43%	58	19%	54	18%	56	19%	2	1%	300	100%
Coffee pot left plugged in	169	56%	125	42%	2	1%	2	1%	1	0%	300	100%
Cable box	90	30%	105	35%	62	21%	40	13%	2	1%	300	100%
DVD and/or VCR	54	18%	137	46%	87	29%	19	6%	1	0%	300	100%
Video game console(s)	220	73%	52	17%	17	6%	9	3%	1	0%	300	100%

Sixty-five percent of respondents report owning one or more desktop computers. The distribution appears similar for both single and multi-family homes.

Table 3-137: Desktop Computer Ownership

<i>How many desk top computers are used in your home?</i>	<i>Single Family</i>		<i>Multi-Family</i>		<i>Total</i>	
	<i>N</i>	<i>SF%</i>	<i>N</i>	<i>MF%</i>	<i>N</i>	<i>%</i>
None	72	32%	32	41%	104	35%
One	115	52%	40	51%	155	52%
Two	24	11%	4	5%	28	9%
Three or more	10	5%	1	1%	11	4%
Don't know	0	0%	1	1%	1	0%
Refused	1	0%	0	0%	1	0%
Total	222	100%	78	100%	300	100%

Figure 3-134: Desktop Computer Ownership

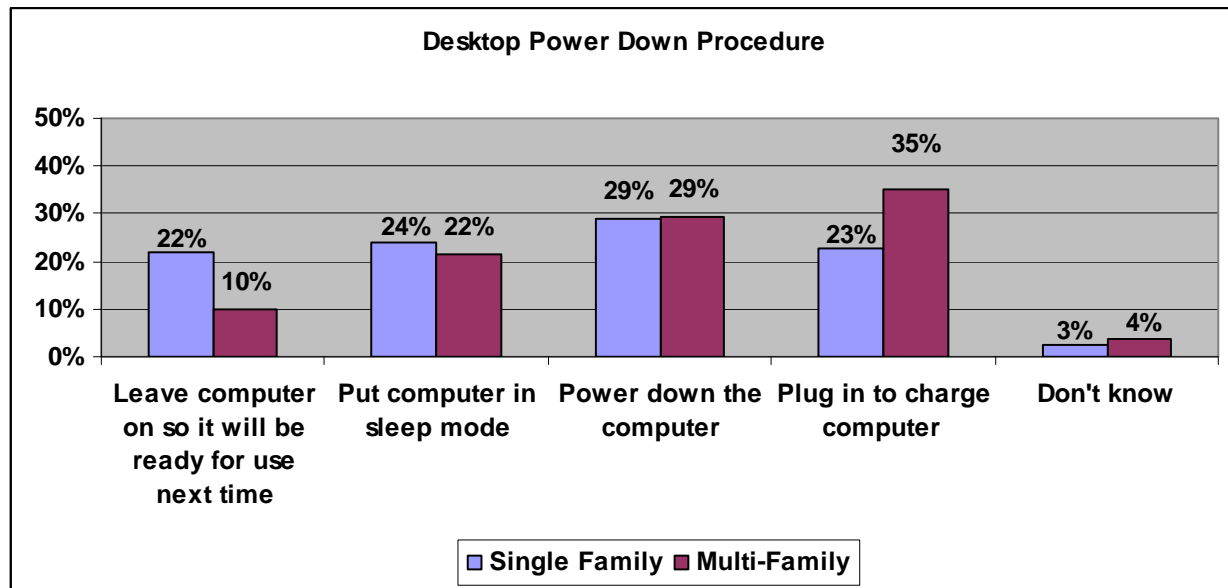


In terms of shut down procedures, less than a third of respondents (29%) report turning off their computer when not being used.

Table 3-138: Desktop Computer Shut Down Procedures

<i>Which of the following describes what usually happens when done using a desk top computer(s)?</i>	<i>Single Family</i>		<i>Multi-Family</i>		<i>Total</i>	
	<i>N</i>	<i>SF%</i>	<i>N</i>	<i>MF%</i>	<i>N</i>	<i>%</i>
Leave computer on so it will be ready for use next time	42	22%	5	10%	47	19%
Put computer in sleep mode	46	24%	11	22%	57	23%
Power down the computer	56	29%	15	29%	71	29%
Plug in to charge computer	44	23%	18	35%	62	25%
Don't know	5	3%	2	4%	7	3%
Total	193	100%	51	100%	244	100%

Figure 3-135: Desktop Computer Shut Down Procedures

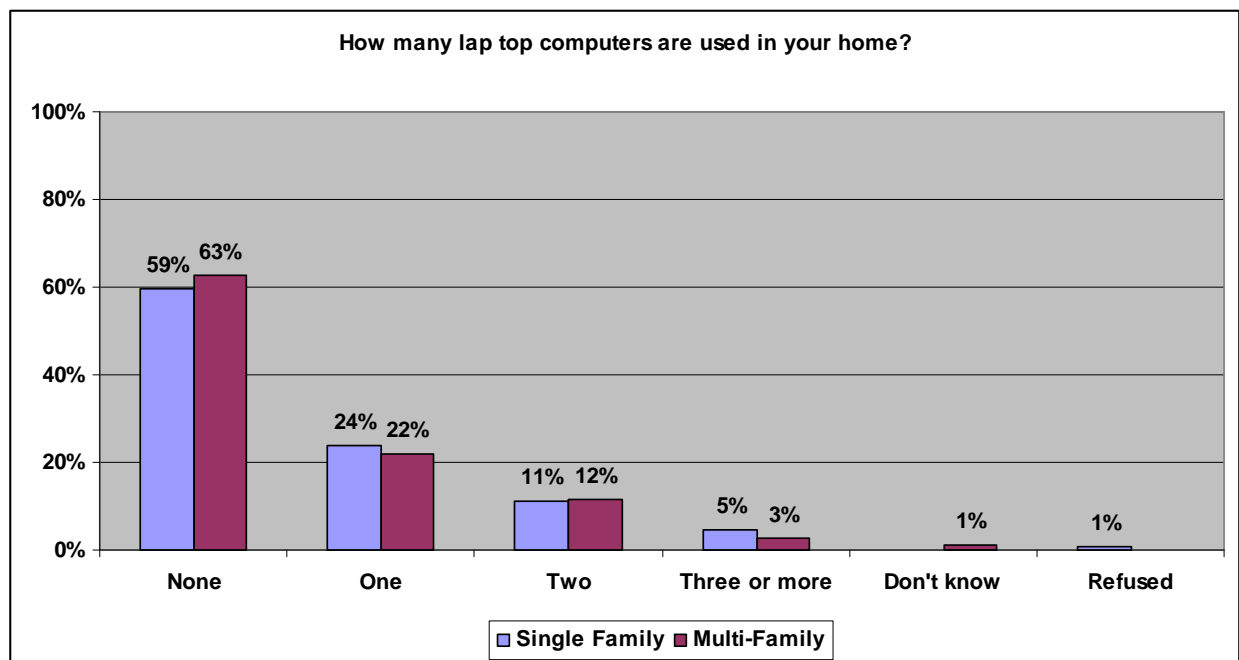


Thirty eight percent of respondents (60%) report owning one or more laptop computers.

Table 3-139: Laptop Computer Ownership

<i>How many laptop computers are used in your home?</i>	<i>Single Family</i>		<i>Multi-Family</i>		<i>Total</i>	
	<i>N</i>	<i>SF%</i>	<i>N</i>	<i>MF%</i>	<i>N</i>	<i>%</i>
None	132	59%	49	63%	181	60%
One	53	24%	17	22%	70	23%
Two	25	11%	9	12%	34	11%
Three or more	10	5%	2	3%	12	4%
Don't know	0	0%	1	1%	1	0%
Refused	2	1%	0	0%	2	1%
Total	222	100%	78	100%	300	100%

Figure 3-136: Laptop Computer Ownership

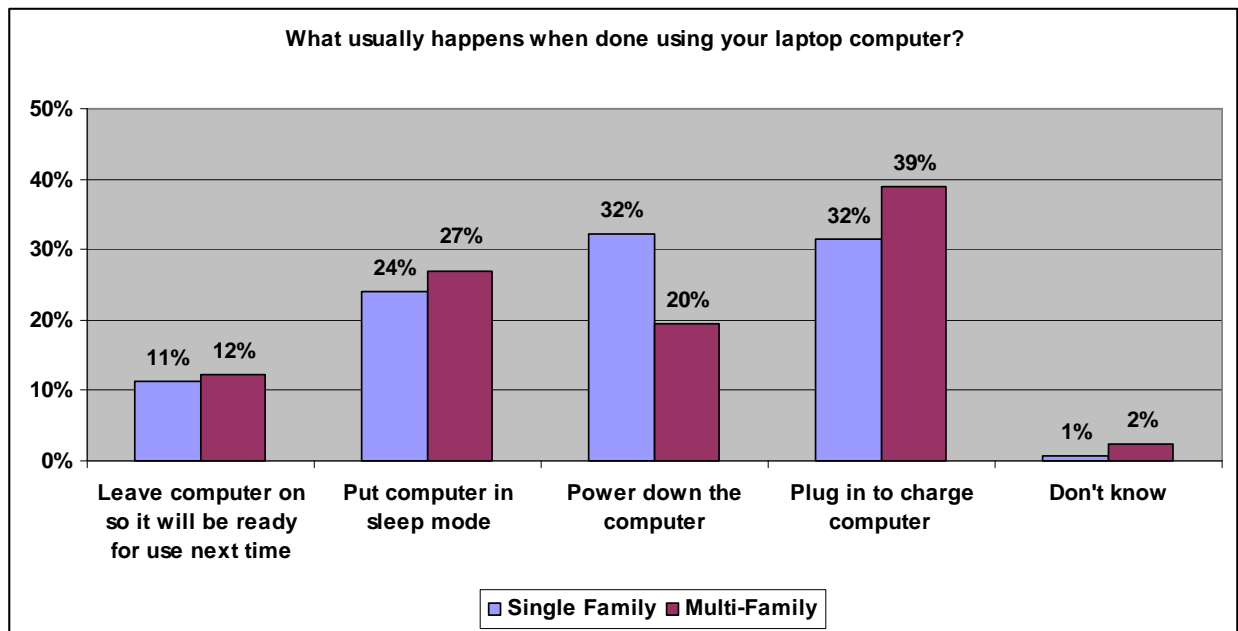


Respondents indicate a widely distributed range of actions when shutting down their lap top, with the predominant occurrence (33%) being to plug in the laptop to charge the computer.

Table 3-140: Laptop Computer Shut Down Procedures

<i>Which of the following describes what usually happens when done using a lap top commuter(s)?</i>	<i>Single Family</i>		<i>Multi-Family</i>		<i>Total</i>	
	<i>N</i>	<i>SF%</i>	<i>N</i>	<i>MF%</i>	<i>N</i>	<i>%</i>
Leave computer on so it will be ready for use next time	15	11%	5	12%	20	11%
Put computer in sleep mode	32	24%	11	27%	43	25%
Power down the computer	43	32%	8	20%	51	29%
Plug in to charge computer	42	32%	16	39%	58	33%
Don't know	1	1%	1	2%	2	1%
Total	133	100%	41	100%	174	100%

Figure 3-137: Laptop Computer Shut Down Procedures

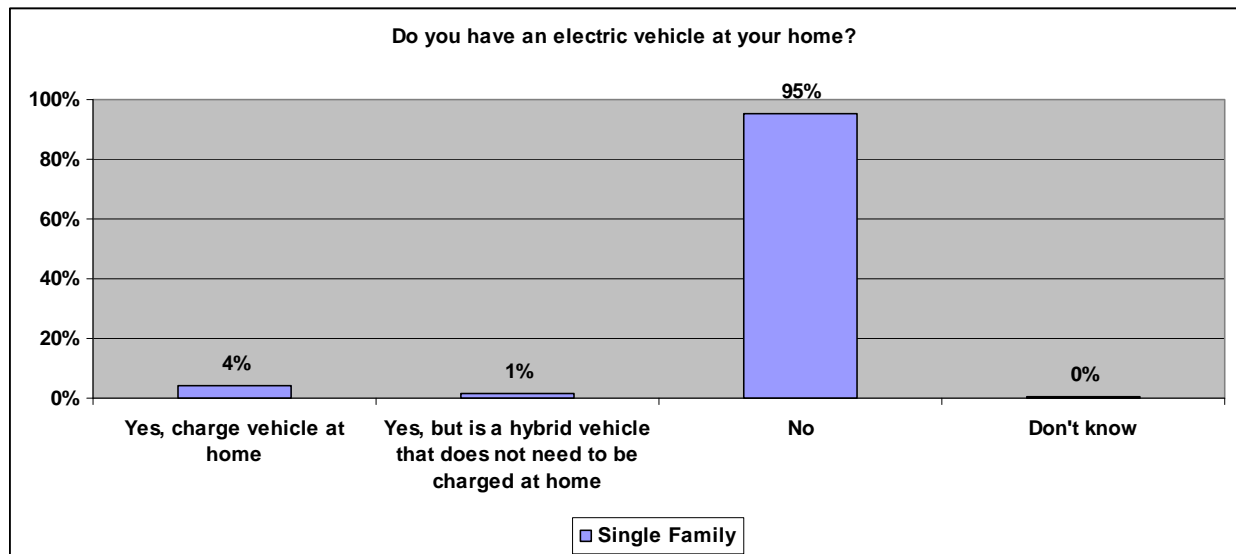


There appears to be very few electric vehicles owned by residential customers in Rhode Island.

Table 3-141: Electronic Vehicle Ownership

<i>Do you have an electric vehicle at your home (e.g., car, wheelchair, golf cart)?</i>	<i>Single Family</i>		<i>Multi-Family</i>		<i>Total</i>	
	<i>N</i>	<i>SF%</i>	<i>N</i>	<i>MF%</i>	<i>N</i>	<i>%</i>
Yes, charge vehicle at home	8	4%	0%	0.00%	8	3%
Yes, but is a hybrid vehicle that does not need to be charged at home	3	1%	0%	0.00%	3	1%
No	211	95%	78	100.00%	289	96%
Don't know	1	0%	0%	0.00%	1	0%
Total	222	100%	78	100.00%	300	100%

Figure 3-138: Electronic Vehicle Ownership



4. Demographics

All respondents were asked a series of demographic questions. Data collected are presented in Tables 4-1 through 4-4.

Table 4-1: Age

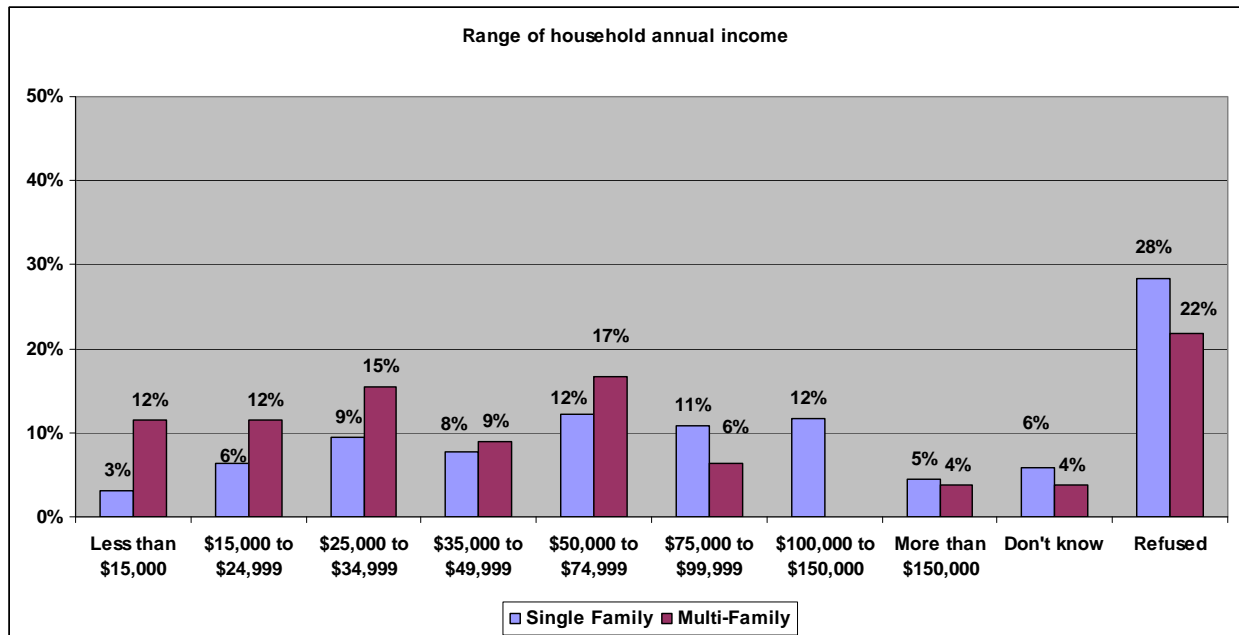
<i>How many people in each of the following groups live in this home?</i>	<i>None</i>		<i>One</i>		<i>Two</i>		<i>Three</i>		<i>Four or More</i>		<i>Don't Know</i>		<i>Refused to Answer</i>		<i>Total</i>	
	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>
Less than 12 years old	236	79%	24	8%	21	7%	9	3%	5	2%	-	-	5	2%	300	100%
12 to 17 years old	259	86%	25	8%	10	3%	-	-	1	0%	-	-	5	2%	300	100%
18 to 25 years old	238	79%	33	11%	20	7%	4	1%	-	-	-	-	5	2%	300	100%
26 to 45 years old	206	69%	39	13%	44	15%	4	1%	2	1%	-	-	5	2%	300	100%
46 to 60 years old	156	52%	60	20%	78	26%	1	0%	-	-	-	-	5	2%	300	100%
More than 60 years old	190	63%	54	18%	51	17%	-	0%	-	0%	-	0%	4	1%	300	100%

Household income appears to be widely distributed within the ranges defined in the survey. Nearly a quarter of respondents (24%) report annual total household income of less than \$35,000.

Table 4-2: Household Income

<i>Which of the following ranges best describes your household's total annual income?</i>	Single Family		Multi-Family		Total	Total
	N	%	N	%	N	%
Less than \$15,000	7	3%	9	12%	16	5%
\$15,000 to \$24,999	14	6%	9	12%	23	8%
\$25,000 to \$34,999	21	9%	12	15%	33	11%
\$35,000 to \$49,999	17	8%	7	9%	24	8%
\$50,000 to \$74,999	27	12%	13	17%	40	13%
\$75,000 to \$99,999	24	11%	5	6%	29	10%
\$100,000 to \$150,000	26	12%	0	0%	26	9%
More than \$150,000	10	5%	3	4%	13	4%
Don't know	13	6%	3	4%	16	5%
Refused	63	28%	17	22%	80	27%
Total	222	100%	78	100%	300	100%

Figure 4-1: Household Income

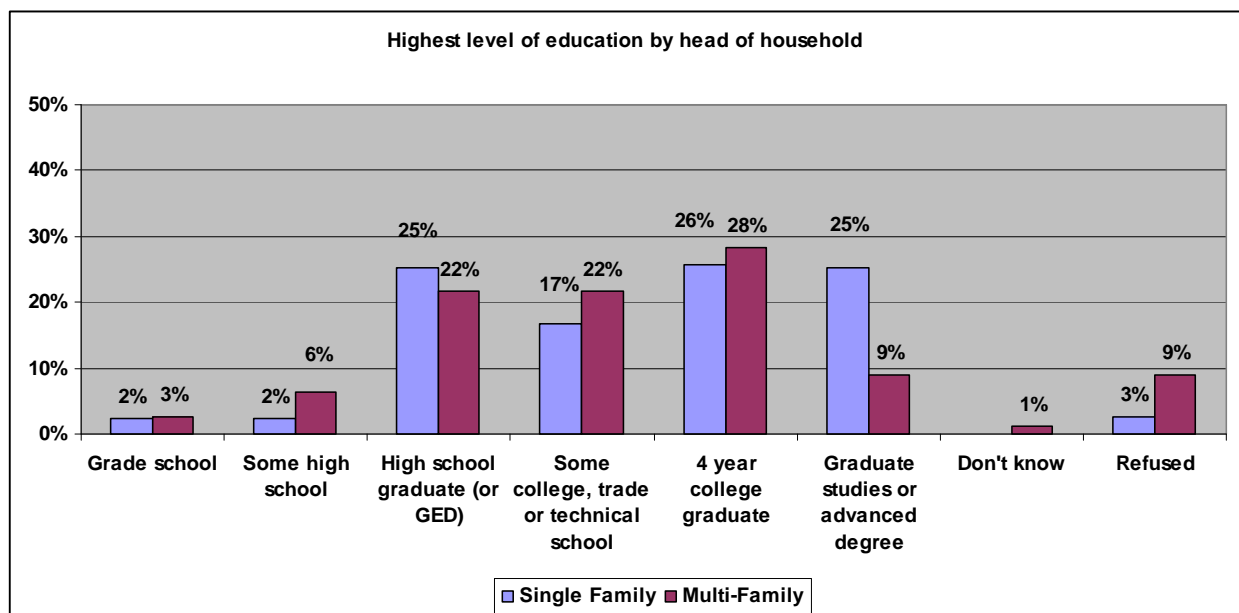


Results indicate that almost half of head of residential households (47%) have a college or graduate degree.

Table 4-3: Head of Household Education

<i>What was the highest level of education completed by any head of household in your home?</i>	Single Family		Multi-Family		Total	Total
	N	%	N	%	N	%
Grade school	5	2%	2	3%	7	2%
Some high school	5	2%	5	6%	10	3%
High school graduate (or GED)	56	25%	17	22%	73	24%
Some college, trade or technical school	37	17%	17	22%	54	18%
4 year college graduate	57	26%	22	28%	79	26%
Graduate studies or advanced degree	56	25%	7	9%	63	21%
Don't know	0	0%	1	1%	1	0%
Refused	6	3%	7	9%	13	4%
Total	222	100%	78	100%	300	100%

Figure 4-2: Head of Household Education

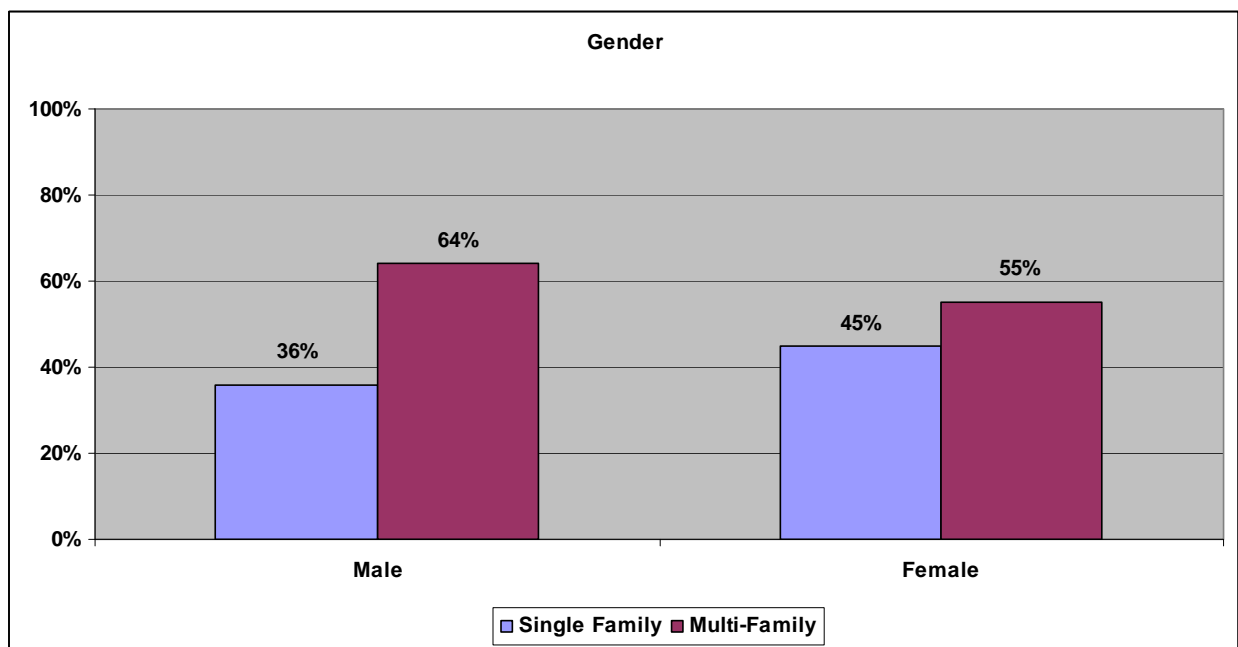


The majority of respondents were female.

Table 4-4: Gender

Gender	Single Family		Multi-Family		Total	Total
	N	%	N	%	N	%
Male	80	36%	35	45%	115	38%
Female	142	64%	43	55%	185	62%
Total	222	100%	78	100%	300	100%

Figure 4-3: Gender



Commercial and Industrial On- Sites

Commercial / Industrial On-Sites

KEMA conducted on-site surveys of a sample of commercial and industrial customers to support the energy efficiency potential study. The on-sites were designed to collect the data required for DSM Assyst to develop the estimates of potential. On- survey results are presented in Appendix G. This data includes:

- Saturation of energy end-uses by type
- Penetration of energy efficient equipment by end use
- Trends in energy efficiency purchase behavior
- Awareness and interest in National Grid program offerings

Commercial / Industrial Methodology

Building types were assigned to the population based on SIC codes provided in the tracking data by National Grid. In the first data set provided by National Grid, SIC codes were missing for over 60% of the accounts in the population. After discussion on how to handle this difficulty with various sample design techniques, National Grid was able to provide SIC codes for accounts in the population that they purchased from a secondary source. A final combined dataset was created that merged the two sources of SIC code information to the population.

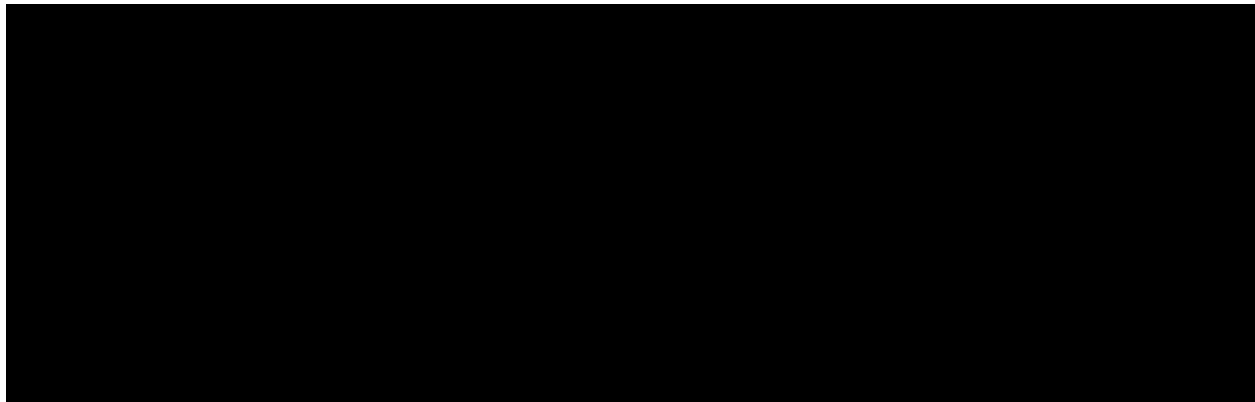
Table 4-5 shows a list of the total number of accounts dropped as well as the contribution of those accounts to the total energy in the program. For the final sample design, accounts with less than 5,000 annual kWh were removed from the population because there is very little potential for savings from accounts that small. Accounts less than 5,000 annual kWh accounted for less than 0.5% of the total program annual kWh. Accounts that were dropped due to small usage came from all building categories but the two largest categories were office and retail. It was decided not to include the agricultural building type in this analysis because a large percentage of this category contained inaccurate SIC codes and because agricultural accounts represented only 0.3% of the annual kWh for the program.

Table 4-5: Dropped Accounts Summary

	n obs	% of sites in Population	annual kwh	% of total annual kWh
No SIC code	17,417	31.3%	368,639,838	8.3%
kWh < 5000	12,255	22.0%	31,522,303	0.7%
AG	479	0.9%	14,601,568	0.3%
Total Dropped	30,151	54.2%	414,763,709	9.3%

The remaining population file after screening contained 25,448 accounts that were grouped into thirteen building categories. Table 4-6 shows the summary statistics of the final nonresidential population file. The commercial category with the largest contribution to annual consumption was office buildings with over 1,000 GWh and the largest industrial category was assembly industrial which accounted for nearly 1,000 GWh.

Table 4-6: Nonresidential Population Summary (in kWh)



A total of 150 accounts were initially selected for the nonresidential sample, 108 commercial accounts and 42 industrial accounts. Table 4-7 shows the sample size and number of strata for each of the 13 chosen building categories. Sample sizes were selected to optimally allocate accounts by building type based on their contribution to the total nonresidential load. This is why offices and assembly facilities have the most sample points for commercial and industrial sectors respectively. A minimum of 4 accounts was set for each business type to ensure adequate survey information to be provided for modeling.

Table 4-7: Sample Size and Number of Strata by Building Type

Business Type	Sample Size	Strata
Office	24	4
Restaurant	9	2
Grocery	8	2
Retail	16	4
Warehouse	6	2
Health	7	3
School	7	2
College	6	2
Lodging	4	1
Commercial Misc.	13	3
Assembly Industrial	35	5
Process Industrial	7	2
Trans, Commun, Utility	8	2

The tracking data will very likely include accounts that contain inaccurate SIC code mapping designations. While conducting the onsite surveys, the true building type for each account included in the sample will be confirmed or modified compared to the tracking database. For accounts that are mislabeled, KEMA will keep track of the original building type designation as well as the true building type. When conducting the analysis, accounts that were mislabeled will maintain their original weight based on the tracking data assigned building code from the sample design, but be extrapolated back to the population using the true building type. In this way the results will represent the distribution of the true building type within the utility and not the distribution based on the SIC building type mapping that contain incorrect building assignments.

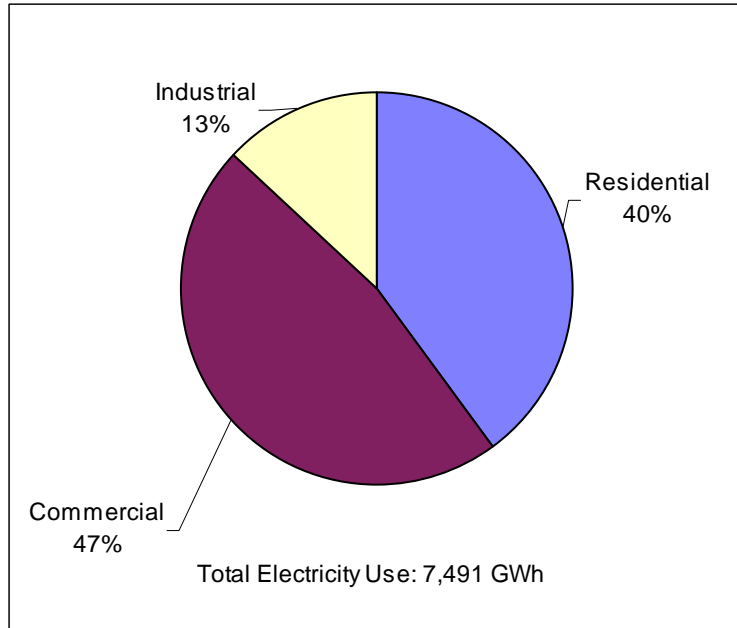
Weights were recalculated after the onsite surveys were completed to reflect the sites that were able to be recruited into the sample. A total of 149 accounts were recruited out of the initial target of 150. Based on the parameters outlined in Table 4-7, strata cut points were selected using model-based stratification. Table 4-8 shows the resulting strata cut points by business type and the associated weight for each business type and stratum combination.

Table 4-8: Strata Cut Points by Business Type-- in Annual kWh

Business Type	Stratum	Strata Cutpoint (annual kwh)	Accounts in Pop	Total kwh in Strata	Sites in Sample	Weight
Office	1	63,100	6,859	130,924,543	6	1,143
Office	2	361,800	1,373	191,229,221	6	229
Office	3	1,800,942	351	266,553,284	6	59
Office	4	106,649,000	79	432,612,806	6	13
Restuarant	1	144,210	1,690	83,053,057	5	338
Restuarant	2	5,169,277	390	118,797,579	4	98
Grocery	1	612,960	817	75,048,879	4	204
Grocery	2	3,995,250	65	134,092,850	4	16
Retail	1	41,561	3,383	52,869,191	4	846
Retail	2	154,081	932	71,648,332	4	233
Retail	3	774,000	302	95,522,582	4	76
Retail	4	23,344,000	62	153,336,998	4	16
Warehouse	1	454,320	534	47,678,770	3	178
Warehouse	2	10,020,000	50	87,564,234	3	17
Health	1	345,520	1,321	44,228,602	4	330
Health	2	2,144,700	87	78,748,590	1	87
Health	3	44,448,218	15	135,642,913	2	8
School	1	440,000	401	48,557,753	4	100
School	2	2,551,400	74	68,877,240	3	25
College	1	4,616,000	178	71,073,214	4	45
College	2	70,490,482	6	164,122,010	2	3
Lodging	1	6,860,000	176	81,756,917	4	44
Commercial Miscellaneous	1	86,341	1,293	29,952,840	4	323
Commercial Miscellaneous	2	543,600	225	44,747,662	6	38
Commercial Miscellaneous	3	30,304,768	40	82,769,809	3	13
Assembly Industrial	1	357,600	1,595	100,392,386	8	199
Assembly Industrial	2	1,232,900	215	147,283,884	7	31
Assembly Industrial	3	3,526,400	89	182,616,664	8	11
Assembly Industrial	4	7,552,800	43	221,525,496	9	5
Assembly Industrial	5	96,510,341	13	317,519,435	2	7
Process Industrial	1	198,480	941	25,294,331	4	235
Process Industrial	2	2,834,000	67	47,710,584	3	22
Transport, Communications, Utility	1	621,300	1,727	64,669,388	4	432
Transport, Communications, Utility	2	23,420,810	55	145,298,613	4	14

Selected Commerical Results

The figure below presents overall energy sales for Rhode Island for reference. Commerical is the largest sector of energy sales in Rhode Island with 47 percent of the energy sold.



The following tables present selected Commerical results.

Building Type	N	% of Commercial Buildings in Rhode Island
Office	22	31%
Restaurant	8	9%
Retail	19	30%
Grocery	6	3%
Warehouse	10	12%
School	9	4%
College	3	0%
Health	6	4%
Lodging	4	1%
Miscellaneous	17	7%
Total	104	100%

Building Type	N	Average floor area occupied by business (sq ft)
Office	22	12,110
Restaurant	8	4,068
Retail	19	5,015
Grocery	6	4,770
Warehouse	10	24,171
School	9	47,637
College	3	575,543
Health	6	11,759
Lodging	4	10,525
Miscellaneous	17	19,632

Age of Building Type

Building Type	N	Before 1950	1950 to 1979	1980 to 1989	1990 to 1999	2000 to 2004	2005 to 2009
Office	22	66%	8%	5%	5%	3%	13%
Restaurant	8	22%	34%	39%	0%	5%	0%
Retail	19	19%	57%	7%	17%	0%	0%
Grocery	6	62%	2%	2%	33%	0%	0%
Warehouse	10	15%	76%	7%	8%	0%	0%
School	9	53%	38%	0%	10%	0%	0%
College	3	88%	6%	6%	0%	0%	0%
Health	6	2%	47%	51%	0%	0%	0%
Lodging	4	50%	25%	0%	0%	0%	25%
Miscellaneous	17	44%	36%	2%	14%	0%	3%
Total	104	38%	37%	10%	10%	2%	4%

Does the Customer Pay the Electric Bill?

Building Type	N	Yes, company pays all	Yes, company pays a portion
Office	22	96%	3%
Restaurant	8	100%	0%
Retail	19	100%	0%
Grocery	6	100%	0%
Warehouse	10	99%	0%
School	9	100%	0%
College	3	100%	0%
Health	6	100%	0%
Lodging	4	100%	0%
Miscellaneous	17	100%	0%
Total	104	99%	1%

Is the space leased or owned ?

Building Type	N	Owner	Lessee Tenant	Own a part and lease the remainder	Other situation
Office	22	90%	6%	0%	3%
Restaurant	8	49%	51%	0%	0%
Retail	19	34%	63%	3%	0%
Grocery	6	93%	7%	0%	0%
Warehouse	10	99%	0%	0%	0%
School	9	100%	0%	0%	0%
College	3	100%	6%	0%	0%
Health	6	60%	0%	40%	0%
Lodging	4	100%	0%	0%	0%
Miscellaneous	17	59%	27%	0%	14%
Total	104	68%	27%	2%	2%

Type of Space Heat

Building Type	% with Electricity	% with Natural Gas	% with Oil	% with Kerosene	% with Bottled Gas or Propane	% with Wood	% with Coal	% with Solar	% with Other Fuel
Office	38%	54%	42%	0%	0%	0%	0%	0%	0%
Restaurant	26%	68%	12%	0%	0%	0%	0%	0%	0%
Retail	10%	79%	14%	0%	0%	1%	0%	0%	0%
Grocery	2%	69%	0%	0%	31%	0%	0%	0%	0%
Warehouse	7%	76%	24%	0%	0%	0%	0%	0%	0%
School	3%	88%	23%	0%	0%	0%	0%	0%	0%
College	6%	100%	0%	0%	0%	0%	0%	0%	0%
Health	51%	59%	7%	0%	0%	0%	0%	0%	1%
Lodging	100%	25%	25%	0%	0%	0%	0%	0%	0%
Miscellaneous	7%	65%	38%	0%	1%	0%	0%	0%	0%
Total	21%	68%	25%	0%	1%	0%	0%	0%	0%

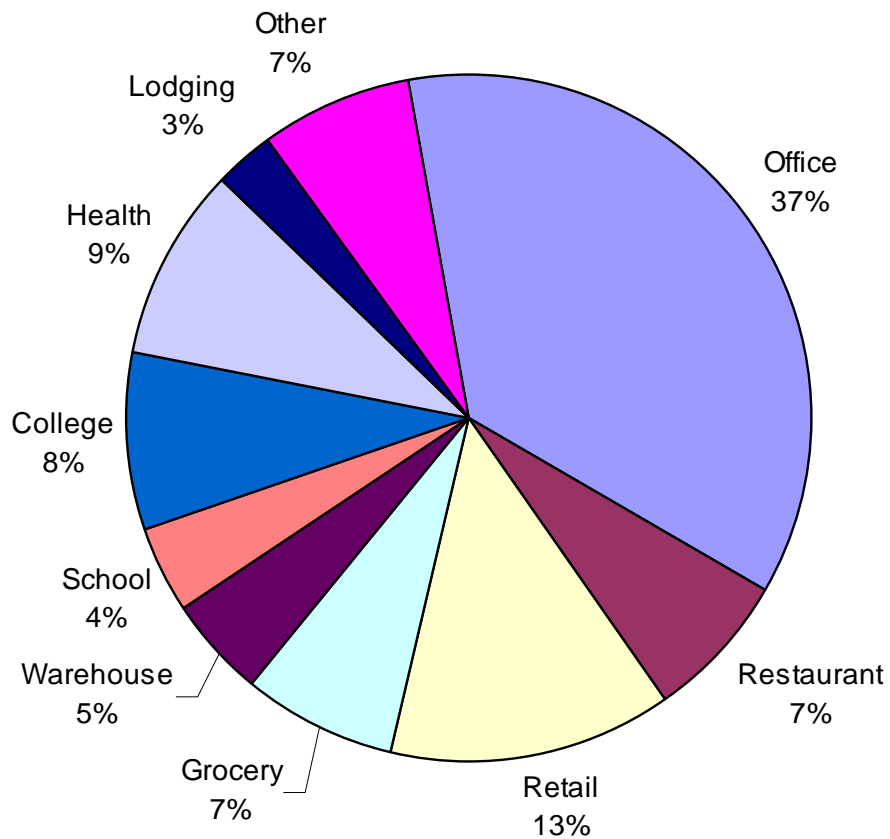
Cooling Equipment

Building Type	Water Chiller	Air Chiller	Package HP	DX	DX split	Absorption Chiller	PTAC	Individual Room AC	District Chilled water	Other Cooling Equipment
All	19.9%	14.7%	8.0%	47.0%	48.2%	4.2%	8.1%	24.0%	0.0%	1.4%
Office	25.0%	6.4%	2.6%	14.1%	35.4%	7.7%	13.7%	29.5%	0.0%	5.4%
Restaurant	0.0%	0.0%	25.5%	54.7%	25.8%	0.0%	0.0%	0.0%	0.0%	0.0%
Retail	0.0%	0.0%	10.6%	58.2%	57.1%	0.0%	15.6%	5.5%	0.0%	0.0%
Grocery	0.0%	0.0%	0.0%	73.5%	55.9%	0.0%	0.0%	26.5%	0.0%	0.0%
Warehouse	0.0%	0.0%	0.0%	63.8%	16.5%	0.0%	3.4%	18.7%	0.0%	0.0%
School	0.0%	22.4%	0.0%	32.4%	78.8%	0.0%	0.0%	9.9%	0.0%	0.0%
College	100.0%	77.7%	14.8%	77.7%	100.0%	14.8%	14.8%	85.2%	0.0%	0.0%
Health	26.6%	12.3%	52.3%	85.4%	30.1%	12.3%	0.0%	26.6%	0.0%	0.0%
Lodging	0.0%	0.0%	36.3%	93.1%	58.8%	0.0%	58.8%	39.2%	0.0%	0.0%
Miscellaneous	26.6%	24.5%	4.8%	54.4%	73.0%	0.0%	0.0%	6.4%	0.0%	0.0%

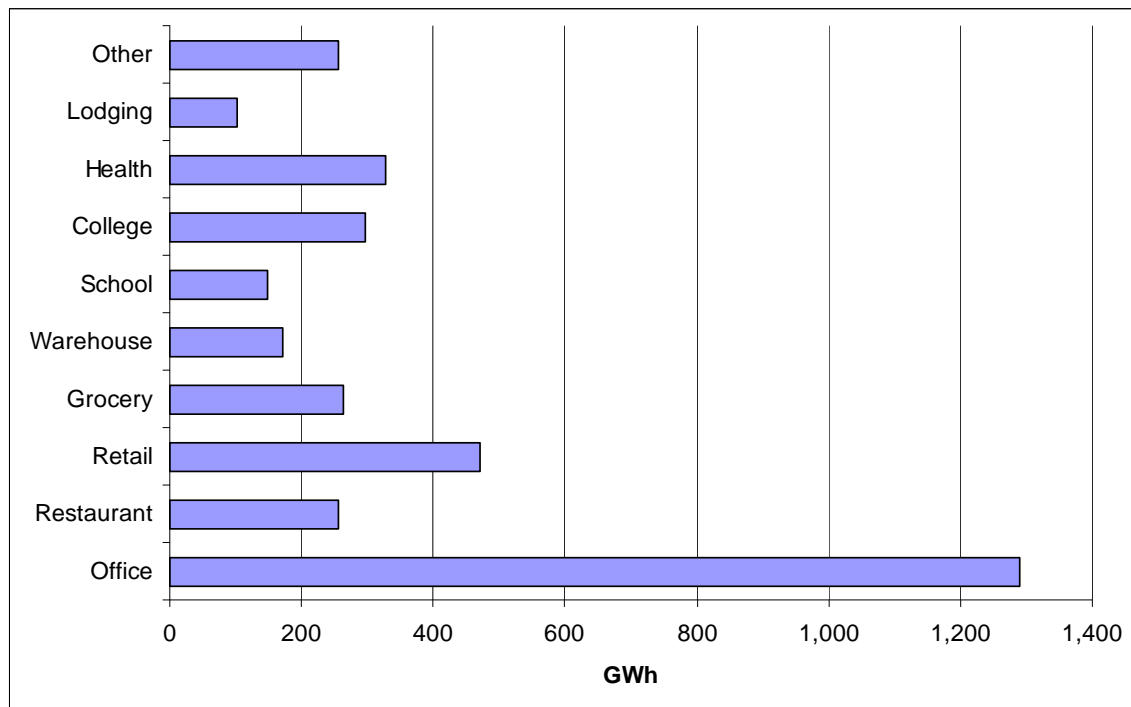
Interior Lighting Overview

Business Type	# of Buildings in Sample	% with High Performance T8 Fixtures (4 foot fixtures; 1 or 2 lamps)	% with High Performance T8 Fixtures (4 foot fixtures; 3 or more lamps)	% with High Performance T8 Fixtures (8 foot fixtures; any # of lamps)
Office	22	18%	18%	5%
Restaurant	8	0%	25%	0%
Retail	19	21%	21%	0%
Grocery	6	17%	0%	0%
Warehouse	10	10%	10%	30%
School	9	0%	11%	0%
College	3	67%	67%	0%
Health	6	17%	17%	0%
Lodging	4	0%	0%	0%
Miscellaneous	17	24%	18%	6%

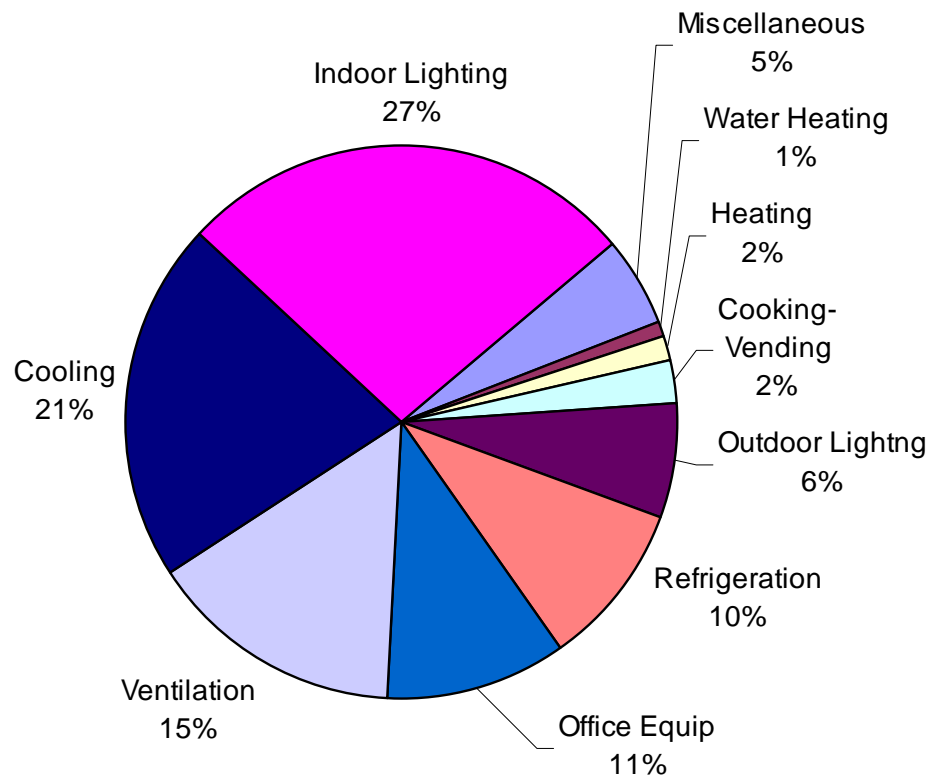
Commercial Baseline – Energy



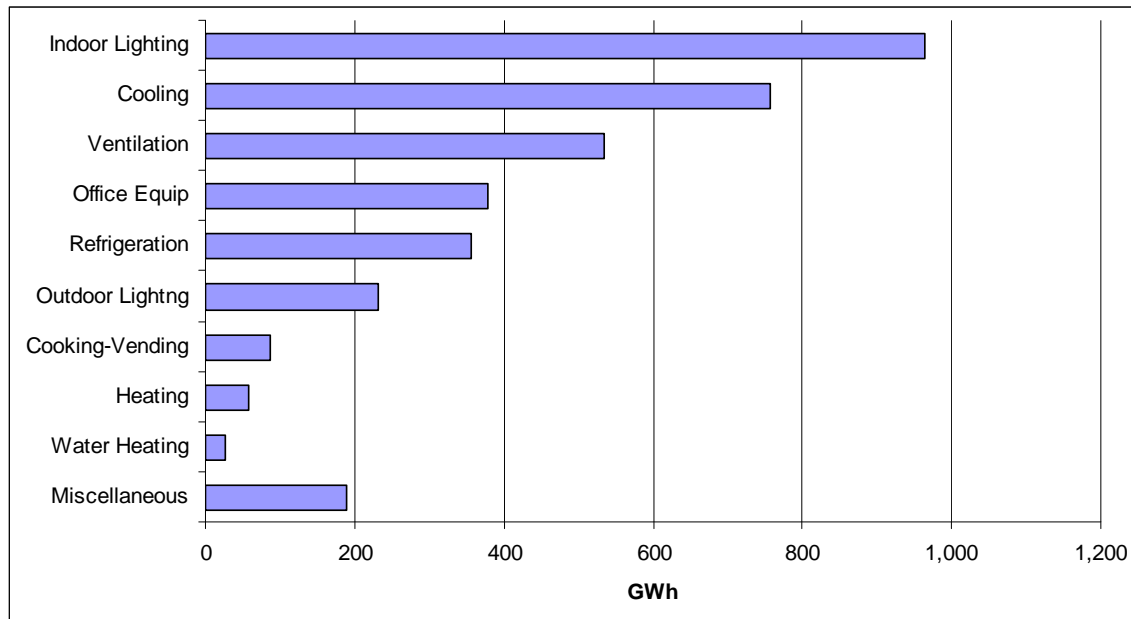
Energy Use by Building Type



Commerical Energy Use by End Use



Commerical Energy Use by End Use



Selected Industrial Results

Age of Facility

Year	Assembly	Process	Total
Before 1950	27%	1%	19%
1950 to 1979	34%	21%	30%
1980 to 1989	13%	44%	23%
1990 to 1999	3%	3%	3%
2000 to 2004	12%	7%	10%
2005 to 2009	11%	23%	15%
Total	100%	100%	100%

General Building Info

Industrial Building Overview

Industrial Building Type	N	% of Buildings in Rhode Island
Assembly	34	67%
Process	11	33%
Total	45	100%

Age of Industrial Facilities

Year	Assembly	Process	Total
Before 1950	27%	1%	19%
1950 to 1979	34%	21%	30%
1980 to 1989	13%	44%	23%
1990 to 1999	3%	3%	3%
2000 to 2004	12%	7%	10%
2005 to 2009	11%	23%	15%
Total	100%	100%	100%

End Use Overview

End Use	Assembly	Process	Total
Process Boilers	11%	11%	11%
Compressed Air	86%	56%	76%
Space Cooling	63%	33%	53%
Process Fans and Blowers	24%	80%	58%
Process Motors	59%	35%	51%
Process Heating	54%	24%	56%
Pumps	52%	77%	60%
Refrigeration	23%	22%	23%
Space Heating	90%	58%	79%
Other Processes	20%	2%	14%

Lighting Overview

Industrial Building Type	% w/ Fluorescent	% w/ Incandescent	% w/ HID
Assembly	100%	30%	26%
Process	100%	99%	37%

Equipment Used for Space Cooling

Equipment	Assembly	Process	Total
Water Cooled Chiller	1%	0%	1%
Air Cooled Chiller	1%	4%	1%
Packaged heat pumps for cooling	1%	0%	0%
Rooftop or packaged AC units (DX units)	35%	65%	39%
DX Split Systems	31%	27%	30%
Absorption Gas or Steam	1%	0%	0%
PTAC System (Individual Room Heater)	0%	4%	1%
Individual room air conditioners, other than heat pumps	32%	0%	27%
Total	100%	100%	100%

% of Cooling Load Supplied

Equipment	Assembly	Process	Total
Water Cooled Chiller	1%	0%	1%
Air Cooled Chiller	0%	4%	1%
Packaged heat pumps for cooling	0%	0%	0%
Rooftop or packaged AC units (DX units)	31%	67%	39%
DX Split Systems	28%	25%	28%
Absorption Gas or Steam	1%	0%	1%
PTAC System (Individual Room Heater)	0%	4%	1%
Individual room air conditioners, other than heat pumps	38%	0%	30%
Total	100%	100%	100%

NEMA Premium Motor Overview

Fan Motor Systems

Industrial Building Type	1 to 5 hp	6 to 100 hp	Over 100 hp
Assembly	22%	35%	100%
Process	6%	14%	85%
Total	12%	25%	87%

Pump Motor Systems

Industrial Building Type	1 to 5 hp	6 to 100 hp	Over 100 hp
Assembly	8%	31%	100%
Process	23%	28%	100%
Total	16%	30%	100%

Process Motor Systems

Industrial Building Type	1 to 5 hp	6 to 100 hp	Over 100 hp
Assembly	26%	21%	46%
Process	30%	30%	0%
Total	27%	23%	42%

Type of Fuel

Process Boiler Systems

Fuel	Assembly	Process	Total
#2 Fuel Oil	4%	64%	18%
Natural Gas	84%	36%	73%
Other	12%	0%	9%

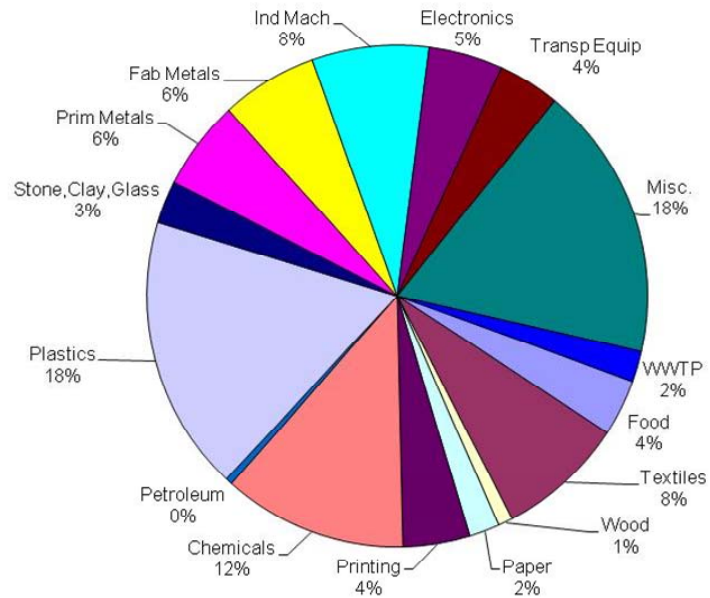
Process Heating Systems

Fuel	Assembly	Process	Total
Electricity	56%	44%	53%
Natural Gas	40%	56%	44%
Oil	2%	0%	1%
Bottled Gas or Propane	2%	0%	2%

Space Heating

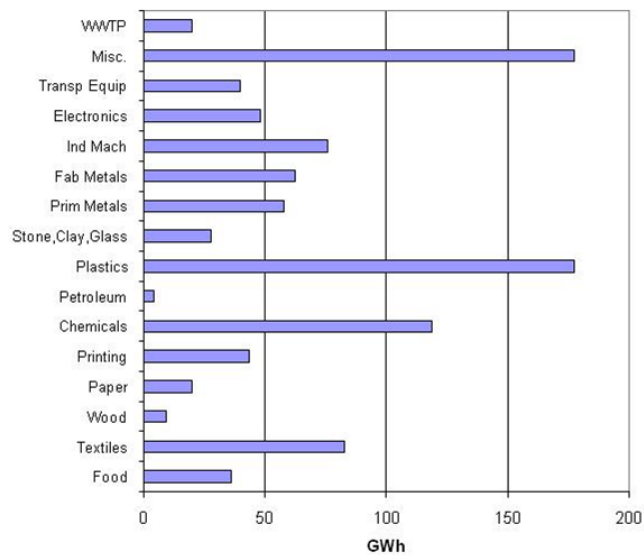
Fuel	Assembly	Process	Total
Electricity	45%	1%	33%
Natural Gas	32%	23%	30%
Coal	12%	19%	14%
Kerosene	0%	18%	5%
Bottled Gas or Propane	7%	37%	14%
Other	5%	1%	4%

Industrial Baseline- Use by industry type

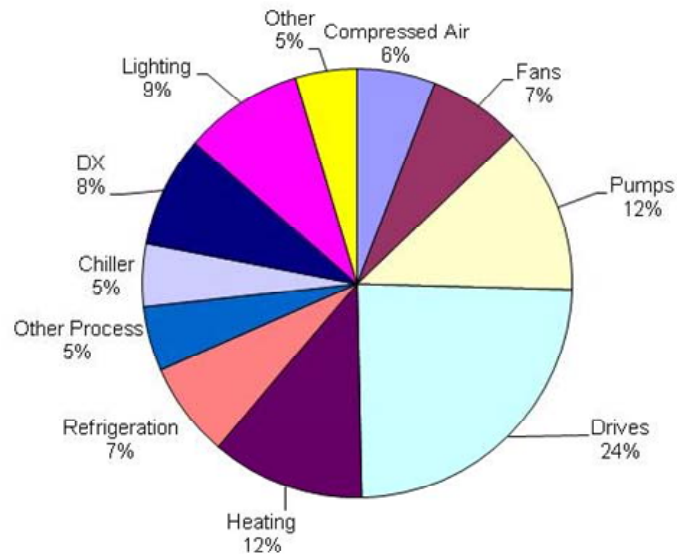


Industrial Baseline-

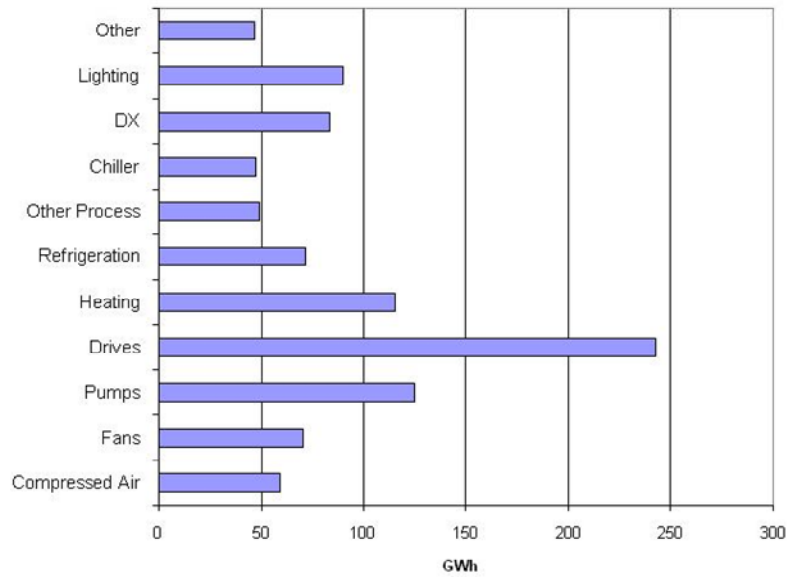
Use by industry type



Industrial Baseline- Usage by End Use



Industrial Baseline- Usage by End Use



Draft of Rhode Island EERMC Residential Survey

Surveyor Name:
Survey Date:
Homeowner Name:
Homeowner Address:
Homeowner Phone:

INTRODUCTION

Hello. This is _____ calling from Research America on behalf of National Grid. We're conducting research on home energy usage in order to help plan for the future energy needs of Rhode Island residents. This is important research and we would appreciate your participation. I want to assure you that this is not a sales call and the information you provide will be kept strictly confidential.

May I please speak to one of the heads of your household?

[REPEAT INTRO AS NEEDED, CONTINUE OR ARRANGE FOR CALLBACK]

[IF REQUESTED]

For further questions about this survey, you can contact David Jacobson, Manager of Efficiency Evaluation, at National Grid. The phone number is 781-907-1550.

Screening Questions

SC1: I'd like to confirm if your home address is:

[NAME OF ADDRESS FROM CATI LIST]

1. <input type="checkbox"/> Confirmed address	
2. <input type="checkbox"/> Address not confirmed	Thank & Terminate Survey
97. <input type="checkbox"/> Don't know	Thank & Terminate Survey
98. <input type="checkbox"/> Refused to answer	Thank & Terminate Survey

SC2: Is this a residence or a business?

1. <input type="checkbox"/> Residence	
2. <input type="checkbox"/> Both residence and business	
3. <input type="checkbox"/> Business only	Thank & Terminate Survey
97. <input type="checkbox"/> Don't know	Thank & Terminate Survey
98. <input type="checkbox"/> Refused to answer	Thank & Terminate Survey

Housing Characteristics

I'd like to ask some questions about the type of house or building you live in.

HC1. Which of the following best describes your home? Is it a

[READ LIST. RECORD ONLY ONE RESPONSE]

1. <input type="checkbox"/> Single family detached home
2. <input type="checkbox"/> Townhouse, duplex or row house (shares exterior walls with adjacent unit, but not roof or floor)
3. <input type="checkbox"/> Apartment or condominium (2 to 4 units)
4. <input type="checkbox"/> Apartment or condominium (5 or more units)
5. <input type="checkbox"/> Mobile home
6. <input type="checkbox"/> Other (Please describe: _____)
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

HC2. Is your home occupied year round, or is it a seasonal home?

1. <input type="checkbox"/> Year round residence
2. <input type="checkbox"/> Seasonal / vacation home
3. <input type="checkbox"/> Other (Please describe: _____)
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

HC3. Do you own or rent your home?

1. <input type="checkbox"/> Own
2. <input type="checkbox"/> Rent
3. <input type="checkbox"/> Other (Please describe: _____)
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

HC4. Approximately what year was this home or building constructed?

1. <input type="checkbox"/> Before 1930
2. <input type="checkbox"/> 1930 to 1939
3. <input type="checkbox"/> 1940 to 1949
4. <input type="checkbox"/> 1950 to 1959
5. <input type="checkbox"/> 1960 to 1969
6. <input type="checkbox"/> 1970 to 1979
7. <input type="checkbox"/> 1980 to 1989
8. <input type="checkbox"/> 1990 to 1994
9. <input type="checkbox"/> 1995 to 1999
10. <input type="checkbox"/> 2000 to 2003
11. <input type="checkbox"/> 2004-2009
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

HC5. What is the approximate square footage of the living space of your home?

Do not include unheated garage, attic, or basement space.

[Prompt by reading response options if necessary]

1. <input type="checkbox"/> Less than 800 square feet
2. <input type="checkbox"/> 800 to 1,199 square feet
3. <input type="checkbox"/> 1,200 – 1,599 square feet
4. <input type="checkbox"/> 1,600 – 1,999 square feet
5. <input type="checkbox"/> 2,000 – 2,499 square feet
6. <input type="checkbox"/> 2,500 – 3,000 square feet
7. <input type="checkbox"/> Over 3,000 square feet
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

HC6: Who is responsible for paying the electric bill for your home or apartment?

1. <input type="checkbox"/> Head of household pays electric bill	
2. <input type="checkbox"/> Head of household and property owner/landlord each pays for portion of electric bill	
3. <input type="checkbox"/> Property owner/landlord pays electric bill	Skip to HC8
97. <input type="checkbox"/> Don't know	Skip to HC8
98. <input type="checkbox"/> Refused to answer	Skip to HC8

HC7. How much is your average monthly electricity bill?

[\[READ LIST. RECORD ONLY ONE RESPONSE\]](#)

1. <input type="checkbox"/> Less than \$25
2. <input type="checkbox"/> \$26 to \$50
3. <input type="checkbox"/> \$51 to \$100
4. <input type="checkbox"/> \$101 to \$200
5. <input type="checkbox"/> More than \$200
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

HC8: Who is responsible for paying the gas bill for your home or apartment?

1. <input type="checkbox"/> Head of household pays gas bill	
2. <input type="checkbox"/> Head of household and property owner/landlord each pays for portion of gas bill	
3. <input type="checkbox"/> Property owner/landlord pays gas bill	Skip to HC10
4. <input type="checkbox"/> Do not use gas (Not applicable)	Skip to HC10
97. <input type="checkbox"/> Don't know	Skip to HC10
98. <input type="checkbox"/> Refused to answer	Skip to HC10

HC9. How much is your average monthly gas bill?

[\[READ LIST. RECORD ONLY ONE RESPONSE\]](#)

1. <input type="checkbox"/> Less than \$25
2. <input type="checkbox"/> \$26 to \$50
3. <input type="checkbox"/> \$51 to \$100
4. <input type="checkbox"/> \$101 to \$200
5. <input type="checkbox"/> More than \$200
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

HC10. How many years have you lived at your current address?

[Prompt by reading response options if necessary]

1. <input type="checkbox"/> Less than one year
2. <input type="checkbox"/> 1 year to 5 years
3. <input type="checkbox"/> More than 5 years to 10 years
4. <input type="checkbox"/> More than 10 years to 20
5. <input type="checkbox"/> More than 20 years
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

HC11. [IF HC3=1 AND HC4 = 11; Else skip to PA1] Is your home an Energy Star labeled or Energy Star certified home?

1. <input type="checkbox"/> Yes
2. <input type="checkbox"/> No
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

Program Awareness

PA1. Are you aware that your utility, National Grid, has energy efficiency programs or products that offer incentives or rebates?

1. <input type="checkbox"/> Yes	
2. <input type="checkbox"/> No	SKIP TO ES1
97. <input type="checkbox"/> Don't know	
98. <input type="checkbox"/> Refused to answer	

PA2. While living in your current home, have you participated in any National Grid energy efficiency programs or purchased any of the promoted products?

1. <input type="checkbox"/> Yes	
2. <input type="checkbox"/> No	SKIP TO ES1
97. <input type="checkbox"/> Don't know	SKIP TO ES1
98. <input type="checkbox"/> Refused to answer	SKIP TO ES1

PA3. Would you participate in the program again or purchase the promoted products again should you have the opportunity?

1. <input type="checkbox"/> Yes	SKIP TO ES1
2. <input type="checkbox"/> No	
97. <input type="checkbox"/> Don't know	
98. <input type="checkbox"/> Refused to answer	SKIP TO ES1

PA4. Why do you say that?

[READ LIST. RECORD MULTIPLE RESPONSES]

1. <input type="checkbox"/> Incentives were not enough
2. <input type="checkbox"/> Too much of a hassle
3. <input type="checkbox"/> Other (please describe: _____)
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

Energy Star Awareness

ES1. Have you ever heard of or seen the Energy Star® label?

1. <input type="checkbox"/> Yes	
2. <input type="checkbox"/> No	SKIP TO WBE1
97. <input type="checkbox"/> Don't know	SKIP TO WBE1
98. <input type="checkbox"/> Refused to answer	SKIP TO WBE1

ES2. Do any of the following appliances you own have the Energy Star® label?

Energy Star Appliance	1. Yes	1a. [If Yes] How many?	2. No	97. Don't know	98. Refused to answer
1. Central Air Conditioner	<input type="checkbox"/>	SKIP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Room Air Conditioner	<input type="checkbox"/>	[IF ES2_2=Y] ____#	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Dehumidifier	<input type="checkbox"/>	[IF ES2_3=Y] ____#	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Primary Heating System	<input type="checkbox"/>	SKIP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Secondary Heating System (e.g., electric or kerosene heater; wood or coal stove)	<input type="checkbox"/>	[IF ES2_5=Y] ____#	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Water Heater	<input type="checkbox"/>	[IF ES2_6=Y] ____#	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Primary Refrigerator	<input type="checkbox"/>	SKIP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Secondary Refrigerator(s)	<input type="checkbox"/>	SKIP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Stand-Alone Freezer	<input type="checkbox"/>	[IF ES2_9=Y] ____#	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Dishwasher	<input type="checkbox"/>	SKIP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Clothes Washer	<input type="checkbox"/>	SKIP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Desktop Computer	<input type="checkbox"/>	[IF ES2_12=Y] ____#	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Laptop Computer	<input type="checkbox"/>	[IF ES2_13=Y] ____#	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Television	<input type="checkbox"/>	[IF ES2_14=Y] ____#	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Windows	<input type="checkbox"/>	[IF ES2_15=Y] ____# [Note that estimate is fine]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. Other (Please describe:____)	<input type="checkbox"/>	[IF ES2_16=Y] ____#	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Weatherization/Building Envelope

Next I'd like to ask you a few questions about the exterior of your home, such as the exterior walls, windows, and roof.

WBE1. Are your home's exterior walls insulated?

[IF YES: PROBE IF RESPONSE OPTION 1 OR 2]

1. <input type="checkbox"/> Yes, all walls
2. <input type="checkbox"/> Yes, some walls
3. <input type="checkbox"/> No
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

WBE2. Are your floors in your home insulated?

1. <input type="checkbox"/> Yes
2. <input type="checkbox"/> No
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

WBE3. Is your home's attic/ceiling insulated?

1. <input type="checkbox"/> Yes	
2. <input type="checkbox"/> No	SKIP TO WBE5
97. <input type="checkbox"/> Don't know	SKIP TO WBE5
98. <input type="checkbox"/> Refused to answer	SKIP TO WBE5

WBE4. Please provide an estimate of the number of inches of insulation in your attic/ceiling?

[READ LIST. RECORD ONLY ONE RESPONSE]

1. <input type="checkbox"/> 0 to 3 inches
2. <input type="checkbox"/> 4 to 6 inches
3. <input type="checkbox"/> 7 to 10 inches
4. <input type="checkbox"/> More than 10 inches
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

WBE5. Choose the statement that best describes your windows.

[READ LIST. RECORD ONLY ONE RESPONSE]

1. <input type="checkbox"/> All or most are single pane windows with storm windows	SKIP TO WBE6
2. <input type="checkbox"/> All or most are single pane windows without storm windows	SKIP TO WBE6
3. <input type="checkbox"/> All or most are double pane windows with storm windows	
4. <input type="checkbox"/> All or most are double pane windows without storm windows	
5. <input type="checkbox"/> Home is a mixture of single pane and double pane windows	
6. <input type="checkbox"/> Have other types of windows (Please describe: _____)	SKIP TO WBE6
97. <input type="checkbox"/> Don't know	SKIP TO WBE6
98. <input type="checkbox"/> Refused to answer	SKIP TO WBE6

WBE5a. Are all or most of your double pane windows gas filled (e.g., argon)?

1. <input type="checkbox"/> Yes
2. <input type="checkbox"/> No
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

WBE6. Within the last 5 years, have you had leaky ducts sealed?

1. <input type="checkbox"/> Yes	
2. <input type="checkbox"/> No	SKIP TO Cool1
97. <input type="checkbox"/> Don't know	SKIP TO Cool1
98. <input type="checkbox"/> Refused to answer	SKIP TO Cool1

WBE7. Have you sealed your home's ducts in order to address any of the following issues?:

Issue	1. Yes	2. No	97. Don't know	98. Refused to answer
1. High summer and winter utility bills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Rooms that are difficult to heat or cool	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Rooms that often feel stuffy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Other (Please describe:_____)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Cooling

Now I am going to ask about air conditioning used in your home.

Cool1. Do you have a central air conditioning system in your home?

Do not include room air conditioners or fans.

1. <input type="checkbox"/> Yes	
2. <input type="checkbox"/> No	SKIP TO Cool8
97. <input type="checkbox"/> Don't know	SKIP TO Cool8
98. <input type="checkbox"/> Refused to answer	SKIP TO Cool8

Cool2. How old is your central air conditioning system?

[Prompt by reading response options if necessary]

1. <input type="checkbox"/> Less than one year old
2. <input type="checkbox"/> 1 year to 4 years old
3. <input type="checkbox"/> More than 4 years to 10 years old
4. <input type="checkbox"/> More than 10 years to 15 years old
5. <input type="checkbox"/> More than 15 years to 20 years old
6. <input type="checkbox"/> More than 20 years old
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

Cool3. Does the central air conditioning system serve your home or more than one home or apartment?

1. <input type="checkbox"/> Serves home or apartment only
2. <input type="checkbox"/> Serves more than one home or apartment
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

Cool4. When was the last time you had maintenance done on the central air conditioning system in your home?

[Prompt by reading response options if necessary]

1. <input type="checkbox"/> Within the past year
2. <input type="checkbox"/> 1 to 2 years ago
3. <input type="checkbox"/> More than 2 years to 3 years
4. <input type="checkbox"/> More than 3 years ago
5. <input type="checkbox"/> Never
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

Cool5. Do you use a programmable thermostat for your central air conditioner?

1. <input type="checkbox"/> Yes
2. <input type="checkbox"/> No
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

Cool6. About how many days of the year do you run your central air conditioner during cooling season?
[\[Prompt by reading response options if necessary\]](#)

1. <input type="checkbox"/> Less than 30 days
2. <input type="checkbox"/> Between 30 to 60 days
3. <input type="checkbox"/> Between 61 to 90 days
4. <input type="checkbox"/> More than 90 days
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

Cool7. About how many hours do you run your central air conditioner each day it is used?
[\[Prompt by reading response options if necessary\]](#)

1. <input type="checkbox"/> Less than 4 hours
2. <input type="checkbox"/> 4 hours to 8 hours
3. <input type="checkbox"/> More than 8 hours to 12 hours
4. <input type="checkbox"/> More than 12 hours to 16 hours
5. <input type="checkbox"/> More than 16 hours to 20 hours
6. <input type="checkbox"/> More than 20 hours
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

Cool8. How many room air conditioners do you use in your home?

1. <input type="checkbox"/> None	SKIP TO D1
2. <input type="checkbox"/> One	
3. <input type="checkbox"/> Two	
4. <input type="checkbox"/> Three or more	
97. <input type="checkbox"/> Don't know	SKIP TO D1
98. <input type="checkbox"/> Refused to answer	SKIP TO D1

Cool9. How old are the room air conditioners you run?

[\[Prompt by reading response options if necessary\]](#)

	1. Less than one year old	2. 1 year to 4 years old	3. More than 4 years to 10 years old	4. More than 10 years to 15 years old	5. More than 20 years old	97. Don't know	98. Refused to answer
1. Unit #1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Unit #2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Unit #3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Cool10. About how many days of the year do you run your room air conditioner(s) during cooling season?

[\[Prompt by reading response options if necessary\]](#)

	1. Less than 30 days	2. Between 30 to 60 days	3. Between 61 to 90 days	4. More than 90 days	97. Don't know	98. Refused to answer
1. Unit #1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Unit #2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Unit #3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Cool11. About how many hours do you run your room air conditioner(s) each day it is used?

[\[Prompt by reading response options if necessary\]](#)

	1. Less than 4 hours	2. More than 4 hours to 8 hours	3. More than 8 hours to 12 hours	4. More than 12 years to 16 years	5. More than 16 years to 20 hours	6. More than 20 hours	97. Don't know	Re a
1. Unit #1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2. Unit #2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3. Unit #3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Dehumidifiers

D1. How many dehumidifiers do you use?

1. <input type="checkbox"/> None	SKIP TO SH1
2. <input type="checkbox"/> One	
3. <input type="checkbox"/> Two	
4. <input type="checkbox"/> Three or more	
97. <input type="checkbox"/> Don't know	SKIP TO SH1
98. <input type="checkbox"/> Refused to answer	SKIP TO SH1

D2. About how many days of the year do you run your dehumidifier(s)?

[\[Prompt by reading response options if necessary\]](#)

	1. Less than 30 days	2. Between 30 to 60 days	3. Between 61 to 90 days	4. More than 90 days	5. Keep dehumidifier running continuously	97. Don't know	98. Refused to answer
Unit #1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Unit #2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Unit #3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Space Heating

Now I am going to ask about space heating systems used in your home.

SH1. What is the main type of fuel used to heat your home?

[IF NEEDED: READ LIST. RECORD ONLY ONE RESPONSE]

1. <input type="checkbox"/> Natural gas	
2. <input type="checkbox"/> Bottled gas or propane	SKIP TO SH3
3. <input type="checkbox"/> Electric	SKIP TO SH4
4. <input type="checkbox"/> Oil	SKIP TO SH5
5. <input type="checkbox"/> Kerosene	SKIP TO SH6
6. <input type="checkbox"/> Wood	SKIP TO SH6
7. <input type="checkbox"/> Solar	SKIP TO SH6
8. <input type="checkbox"/> Geothermal	SKIP TO SH6
9. <input type="checkbox"/> Other (Please describe:_____)	SKIP TO SH6
10. <input type="checkbox"/> No heating system	SKIP TO WH1
97. <input type="checkbox"/> Don't know	SKIP TO SH6
98. <input type="checkbox"/> Refused to answer	SKIP TO SH6

SH2. [If use natural gas] What type of system provides most of the space heating for your home?

[IF NEEDED: READ LIST. RECORD ONLY ONE RESPONSE]

1. <input type="checkbox"/> Central forced air furnace	SKIP TO SH6
2. <input type="checkbox"/> Steam boiler (upright radiators or baseboards)	SKIP TO SH6
3. <input type="checkbox"/> Hot water boiler (upright radiators or baseboards)	SKIP TO SH6
4. <input type="checkbox"/> Direct Vent Space heaters	SKIP TO SH6
5. <input type="checkbox"/> Un-vented Space heaters	SKIP TO SH6
6. <input type="checkbox"/> Fireplace Inserts	SKIP TO SH6
7. <input type="checkbox"/> Stoves	SKIP TO SH6
8. <input type="checkbox"/> Other (Please describe:_____)	SKIP TO SH6
97. <input type="checkbox"/> Don't know	SKIP TO SH6
98. <input type="checkbox"/> Refused to answer	SKIP TO SH6

SH3. [If use bottled gas or propane] What type of system provides most of the space heating for your home?

[IF NEEDED: READ LIST. RECORD ONLY ONE RESPONSE]

1. <input type="checkbox"/> Central forced air furnace	SKIP TO SH6
2. <input type="checkbox"/> Steam boiler (upright radiators or baseboards)	SKIP TO SH6
3. <input type="checkbox"/> Hot water boiler (upright radiators or baseboards)	SKIP TO SH6
4. <input type="checkbox"/> Direct Vent Space heaters	SKIP TO SH6
5. <input type="checkbox"/> Un-vented Space heaters	SKIP TO SH6
6. <input type="checkbox"/> Portable heaters	SKIP TO SH6
7. <input type="checkbox"/> Fireplace Inserts	SKIP TO SH6
8. <input type="checkbox"/> Stoves	SKIP TO SH6
9. <input type="checkbox"/> Other (Please describe:_____)	SKIP TO SH6
97. <input type="checkbox"/> Don't know	SKIP TO SH6
98. <input type="checkbox"/> Refused to answer	SKIP TO SH6

SH4. [If use electric heating] What type of system provides most of the space heating for your home?

[IF NEEDED: READ LIST. RECORD ONLY ONE RESPONSE]

1. <input type="checkbox"/> Baseboard, wall heaters without fans, or ceiling cables	SKIP TO SH6
2. <input type="checkbox"/> Wall heaters with fans	SKIP TO SH6
3. <input type="checkbox"/> Other (Please describe:_____)	SKIP TO SH6
97. <input type="checkbox"/> Don't know	SKIP TO SH6
98. <input type="checkbox"/> Refused to answer	SKIP TO SH6

SH5. [If use oil] What type of system provides most of the space heating for your home?

[IF NEEDED: READ LIST. RECORD ONLY ONE RESPONSE]

1. <input type="checkbox"/> Central forced air furnace
2. <input type="checkbox"/> Steam boiler (upright radiators or baseboards)
3. <input type="checkbox"/> Hot water boiler (upright radiators or baseboards)
4. <input type="checkbox"/> Other (Please describe:_____)
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

SH6. Who is responsible for paying to heat your home?

[IF NEEDED: READ LIST. RECORD ONLY ONE RESPONSE]

1. <input type="checkbox"/> Respondent pays
2. <input type="checkbox"/> Property owner/landlord
3. <input type="checkbox"/> Respondent pays for some heating and owner/landlord pays for some heating
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

SH7. Does the heating system only serve your home or more than one home or apartment?

1. <input type="checkbox"/> Serves home or apartment only
2. <input type="checkbox"/> Serves more than one home or apartment
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

SH8. How old is your primary heating system?

[Prompt by reading response options if necessary]

1. <input type="checkbox"/> Less than one year old	
2. <input type="checkbox"/> 1 year to 4 years old	
3. <input type="checkbox"/> More than 4 years to 10 years old	SKIP TO SH10
4. <input type="checkbox"/> More than 10 years to 15 years old	SKIP TO SH10
5. <input type="checkbox"/> More than 15 years to 20 years old	SKIP TO SH10
6. <input type="checkbox"/> More than 20 years old	SKIP TO SH10
97. <input type="checkbox"/> Don't know	SKIP TO SH10
98. <input type="checkbox"/> Refused to answer	SKIP TO SH10

SH9. Did you specifically request that the new heating system be energy efficient?

1. <input type="checkbox"/> Yes
2. <input type="checkbox"/> No
3. <input type="checkbox"/> Not applicable - someone else installed the equipment
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

SH10. Do you use a programmable thermostat for your main heating system?

1. <input type="checkbox"/> Yes
2. <input type="checkbox"/> No
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

SH11. In the winter, what temperature do you typically set your thermostat to when you are home?

1. <input type="checkbox"/> Off
2. <input type="checkbox"/> Less than 65 degrees
3. <input type="checkbox"/> 65 to 70 degrees
4. <input type="checkbox"/> 71 to 75 degrees
5. <input type="checkbox"/> More than 75 degrees
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

SH12. Do you turn down the temperature at times such as at night or when you are not at home?

1. <input type="checkbox"/> Yes
2. <input type="checkbox"/> No
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

SH13. When was the last time you had maintenance done on your main heating system?

[Prompt by reading response options if necessary]

1. <input type="checkbox"/> Within the past year
2. <input type="checkbox"/> 1 to 2 years ago
3. <input type="checkbox"/> More than 2 years to 3 years ago
4. <input type="checkbox"/> More than 3 years ago
5. <input type="checkbox"/> Never
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

SH14. Is this system we've been talking about the only way you heat your home?

1. <input type="checkbox"/> Yes	SKIP TO WH1
2. <input type="checkbox"/> No	
97. <input type="checkbox"/> Don't know	SKIP TO WH1
98. <input type="checkbox"/> Refused to answer	SKIP TO WH1

SH15. Which of the following do you use for secondary heating?

Secondary Heating System	1. Yes	2. No	97. Don't know	98. Refused to answer
1. Resistance (baseboard/ceiling/floor/wall)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Furnace (central forced air furnace)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Gas or oil boiler	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Heat pump system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Portable electric heaters	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Kerosene heater	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Fixed gas space heater	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Gas fireplace insert	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Wood burning fireplace	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Wood or coal stove	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Other (Please describe: _____)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SH16. Approximately how often do you use your non-primary heating system(s) during the heating season?
[READ LIST. RECORD ONLY ONE RESPONSE]

1. <input type="checkbox"/> Every day
2. <input type="checkbox"/> 3-5 days per week
3. <input type="checkbox"/> 1-2 days per week
4. <input type="checkbox"/> Only a few days a year
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

SH17. What percent of your home is heated by your non-primary heating system(s)?

1. <input type="checkbox"/> 1 to 25%
2. <input type="checkbox"/> 26 to 50%
3. <input type="checkbox"/> 51 to 75%
4. <input type="checkbox"/> 76 to 100%
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

Water Heating

Next I'd like to ask about water heating equipment used in your home.

WH1. How many water heaters are in your home?

1. <input type="checkbox"/> None	SKIP TO WH7
2. <input type="checkbox"/> One	
3. <input type="checkbox"/> Two	
4. <input type="checkbox"/> Three or more	
97. <input type="checkbox"/> Don't know	SKIP TO WH7
98. <input type="checkbox"/> Refused to answer	SKIP TO WH7

WH2. What is the main type of fuel you use to heat water in your home?

1. <input type="checkbox"/> Natural gas
2. <input type="checkbox"/> Bottled gas or propane
3. <input type="checkbox"/> Electric
4. <input type="checkbox"/> Oil
5. <input type="checkbox"/> Solar
6. <input type="checkbox"/> Kerosene
7. <input type="checkbox"/> Other (Please describe:_____)
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

WH3. What type of system is your main water heater? Would you say it is a...

[READ LIST. RECORD ONLY ONE RESPONSE]

1. <input type="checkbox"/> Traditional water heater tank
2. <input type="checkbox"/> Whole house tankless system
3. <input type="checkbox"/> Heat pump water heater
4. <input type="checkbox"/> High efficiency gas storage water heater
5. <input type="checkbox"/> Indirect tank attached to a boiler
6. <input type="checkbox"/> Other (Please describe:_____)
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

WH4. Do you have an insulating wrap or blanket around your hot water heater?

1. <input type="checkbox"/> Yes
2. <input type="checkbox"/> No
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

WH5. Do you have pipe wrapping around your hot water pipes?

1. <input type="checkbox"/> Yes
2. <input type="checkbox"/> No
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

WH6. Where is your hot water heater located?

1. <input type="checkbox"/> Basement
2. <input type="checkbox"/> Garage
3. <input type="checkbox"/> Outside of home
4. <input type="checkbox"/> Other (Please describe:_____)
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

WH7. How many shower heads are in your home?

1. <input type="checkbox"/> None	SKIP TO WH9
2. <input type="checkbox"/> One	
3. <input type="checkbox"/> Two	
4. <input type="checkbox"/> Three or more	
97. <input type="checkbox"/> Don't know	SKIP TO WH9
98. <input type="checkbox"/> Refused to answer	SKIP TO WH9

WH8. How many of these are low-flow shower heads?

[Low-flow showerheads use 2.5 gallons or less per minute and have been standard since 1993]

1. <input type="checkbox"/> None
2. <input type="checkbox"/> One
3. <input type="checkbox"/> Two
4. <input type="checkbox"/> Three or more
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

WH9. How many sinks are used in your home?

1. <input type="checkbox"/> None	SKIP TO R1
2. <input type="checkbox"/> One	
3. <input type="checkbox"/> Two	
4. <input type="checkbox"/> Three	
5. <input type="checkbox"/> Four	
6. <input type="checkbox"/> Five or more	
97. <input type="checkbox"/> Don't know	SKIP TO R1
98. <input type="checkbox"/> Refused to answer	SKIP TO R1

WH10. How many of these sinks have a faucet aerator?

[Aerators are add-on devices that reduce the water usage by mixing air into the water stream]

1. <input type="checkbox"/> None
2. <input type="checkbox"/> One
3. <input type="checkbox"/> Two
4. <input type="checkbox"/> Three or more
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

Refrigeration

Now I am going to ask about refrigeration in your home.

R1. How many refrigerators do you use in your home?

1. <input type="checkbox"/> None	SKIP TO F1
2. <input type="checkbox"/> One	
3. <input type="checkbox"/> Two	
4. <input type="checkbox"/> Three or more	
97. <input type="checkbox"/> Don't know	SKIP TO F1
98. <input type="checkbox"/> Refused to answer	SKIP TO F1

R2. About how much of the time is this refrigerator plugged in?

[READ LIST. RECORD ONLY ONE RESPONSE]

	1. Never	2. Sometimes	3. All of the time	97. Don't know	98. Refused to answer
1. Unit #1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Unit #2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Unit #3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

R3. How old is this refrigerator?

[Prompt by reading response options if necessary]

	1. Less than one year old	2. 1 year to 4 years old	3. More than 4 years to 10 years old	4. More than 10 years to 15 years old	5. More than 15 years to 20 years old	6. More than 20 years old	97. Don't know	98. Refused to answer
1. Unit #1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Unit #2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Unit #3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

R4. What style best describes this refrigerator?

[READ LIST. RECORD ONLY ONE RESPONSE]

	1. A single door with the freezer inside	2. Two side by side doors	3. A top freezer	4. A bottom freezer	5. Other (Please describe)	97. Don't know	98. Refused to answer
1. Unit #1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Unit #2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Unit #3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

R5. What size, in cubic feet, best describes this refrigerator?

[READ LIST. RECORD ONLY ONE RESPONSE]

	1. Mini (Less than 10 cubic feet)	2. Small (10 to 14 cubic feet)	3. Medium (15 to 20 cubic feet)	4. Large (More than 20 cubic feet)	97. Don't know	98. Refused to answer
1. Unit #1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Unit #2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Unit #3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

R6. Does this refrigerator have a through the door ice and water dispenser?

	1. Yes	2. No	97. Don't know	98. Refused to answer
1. Unit #1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Unit #2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Unit #3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Freezers

Next I am going to ask about freezers used in your home.

F1. How many stand alone freezers do you use in your home?

1. <input type="checkbox"/> None	SKIP TO FP1
2. <input type="checkbox"/> One	
3. <input type="checkbox"/> Two	
4. <input type="checkbox"/> Three or more	
97. <input type="checkbox"/> Don't know	SKIP TO FP1
98. <input type="checkbox"/> Refused to answer	SKIP TO FP1

F2. About how much of the time is this freezer plugged in?

	1. Never	2. Sometimes	3. All of the time	97. Don't know	98. Refused to answer
1. Unit #1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Unit #2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Unit #3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

F3. How old is this freezer?

[Prompt by reading response options if necessary]

	1. Less than one year old	2. 1 year to 4 years old	3. More than 4 years to 10 years old	4. More than 10 years to 15 years old	5. More than 15 years to 20 years old	6. More than 20 years old	97. Don't know	98. Refused to answer
1. Unit #1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Unit #2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Unit #3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

F4. What style best describes this freezer?

[READ LIST. RECORD ONLY ONE RESPONSE]

	1. Upright, frost-free	2. Upright, manual defrost	3. Chest, frost-free	4. Chest, manual defrost	5. Other (Please describe)	97. Don't know	98. Refused to answer
1. Unit #1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Unit #2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Unit #3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

F5. What size, in cubic feet, best describes this freezer?

[READ LIST. RECORD ONLY ONE RESPONSE]

	1. Small (Less than 15 cubic feet)	2. Medium (15-20 cubic feet)	3. Large (More than 20 cubic feet)	97. Don't know	98. Refused to answer
1. Unit #1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Unit #2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Unit #3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Food Preparation

I am now going to ask about dishwashers and cooking equipment used in your home.

FP1. Do you use a dishwasher in your home?

1. <input type="checkbox"/> Yes	
2. <input type="checkbox"/> No	SKIP TO FP4
97. <input type="checkbox"/> Don't know	SKIP TO FP4
98. <input type="checkbox"/> Refused to answer	SKIP TO FP4

FP2. How old is your dishwasher?

[Prompt by reading response options if necessary]

1. <input type="checkbox"/> Less than one year old
2. <input type="checkbox"/> 1 year to 4 years old
3. <input type="checkbox"/> More than 4 years to 10 years old
4. <input type="checkbox"/> More than 10 years to 15 years old
5. <input type="checkbox"/> More than 15 years to 20 years old
6. <input type="checkbox"/> More than 20 years old
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

FP3. How many loads of dishes do you typically wash in a week?

1. <input type="checkbox"/> Less than one
2. <input type="checkbox"/> One
3. <input type="checkbox"/> Two
4. <input type="checkbox"/> Three
5. <input type="checkbox"/> Four
6. <input type="checkbox"/> Five or more
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

FP4. What type of fuel does your oven use?

1. <input type="checkbox"/> Electric	
2. <input type="checkbox"/> Natural gas	
3. <input type="checkbox"/> Bottled gas or propane	
4. <input type="checkbox"/> Wood	
5. <input type="checkbox"/> Other (Please describe:_____)	
6. <input type="checkbox"/> Do not have an oven	SKIP TO FP6
97. <input type="checkbox"/> Don't know	SKIP TO FP6
98. <input type="checkbox"/> Refused to answer	SKIP TO FP6

FP5. What type of fuel does your cook-top or burners use?

1. <input type="checkbox"/> Electric
2. <input type="checkbox"/> Natural gas
3. <input type="checkbox"/> Bottled gas or propane
4. <input type="checkbox"/> Wood
5. <input type="checkbox"/> Other (Please describe:_____)
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

FP6. Do you use a microwave oven?

1. <input type="checkbox"/> Yes
2. <input type="checkbox"/> No
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

Laundry

Next I am going to ask about laundry equipment used in your home.

Laundry1. Do you own and use a clothes washer?

1. <input type="checkbox"/> Yes, it is for the private use of this home	
2. <input type="checkbox"/> Yes, but it is in a common area for use by more than one home or apartment	SKIP TO Laundry5
3. <input type="checkbox"/> Do not own and use clothes washer	SKIP TO Laundry5
97. <input type="checkbox"/> Don't know	SKIP TO Laundry5
98. <input type="checkbox"/> Refused to answer	SKIP TO Laundry5

Laundry2. About how many loads of laundry do you typically wash per week?

1. <input type="checkbox"/> Less than one
2. <input type="checkbox"/> One
3. <input type="checkbox"/> Two
4. <input type="checkbox"/> Three
5. <input type="checkbox"/> Four
6. <input type="checkbox"/> Five
7. <input type="checkbox"/> Six
8. <input type="checkbox"/> Seven
9. <input type="checkbox"/> Eight
10. <input type="checkbox"/> Nine
11. <input type="checkbox"/> Ten
12. <input type="checkbox"/> More than ten
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

Laundry3. How old is your clothes washer?

[Prompt by reading response options if necessary]

1. <input type="checkbox"/> Less than one year old
2. <input type="checkbox"/> 1 year to 4 years old
3. <input type="checkbox"/> More than 4 years to 10 years old
4. <input type="checkbox"/> More than 10 years to 15 years old
5. <input type="checkbox"/> More than 15 years to 20 years old
6. <input type="checkbox"/> More than 20 years old
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

Laundry4. Is your clothes washer a top loading machine or a front loading machine?

1. <input type="checkbox"/> Top loading machine
2. <input type="checkbox"/> Front loading machine
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

Laundry5. Do you own and use a clothes dryer?

[IF YES: PROBE IF RESPONSE OPTION 1 OR 2]

1. <input type="checkbox"/> Yes, it is for the private use of this home	
2. <input type="checkbox"/> Yes, but it is in a common area for use by more than one home or apartment	SKIP TO Light1
3. <input type="checkbox"/> Do not own and use clothes washer	SKIP TO Light1
97. <input type="checkbox"/> Don't know	SKIP TO Light1
98. <input type="checkbox"/> Refused to answer	SKIP TO Light1

Laundry6. What type of fuel does your clothes dryer use?

1. <input type="checkbox"/> Electric
2. <input type="checkbox"/> Natural gas
3. <input type="checkbox"/> Bottled gas or propane
4. <input type="checkbox"/> Other (Please describe: _____)
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

Laundry7. How old is your clothes dryer?

[Prompt by reading response options if necessary]

1. <input type="checkbox"/> Less than one year old
2. <input type="checkbox"/> 1 year to 4 years old
3. <input type="checkbox"/> More than 4 years to 10 years old
4. <input type="checkbox"/> More than 10 years to 15 years old
5. <input type="checkbox"/> More than 15 years to 20 years old
6. <input type="checkbox"/> More than 20 years old
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

Laundry8. Does your dryer have a moisture sensor?

[A moisture sensor will automatically turn off the dryer when it senses your clothes are dry]

1. <input type="checkbox"/> Yes
2. <input type="checkbox"/> No
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

Laundry 9. How many loads of wash do you dry each week with your clothes dryer?

1. <input type="checkbox"/> Less than one
2. <input type="checkbox"/> One
3. <input type="checkbox"/> Two
4. <input type="checkbox"/> Three
5. <input type="checkbox"/> Four
6. <input type="checkbox"/> Five
7. <input type="checkbox"/> Six
8. <input type="checkbox"/> Seven
9. <input type="checkbox"/> Eight
10. <input type="checkbox"/> Nine
11. <input type="checkbox"/> Ten
12. <input type="checkbox"/> More than ten
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

Lighting

Now I am going to ask about your home's lighting.

Light1. Have you ever heard of a compact fluorescent light bulb, sometimes referred to as a C-F-L bulb?
[If Necessary: Compact fluorescent light bulbs are similar in size to standard incandescent bulbs but are often made out of thin tubes of glass that are either straight, spiraled or bent into loops]

1. <input type="checkbox"/> Yes	
2. <input type="checkbox"/> No	SKIP TO Light4
97. <input type="checkbox"/> Don't know	SKIP TO Light4
98. <input type="checkbox"/> Refused to answer	SKIP TO Light4

Light2. Have you ever purchased a compact fluorescent light bulb?

1. <input type="checkbox"/> Yes	
2. <input type="checkbox"/> No	SKIP TO Light4
97. <input type="checkbox"/> Don't know	SKIP TO Light4
98. <input type="checkbox"/> Refused to answer	SKIP TO Light4

Light2a. When you purchased the compact fluorescent light bulb(s), did you receive a rebate for any of those purchases?

1. <input type="checkbox"/> Yes	
2. <input type="checkbox"/> No	SKIP TO Light4
97. <input type="checkbox"/> Don't know	SKIP TO Light4
98. <input type="checkbox"/> Refused to answer	SKIP TO Light4

Light3. Would you still have purchased the compact fluorescent light bulbs if no rebate had been offered?

1. <input type="checkbox"/> Yes
2. <input type="checkbox"/> No
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

Light4. How many of the following lighting products do you have in your house?

	1. None	2. 1 – 5	3. 6 – 10	4. 11 – 15	5. More than 15	97. Don't know	98. Refuse to answer
[SKIP IF LIGHT1=2, 97, or 98]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Compact fluorescent light bulbs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Standard incandescent light bulbs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fluorescent tube lights	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Halogen floor lamps	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fluorescent floor lamps	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Indoor lighting controls (e.g., sensors, timers)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Outdoor security/flood lights	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Outdoor lighting controls (e.g., sensors, timers)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
LED lights	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (Please describe: _____)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Light5. [SKIP IF LIGHT1=2, 97, or 98 OR IF LIGHT2=2, 97, or 98]

Approximately what percentage of standard incandescent lights have you replaced with compact fluorescent lights?

1. <input type="checkbox"/> None
2. <input type="checkbox"/> 1 – 25%
3. <input type="checkbox"/> 26 – 50%
4. <input type="checkbox"/> 51 – 75%
5. <input type="checkbox"/> 76 – 100%
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

Light6. [SKIP IF LIGHT1=2, 97, or 98]

How many light sockets do you have that can not be modified to fit compact fluorescent lights?

1. <input type="checkbox"/> None
2. <input type="checkbox"/> One
3. <input type="checkbox"/> Two
4. <input type="checkbox"/> Three or more
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

Pool

If you have a pool at your home, the next set of questions will focus on its features.

Pool1. Do you have a pool?

[IF YES: PROBE IF RESPONSE OPTION 1 OR 2]

1. <input type="checkbox"/> Yes, for private use by this home only	
2. <input type="checkbox"/> Yes, but in a common area for use by more than one home or apartment	SKIP TO App1
3. <input type="checkbox"/> No	SKIP TO App1
97. <input type="checkbox"/> Don't know	SKIP TO App1
98. <input type="checkbox"/> Refused to answer	SKIP TO App1

Pool2. Where is the pool located?

1. <input type="checkbox"/> Outside of the home
2. <input type="checkbox"/> Inside of the home
3. <input type="checkbox"/> Both inside and outside of the home
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

Pool3. Is the pool above ground or in ground?

1. <input type="checkbox"/> Above ground
2. <input type="checkbox"/> In ground
3. <input type="checkbox"/> Both above and in ground
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

Pool4. Do you use a pump to clean your pool?

1. <input type="checkbox"/> Yes	
2. <input type="checkbox"/> No	SKIP TO Pool7
97. <input type="checkbox"/> Don't know	SKIP TO Pool7
98. <input type="checkbox"/> Refused to answer	SKIP TO Pool7

Pool5. Does your pool pump use a variable speed drive?

1. <input type="checkbox"/> Yes
2. <input type="checkbox"/> No
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

Pool6. Do you use a timer with your pool pump?

1. <input type="checkbox"/> Yes
2. <input type="checkbox"/> No
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

Pool7. How often do you run your pump each day the pool is in use?

[Prompt by reading response options if necessary]

1. <input type="checkbox"/> Less than 6 hours
2. <input type="checkbox"/> 6 to 12 hours
3. <input type="checkbox"/> More than 12 hours to 18 hours
4. <input type="checkbox"/> More than 18 hours
5. <input type="checkbox"/> Keep pump running continuously
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

Appliances

App1. How many of the following appliances and equipment are used in your home?

Appliance/Equipment	1. None	2. One	3. Two	4. Three or more	97. Don't know	98. Refuse to answer
1. Multi-function machine (e.g., All-in-1 print/copy/fax)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Printer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Copier	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Plasma screen TV	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. LCD TV	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Other types of TVs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Portable fan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Electric attic fan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Whole-house fan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Humidifier	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Wine or beverage cooler	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Water purification system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Electric blanket	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Aquarium	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Trash compactor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. Sauna (electric)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. Electronic security system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. Pond or water garden pump	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. Electric garage door opener	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. Lawn mower (electric)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21. Electronic household air cleaner	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22. Chargers left plugged in (e.g., phone, camera, batteries)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23. Coffee pot left plugged in	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24. Cable box	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25. DVD and/or VCR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26. Video game console(s)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

App2. How many desk top computers are used in your home?

1. <input type="checkbox"/> None	SKIP TO App4
2. <input type="checkbox"/> One	
3. <input type="checkbox"/> Two	
4. <input type="checkbox"/> Three or more	
97. <input type="checkbox"/> Don't know	SKIP TO App4
98. <input type="checkbox"/> Refused to answer	SKIP TO App4

App3. Which of the following describes what usually happens when done using a desk top computer(s)?
[READ LIST. RECORD ONLY ONE RESPONSE]

	1. Leave computer on so it will be ready for use next time	2. Put computer in sleep mode	3. Power down the computer	4. Turn off the computer monitor	97. Don't know	98. Refused to answer
1. Unit #1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Unit #2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Unit #3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

App4. How many lap top computers are used in your home?

1. <input type="checkbox"/> None	SKIP TO App6
2. <input type="checkbox"/> One	
3. <input type="checkbox"/> Two	
4. <input type="checkbox"/> Three or more	
97. <input type="checkbox"/> Don't know	SKIP TO App6
98. <input type="checkbox"/> Refused to answer	SKIP TO App6

App5. Which of the following describes what usually happens when done using a lap top computer(s)?
[READ LIST. RECORD ONLY ONE RESPONSE]

	1. Leave computer on so it will be ready for use next time	2. Put computer in sleep mode	3. Power down the computer	4. Plug in to charge computer	97. Don't know	98. Refused to answer
1. Unit #1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Unit #2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Unit #3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

App6. Do you have an electric vehicle at your home (e.g., car, wheelchair, golf cart)?

[IF YES: PROBE IF RESPONSE OPTION 1 OR 2]

	1. Yes, charge vehicle at home	2. Yes, but is a hybrid vehicle that does not need to be charged at home	3. No	97. Don't know	98. Refused to answer
1. Vehicle #1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Vehicle #2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Vehicle #3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Demographics

Please provide answers to the following questions. Your responses will be confidential and no data will be used on an individual basis. The information is used to allow us to compare energy usage between various groups.

DEM1. How many people in each of the following age groups live in this home?

	1. None	2. One	3. Two	4. Three	5. Four or more	97. Don't know	98. Refused to answer
1. Less than 12 years old	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. 12 to 17 years old	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. 18 to 25 years of age	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. 26 to 45 years of age	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. 46 to 60 years of age	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. More than 60 years old	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

DEM2. Which of the following ranges best describes your household's total annual income?

Please include all sources of taxable and non-taxable income including wages, pensions, social security, public assistance, etc.

[READ LIST. RECORD ONLY ONE RESPONSE]

1. <input type="checkbox"/> Less than \$15,000
2. <input type="checkbox"/> \$15,000 to \$24,999
3. <input type="checkbox"/> \$25,000 to \$34,999
4. <input type="checkbox"/> \$35,000 to \$49,999
5. <input type="checkbox"/> \$50,000 to \$74,999
6. <input type="checkbox"/> \$75,000 to \$99,999
7. <input type="checkbox"/> \$100,000 to \$150,000
8. <input type="checkbox"/> More than \$150,000
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

DEM3. What was the highest level of education completed by any head of household in your home?

[READ LIST. RECORD ONLY ONE RESPONSE]

1. <input type="checkbox"/> Grade school
2. <input type="checkbox"/> Some high school
3. <input type="checkbox"/> High school graduate (or GED)
4. <input type="checkbox"/> Some college, trade or technical school
5. <input type="checkbox"/> 4 year college graduate
6. <input type="checkbox"/> Graduate studies or advanced degree
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

DEM4. Gender

[Can record from voice of respondent]

1. <input type="checkbox"/> Male
2. <input type="checkbox"/> Female
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

DEM5. Which of the following groups do you consider yourself?
[READ LIST. ALLOW MORE THAN ONE RESPONSE]

1. <input type="checkbox"/> American Indian, Alaska Native
2. <input type="checkbox"/> Asian or Pacific Islander
3. <input type="checkbox"/> Black, African American
4. <input type="checkbox"/> Hispanic, Latino
5. <input type="checkbox"/> White, Caucasian
6. <input type="checkbox"/> Other (Please describe:_____)
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

Rhode Island EERMC Commercial Survey

SITE INFORMATION	
SITE ID:	
SI1. Building Name:	
SI2. Street Address:	
SI3. City, State:	
SI4. Zip Code:	
SI5. Building Phone:	
SI6. Primary Contact Name:	
SI7. Primary Contact Phone:	
SI8. Primary Contact Email:	
SI9. Primary Contact Fax:	
SI10. Secondary Contact Name:	
SI11. Secondary Contact Phone:	
SI12. Secondary Contact Email:	
SI13. Secondary Contact Fax:	

SURVEY TRACKING INFORMATION		
TASK	a. DATE	b. NAME
STI1. Field survey completed:		
STI2. Field survey paperwork completed:		

GENERAL BUILDING INFORMATION

Site Activity:

	a. Activity Code Refer to Site Activity Code	b. If Activity Code = 11, describe:	c. % of Building Space
SA1. Site Activity 1	--		-- % DK R
SA2. Site Activity 2	--		-- % DK R
SA3. Site Activity 3	--		-- % DK R

Site Activity Codes	
01: Office 02: Restaurant 03: Retail Store 04: Food Store 05: Warehouse 06: School	07: College 08: Hospital 09: Other Health Care 10: Hotel/Motel 11: Miscellaneous (Describe)

General Building Characteristics:

GB1. Total floor area of building	_____ ft ² DK R
GB2. Total floor area occupied by business	_____ ft ² DK R
GB3. Total percentage of floor area of business that is cooled	_____ % DK R
GB4. Total percentage floor area of business that is heated	_____ % DK R
GB5. Time since last major remodel/renovation impacting the building's energy consumption?	_____ years DK R
GB6. Building commissioned in past 5 yrs. <i>Commissioning is the process of overseeing equipment startup and testing to make sure systems are operating as designed.</i>	Y N DK R
GB7. ENERGY STAR certification?	Y N DK R
GB8. LEED certification?	Y N DK R

GB9. What year was this building constructed?

[If there have been major additions, give the year the largest portion of the building was completed]

1. <input type="checkbox"/> Before 1950	3. <input type="checkbox"/> 1980 to 1989	5. <input type="checkbox"/> 2000 to 2004	7. <input type="checkbox"/> [If unsure, but can make educated guess]	97. <input type="checkbox"/> Don't know
2. <input type="checkbox"/> 1950 to 1979	4. <input type="checkbox"/> 1990 to 1999	6. <input type="checkbox"/> 2005 to 2009	Provide response: _____	98. <input type="checkbox"/> Refused to answer

GB10. Is this company the owner of the building or does the company lease space?

1. <input type="checkbox"/> Owner	3. <input type="checkbox"/> Own a part and lease the remainder	97. <input type="checkbox"/> Don't know
2. <input type="checkbox"/> Lessee/Tenant	4. <input type="checkbox"/> Other situation (Describe: _____)	98. <input type="checkbox"/> Refused to

GB11. Job title or role of primary contact(s) [Allow for multiple responses]

1. <input type="checkbox"/> Owner / President / CEO	6. <input type="checkbox"/> [If educational setting] Principal/Superintendent/Dean
2. <input type="checkbox"/> Vice President	7. <input type="checkbox"/> Other (Describe: _____)
3. <input type="checkbox"/> Manager or Director of Facilities / Maintenance / Buildings & Grounds	97. <input type="checkbox"/> Don't know
4. <input type="checkbox"/> Energy Manager or Director	98. <input type="checkbox"/> Refused to answer
5. <input type="checkbox"/> CFO / Controller / Treasurer	

GB12. What is your best estimate of your average monthly total energy bills for the following fuels paid by your firm for this location?

Fuel Type	Average Monthly Bill (Summer\$/Winter\$)		Fuel Type	Average Monthly Bill (Summer\$/Winter\$)
GB12_1. Electricity	Enter \$: S:_____ / W:_____ DK R DK R		GB12_6. Kerosene	Enter \$: S:_____ / W:_____ DK R DK R
GB12_2. Natural Gas	Enter \$: S:_____ / W:_____ DK R DK R		GB12_7. Purchased Steam	Enter \$: S:_____ / W:_____ DK R DK R
GB12_3. Coal	Enter \$: S:_____ / W:_____ DK R DK R		GB12_8. Purchased Hot or Chilled Water	Enter \$: S:_____ / W:_____ DK R DK R
GB12_4. Fuel Oil	Enter \$: S:_____ / W:_____ DK R DK R		GB12_9. Other Describe:	Enter \$: S:_____ / W:_____ DK R DK R
GB12_5. Propane/LPG, Bottled Gas	Enter \$: S:_____ / W:_____ DK R DK R			

GB12a. Does the company pay for the electricity their space uses?

1. <input type="checkbox"/> Yes, company pays all	3. <input type="checkbox"/> No, company does not pay	97. <input type="checkbox"/> Don't know
2. <input type="checkbox"/> Yes, company pays a portion		98. <input type="checkbox"/> Refused to answer

GB12b. Does the company pay for the heating their space uses?

1. <input type="checkbox"/> Yes, company pays all	3. <input type="checkbox"/> No, company does not pay	97. <input type="checkbox"/> Don't know
2. <input type="checkbox"/> Yes, company pays a portion		98. <input type="checkbox"/> Refused to answer

GB13. How many hours per week is this space normally open?

[Do not consider the business to be open if only maintenance, housekeeping or security are present.]

[Businesses such as hospitals or hotels are considered to have operating hours of 24/7 (168 hours)]

Enter # of hours/week: _____ **DK R**

GB14. How many employees work in this space during the main shift, that is, when most employees are present?

[Include volunteer workers, but do not include employees who always work outside the building, such as drivers with delivery routes]

1. <input type="checkbox"/> One	5. <input type="checkbox"/> 21 to 50	9. <input type="checkbox"/> 501 to 1,000	97. <input type="checkbox"/> Don't know
2. <input type="checkbox"/> 2 to 5	6. <input type="checkbox"/> 51 to 100	10. <input type="checkbox"/> 1,001 to 3,000	98. <input type="checkbox"/> Refused to answer
3. <input type="checkbox"/> 6 to 10	7. <input type="checkbox"/> 101 to 250	11. <input type="checkbox"/> More than 3,000	
4. <input type="checkbox"/> 11 to 20	8. <input type="checkbox"/> 251 to 500		

WEATHERIZATION / BUILDING ENVELOPE

WBE1. What percentage of the exterior walls are insulated?

Enter % of exterior walls insulated: _____ **DK R**

WBE2. Is the roof and/or ceiling insulated?

1. <input type="checkbox"/> Yes, the roof is insulated (business is on top or only floor)	97. <input type="checkbox"/> Don't know
2. <input type="checkbox"/> Yes, roof not applicable, but ceiling is insulated (business not on top or only floor)	98. <input type="checkbox"/> Refused to answer
3. <input type="checkbox"/> No, no roof and/or ceiling insulation	

WBE3. Is the roof of the building a cool roof?

[Cool Roofs are roofs consisting of materials that reflect the sun's energy from the roof surface. They are usually white in color, but non-white colors are becoming available]

1. <input type="checkbox"/> Yes	2. <input type="checkbox"/> No	97. <input type="checkbox"/> Don't know	98. <input type="checkbox"/> Refused to answer
---------------------------------	--------------------------------	---	--

WBE4. Window Characteristics

Window Type	NOTE: Fill in a1 and a2 OR b			c. % Low Emissive (Low E) Windows	d. % Argon or other gas windows	e. % Other [Please describe]
	a1. Total Number of Windows	a2. Average Size of Windows (sq ft)	b. Total Size of Windows (sq ft)			
1. Single Pane Windows	Enter #: _____ DK R	_____ sq ft DK R	_____ sq ft DK R			
2. Double Pane Windows	Enter #: _____ DK R	_____ sq ft DK R	_____ sq ft DK R	_____% DK R	_____% DK R	_____% DK R _____
3. Triple Pane Windows	Enter #: _____ DK R	_____ sq ft DK R	_____ sq ft DK R	_____% DK R	_____% DK R	_____% DK R _____

WBE5. What percent of the windows have window film/tinting?

1. <input type="checkbox"/> None	2. <input type="checkbox"/> 1 to 25%	4. <input type="checkbox"/> 51 to 75%	97. <input type="checkbox"/> Don't know
	3. <input type="checkbox"/> 26 to 50%	5. <input type="checkbox"/> 76 to 100%	98. <input type="checkbox"/> Refused to answer

WBE6. Within the last 5 years, have leaky HVAC ducts been sealed or repaired to address any of the following issues?:

Duct Sealing Issue Addressed	1. Yes	2. No	97. Don't know	98. Refused to answer
1. High summer and/or winter utility bills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Rooms that are difficult to heat or cool	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Rooms that often feel stuffy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. To reduce cross contamination of air between different parts of your business?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

WBE7. What percentage of HVAC ducts in unconditioned spaces are insulated?

☐ N/A

1. Enter % _ _ _ **DK R**

ENERGY MANAGEMENT SYSTEM (EMS)

[EMS is a computerized building control system that controls equipment operation based on schedules and desired temperature set points]

EMS1. Is there an Energy Management System (EMS) at this facility?

1. <input type="checkbox"/> Yes	Skip to EMS3
2. <input type="checkbox"/> No	
97. <input type="checkbox"/> Don't know	Skip to Cool1
98. <input type="checkbox"/> Refused to answer	Skip to Cool1

EMS2. If there is no EMS, is there another system that controls equipment based on temperature or occupancy schedule?

1. <input type="checkbox"/> Yes	
2. <input type="checkbox"/> No	Skip to Cool1
97. <input type="checkbox"/> Don't know	Skip to Cool1
98. <input type="checkbox"/> Refused to answer	Skip to Cool1

EMS3. Is the system working properly?

1. <input type="checkbox"/> Yes
2. <input type="checkbox"/> No
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

EMS4. What end uses are controlled with the EMS (or similar system)?:

End Use	1. Yes	2. No	97. Don't know	98. Refused to answer
1. Interior lighting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Outside lighting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Chiller	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Boiler	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Packaged HVAC unit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Air handler unit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Refrigeration system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Other (Describe: _____)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

COOLING ☐ N/A

Cool 1. Cooling Characteristics

Cooling Characteristic	1. System #1	2. System #2	3. System #3
a. Cooling Equipment Refer to Cooling Equipment Codes If Code=10, describe:	Cooling Code: __ __ _____	Cooling Code: __ __ _____	Cooling Code: __ __ _____
b. Fuel type Refer to Fuel Codes If Code=03, describe:	Fuel Code#: __ __ _____	Fuel Code#: __ __ _____	Fuel Code#: __ __ _____
c. % of cooled ft² cooled by system	__ __ __ % DK R	__ __ __ % DK R	__ __ __ % DK R
d. Capacity Check unit of measurement: Tons OR BTUs	Enter #: _____ <input type="checkbox"/> Tons <input type="checkbox"/> MMBTUs DK R	Enter #: _____ <input type="checkbox"/> Tons <input type="checkbox"/> MMBTUs DK R	Enter #: _____ <input type="checkbox"/> Tons <input type="checkbox"/> MMBTUs DK R
e. Age of cooling system *Note average age if system contains different ages of equipment	_____ # of years DK R	_____ # of years DK R	_____ # of years DK R
f. Number of units	Enter #: _____ DK R	Enter #: _____ DK R	Enter #: _____ DK R
g. Did company specify that this new equipment be energy efficient? [Skip if age >=5yrs]	Y N DK R	Y N DK R	Y N DK R
h. System Condition Refer to System Condition Codes	System Condition Code: __ __ 	System Condition Code: __ __ 	System Condition Code: __ __
i. How often is maintenance performed? Refer to Maintenance Codes	Maintenance Code: __ __ 	Maintenance Code: __ __ 	Maintenance Code: __ __
j. How many months per year does this system run?	_____ # of months DK R	_____ # of months DK R	_____ # of months DK R
k. About how many hours is the cooling system running each day it is used? Refer to Cooling Hours Codes	Cooling Hours Code: __ __ 	Cooling Hours Code: __ __ 	Cooling Hours Code: __ __

Cooling Equipment Codes
01: Water-cooled Chiller (cooling towers or water cooler present)
02: Air-cooled Chiller
03: Packaged heat pumps for cooling
04: Rooftop/Packaged AC (also known as DX or direct expansion units)
05: DX Split Systems
06: Absorption gas or steam (chillers or heat pumps)
07: Packaged Terminal Air Conditioner (PTAC)
08: Individual room air conditioners, other than heat pumps
09: District chilled water piped in from outside the building
10: Other cooling equipment (Describe)
97: Don't know
98: Refused to answer
Fuel Codes
01: Electricity
02: Natural Gas
03: Other (Please describe)
97: Don't know
98: Refused to answer
System Condition Codes
01: In good condition
02: Needs maintenance/repair
03: Needs replacement
97: Don't know
98: Refused to answer
Maintenance Codes
01: More than once a year
02: Annually
03: Every two years
04: More than two to every five years
05: More than 5 years
06: As needed
07: Never
97: Don't know
98: Refused to answer
Cooling Hours Codes
01: Less than 4 hours
02: More than 4 hours to 8 hours
03: More than 8 hours to 12 hours
04: More than 12 hours to 16 hours
05: More than 16 hours to 20 hours
06: More than 20 hours
07: Run continuously
97: Don't know
98: Refused to answer
Note: Hours represent # of hours that the system is in active cooling mode versus setback mode, but not the actual run time of the equipment.

Cool 2. Are any of the following measures installed in the facility?

[Circle N for each measure that is Not Applicable]

[See Guidebook for examples of controls and measures]

Cooling System	Measure			
	a. High-efficiency Packaged DX System (EER= 10.9)	b. High Efficiency Centrifugal Chiller (0.51kW/ton)	c. High-efficiency Packaged Terminal Air Conditioner (PTAC) system (EER = 9.6)	d. VSD for cooling tower fans
1. System #1	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R
	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R
	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R
2. System # 2	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R
	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R
	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R
3. System #3	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R
	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R
	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R

Cooling System	Measure			
	e. Economizers, air-side	f. Economizers, water-side	g. Programmable thermostat	h. Ductless (Mini split) Cooling System
1. System #1	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R
	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R
	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R
2. System # 2	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R
	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R
	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R
3. System #3	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R
	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R
	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R

Cool 2. (Cont'd)

Are any of the following measures installed in the facility?

[Circle N for each measure that is Not Applicable]

[See Guidebook for examples of controls and measures]

Cooling System	Measure			
	i. Ground/water source heat pumps	j. Heat pump heat recovery	k. Convert to water-cooled chiller	l. Premium efficiency pump motors
1. System #1	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R
	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R
	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R
2. System # 2	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R
	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R
	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R
3. System #3	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R
	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R
	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R

Cooling System	Measure			
	m. Oversized cooling towers	n. Hydronic variable flow (Water Loop Heat Pump) <i>System designed for variable fluid flow and reducing flow rates</i>	o. Cooling Circulation Pumps with Variable Speed Drives	p. Primary/secondary chilled water loops
1. System #1	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R
	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R
	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R
2. System # 2	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R
	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R
	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R
3. System #3	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R
	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R
	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R

SPACE HEATING ☐ N/A

SH1. Heating Characteristics

Heating Characteristic	1. System #1	2. System #2	3. System #3
a. Heating Equipment Refer to Heating Equipment Codes If Code=08, please describe:	Heating Code: _____ _____	Heating Code: _____ _____	Heating Code: _____ _____
b. Fuel type Refer to Fuel Codes If Code=09, please describe:	Fuel Code: _____ _____	Fuel Code: _____ _____	Fuel Code: _____ _____
c. % of all heating ft ² heated by system	_____% DK R	_____% DK R	_____% DK R
d. Capacity If only one number is available, put in the OUTPUT slot.	# of kBTUh: _____ INPUT _____ OUTPUT DK R	# of kBTUh: _____ INPUT _____ OUTPUT DK R	# of kBTUh: _____ INPUT _____ OUTPUT DK R
e. Number of units	Enter #:_____ DK R	Enter #:_____ DK R	Enter #:_____ DK R
f. Age of heating system *Note average age if system contains different ages of equipment	_____ # of years DK R	_____ # of years DK R	_____ # of years DK R
g. Did company specify that this new equipment be energy efficient? [Skip if age>=5yrs]	Y N DK R	Y N DK R	Y N DK R
h. System Condition Refer to System Condition Codes	System Condition Code: _____ _____	System Condition Code: _____ _____	System Condition Code: _____ _____
i. How often is maintenance performed? Refer to Maintenance Codes	Maintenance Code: _____ _____	Maintenance Code: _____ _____	Maintenance Code: _____ _____
j. How many months per year does this system run?	_____ # of months DK R	_____ # of months DK R	_____ # of months DK R
k. About how many hours is the heating system running each day it is used? Refer to Heating Hours Codes	Heating Hours Code: _____ _____	Heating Hours Code: _____ _____	Heating Hours Code: _____ _____

Heating Equipment Codes
01: Furnaces that heat air directly, no steam or water
02: Boilers inside the building that produce steam or hot water
03: Packaged heat pumps for heating
04: Rooftop or packaged heating units, other than heat pumps
05: Split heat pump system
06: Individual space heaters, other than heat pumps
07: District steam or hot water piped in from outside the building
08: Other heating equipment (Describe)
97: Don't know
98: Refused to answer
Fuel Codes
01: Electricity
02: Natural Gas
03: Oil
04: Kerosene
05: Bottled Gas or Propane
06: Wood
07: Coal
08: Solar
09: Other (Describe)
97: Don't know
98: Refused to answer
System Condition Codes
01: In good condition
02: Needs maintenance/repair
03: Needs replacement
97: Don't know
98: Refused to answer
Maintenance Codes
01: More than once a year
02: Annually
03: Every two years
04: More than two to every five years
05: More than 5 years
06: As needed
07: Never
97: Don't know
98: Refused to answer
Heating Hours Codes
01: Less than 4 hours
02: More than 4 hours to 8 hours
03: More than 8 hours to 12 hours
04: More than 12 hours to 16 hours
05: More than 16 hours to 20 hours
06: More than 20 hours
07: Run continuously
97: Don't know
98: Refused to answer
Note: Hours represent # of hours that the system is in active heating mode versus setback mode, but not the actual run time of the equipment.

SH2. Are any of the following measures installed at this facility

[Circle N for each measure that is Not Applicable]

[See Guidebook for examples of controls and measures]

Space Heating System	Measure					
	a. Programmable Thermostat	b. Pipe Insulation	c. Radiant heater	d. Hot water reset [Boilers]	e. Heat Recovery from AC	f. Heat Recovery from Refrigeration
1. System #1	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R
	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R
	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R
2. System # 2	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R
	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R
	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R
3. System #3	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R
	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R
	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R

Space Heating System	Measure				
	g. Stack Heat Exchanger	h. Air-Side Heat Recovery systems	i. Electronically commutated motors [located on furnace fans]	j. Insulated Overhead Doors	k. Demand Controlled Ventilation
1. System #1	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R
	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R
	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R
2. System # 2	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R
	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R
	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R
3. System #3	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R
	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R
	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R

Space Heating System	Measure					
	l. VSDs for pumps	m. High efficiency furnace/boiler (95% efficiency)	n. Conversion from resistance to heat pump	o. Heating lockout	p. High-efficiency heat pumps (AFUE>90%)	q. Condensing unit heaters
1. System #1	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R
	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R
	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R
2. System # 2	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R
	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R
	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R
3. System #3	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R
	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R
	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R

WATER HEATING ☐ N/A

WH1. Water heater characteristics

Water Heater System	a. % of all capacity	b. Water Heater Type Refer to Water Heater Type Codes If Code=07, Please describe:	c. Fuel Type Refer to Fuel Codes If Code=10, describe:	d. Tank Insulation?	e. Pipe Insulation ?	f. Pipe Insulation Feasible?	g. Demand Controlled Circulating System?
1. WH #1	____ % DK R	Water Heater Type Code: ____ If Code =01, high efficiency EF=.93)? Y N DK R _____	Fuel Code: ____ _____	Y N DK R	Y N DK R	Y N DK R	Y N DK R
2. WH #2	____ % DK R	Water Heater Type Code: ____ If Code =01, high efficiency EF=.93)? Y N DK R _____	Fuel Code: ____ _____	Y N DK R	Y N DK R	Y N DK R	Y N DK R
3. WH #3	____ % DK R	Water Heater Type Code: ____ If Code =01, high efficiency EF=.93)? Y N DK R _____	Fuel Code: ____ _____	Y N DK R	Y N DK R	Y N DK R	Y N DK R

Water Heater Type Codes	
01: Traditional water heater	07: Other (Describe)
02: Instantaneous (tankless)	97: Don't know
03: Condensing boiler	98: Refused to answer
04: Heat pump water heater	
05: Solar water heater	
06: Geothermal heat pump	

Fuel Codes	
01: Electric	07: Wood
02: Natural gas	08: Coal
03: Oil	09: Solar
04: Kerosene	10: Other (Describe)
05: District steam	97: Don't know
06: District hot water	98: Refused to answer

WH2. How many sinks are in the building space?

Enter # of sinks: _____	IF WH2=0, SKIP TO WH5
9999997. <input type="checkbox"/> Don't know	SKIP to WH5
9999998. <input type="checkbox"/> Refused to answer	SKIP to WH5

WH2a. What percentage of these sinks are used for commercial purposes?

Enter % of sinks: ____%	IF WH2a=0, SKIP TO WH5
997. <input type="checkbox"/> Don't know	SKIP to WH5
998. <input type="checkbox"/> Refused to answer	SKIP to WH5

WH3. How many low-flow faucet aerators are installed on these sinks?

[Low-flow is less than 2.5 gallons per minute]

Enter # of low-flow faucet aerators: _____	DK R
--	------

WH4. [Skip if WH2a=0] How many pre-rinse spray valves are installed on these sinks?

Enter # of pre-rinse spray valves: _____	DK R
--	------

WH5. Is drain water heat recovery used?

1. <input type="checkbox"/> Yes	3. <input type="checkbox"/> Other Describe: _____	97. <input type="checkbox"/> Don't Know
2. <input type="checkbox"/> No		98. <input type="checkbox"/> Refused to Answer

REFRIGERATION / FREEZING ☐ N/A**Non-Commercial Refrigerators/Freezers****RF1.** Are there any of the following **non-commercial** refrigerators or freezers? ☐ N/A

Equipment Description	a. Quantity	b. # Energy Star [Skip if Quantity = 0, DK or R]
1. Single-door	Enter #: <hr/> DK R	Enter #: <hr/> DK R
2. Two-door with top mounted freezer	Enter #: <hr/> DK R	Enter #: <hr/> DK R
3. Two-door with side door freezer	Enter #: <hr/> DK R	Enter #: <hr/> DK R
4. Three-door	Enter #: <hr/> DK R	Enter #: <hr/> DK R
5. Under counter	Enter #: <hr/> DK R	Enter #: <hr/> DK R
6. Chest freezer	Enter #: <hr/> DK R	Enter #: <hr/> DK R
7. Upright freezer	Enter #: <hr/> DK R	Enter #: <hr/> DK R
8. Other (Describe : _____)	Enter #: <hr/> DK R	Enter #: <hr/> DK R

Commercial Refrigerators/Freezers

RF2. What percent of floor space is used for commercial refrigeration, refrigerated warehouses or cold storage?

Enter % sq ft:	
997. <input type="checkbox"/> Don't know	IF 0, SKIP to Cook1
998. <input type="checkbox"/> Refused to answer	Skip to Cook1

RF3. Are there any of the following commercial refrigerators or freezers?

Refrigeration Equipment Description	a. Total Quantity	b. Total Length (ft) [Skip if Quantity = 0, DK or R]	c. How often is maintenance performed? [Skip if Quantity = 0, DK or R] Refer to Maintenance Codes
1. Glass Door Reach-In Refrigerator	Enter #: _____ DK R	Enter ft: _____ DK R	Maintenance Code: --
2. Glass Door Reach-In Freezer	Enter #: _____ DK R	Enter ft: _____ DK R	Maintenance Code: --
3. Solid Door Reach-In Refrigerator	Enter #: _____ DK R	Enter ft: _____ DK R	Maintenance Code: --
4. Solid Door Reach-In Freezer	Enter #: _____ DK R	Enter ft: _____ DK R	Maintenance Code: --
5. Glass door beverage cases (e.g. vendor supplied) from 2 to 4 doors	Enter #: _____ DK R	Enter ft: _____ DK R	Maintenance Code: --
6. Open upright display cases (pizza, juice, etc.) usually 4,5,6 ft lengths	Enter #: _____ DK R	Enter ft: _____ DK R	Maintenance Code: --
7. Island cases (cheese, sometimes produce or juice) from 8 to 16 ft long	Enter #: _____ DK R	Enter ft: _____ DK R	Maintenance Code: --
8. Service cases (bakery, sometimes deli) from 4 to 8 ft long	Enter #: _____ DK R	Enter ft: _____ DK R	Maintenance Code: --
9. Closed door storage cabinets (e.g. backbar storage cabinet for wine & beer)	Enter #: _____ DK R	Enter ft: _____ DK R	Maintenance Code: --
10. Coffin type glass top freezer cases (usually ice cream) typically 6 or 8 ft	Enter #: _____ DK R	Enter ft: _____ DK R	Maintenance Code: --
11. Ice storage boxes	Enter #: _____ DK R	Enter ft: _____ DK R	Maintenance Code: --
12. Walk-in coolers/freezers or cooled prep areas	Enter #: _____ DK R	Enter sq ft: _____ DK R	Maintenance Code: --
13. Other (Describe : _____)	Enter #: _____ DK R	Enter ft: _____ DK R	Maintenance Code: --

Maintenance Codes
01: More than once a year
02: Annually
03: Every 2 years
04: More than 2 years to every 5 years
05: More than 5 years
06: As needed
07: Never
97: Don't know
98: Refused to answer

RF4. Are any of the following refrigeration measures installed?

[Circle N for each measure that is Not Applicable; See Guidebook for examples of controls and measures]

Refrigeration System Refer to Refrigeration Equipment Codes	Measure						
	a. Strip curtains for walk-ins	b. Night covers for display cases	c. Electronically Commutated Motors (ECM)	d. Evaporator fan controller for walk-ins	e. Efficient compressor	f. Heat recovery	g. Compressor VSDs
1. System #1 Ref. Equip. Code #s: _____	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R
2. System #2 Ref. Equip. Code #s: _____	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R
3. System #3 Ref. Equip. Code #s: _____	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R

Refrigeration System Refer to Refrigeration Equipment Codes	Measure					
	h. Floating head pressure controls	i. Demand hot gas defrost	j. Demand electric defrost	k. Anti-sweat (humidistat) controls	l. Zero Energy Freezer Doors	m. Condenser fan VSD
1. System #1 Ref. Equip. Code #s: _____	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R
2. System #2 Ref. Equip. Code #s: _____	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R
3. System #3 Ref. Equip. Code #s: _____	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R

Refrigeration System Refer to Refrigeration Equipment Codes	Measure				
	n. Water-cooled condenser	o. Air curtains	p. Door closers on walk-ins	q. Multiplex compressors	r. LED lighting
1. System #1 Ref. Equip. Code #s: _____	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R
2. System #2 Ref. Equip. Code #s: _____	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R
3. System #3 Ref. Equip. Code #s: _____	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R

Refrigeration Equipment Codes
1: Glass Door Reach-In Refrigerator
2: Glass Door Reach-In Freezer
3: Solid Door Reach-In Refrigerator
4: Solid Door Reach-In Freezer
5: Glass door beverage cases
6: Open upright display cases
7: Island cases
8: Service cases
9: Closed door storage cabinets
10: Coffin type glass top freezer cases
11: Ice storage boxes
12: Walk-in coolers/freezers or cooled prep areas
13: Other
97: Don't know
98: Refused to answer

COOKING EQUIPMENT

Cook1. Does this building contain commercial cooking equipment?

1. <input type="checkbox"/> Yes	
2. <input type="checkbox"/> No	SKIP TO Vend1
97. <input type="checkbox"/> Don't know	SKIP TO Vend1
98. <input type="checkbox"/> Refused to answer	SKIP TO Vend1

Cook2. How many of the following pieces of electric cooking equipment are used at this location?

Electric Equipment Description	a. Quantity	b. # Energy Star [Skip if Quantity = 0, DK or R]
1. Fryer	Enter #: _____ DK R	Enter #: _____ DK R
2. Steamer	Enter #: _____ DK R	Enter #: _____ DK R
3. Convection Oven	Enter #: _____ DK R	Enter #: _____ DK R
4. Griddle	Enter #: _____ DK R	Enter #: _____ DK R
5. Range	Enter #: _____ DK R	Enter #: _____ DK R

Cook3. How many of the following pieces of gas cooking equipment are used at this location?

Gas Equipment Description	a. Quantity	b. # Energy Star [Skip if Quantity = 0, DK or R]
1. Fryer	Enter #: _____ DK R	Enter #: _____ DK R
2. Steamer	Enter #: _____ DK R	Enter #: _____ DK R
3. Convection Oven	Enter #: _____ DK R	Enter #: _____ DK R
4. Griddle	Enter #: _____ DK R	Enter #: _____ DK R
5. Range	Enter #: _____ DK R	Enter #: _____ DK R

VENDING MACHINES

Vend1. How many refrigerated vending machines are at this location?

Enter # of machines: _____	If 0, Skip to Vent1
9999997. <input type="checkbox"/> Don't know	Skip to Vent1
9999998. <input type="checkbox"/> Refused to answer	Skip to Vent 1

Vend2. How many of these have vending miser controls?

[\[Vending miser controls are an energy efficiency product for vending machines that manages the power consumption of a vending machine.\]](#)

Enter # of machines with miser controls: _____ DK R

VENTILATION ☐ N/A

Vent1. Ventilation Characteristics

Fan Motor #	a. Fan Motor hp	b. Quantity [Skip if Fan Motor hp = 0, DK or R]	c. How often is maintenance performed? Refer to Maintenance Codes
1. Fan Motor System #1	Enter hp: _____ DK R	Enter #: _____ DK R	Maintenance Code: _ _
2. Fan Motor System #2	Enter hp: _____ DK R	Enter #: _____ DK R	Maintenance Code: _ _
3. Fan Motor System #3	Enter hp: _____ DK R	Enter #: _____ DK R	Maintenance Code: _ _
4. Fan Motor System #4	Enter hp: _____ DK R	Enter #: _____ DK R	Maintenance Code: _ _
5. Fan Motor System #5	Enter hp: _____ DK R	Enter #: _____ DK R	Maintenance Code: _ _

Maintenance Codes	
01: More than once a year 02: Annually 03: Every 2 years 04: More than 2 years to every 5 years 05: More than 5 years	06: As needed 07: Never 97: Don't know 98: Refused to answer

Vent2. Are any of the following ventilation measures installed?

Measure	a. Premium efficiency fan motors	b. VSD Fans	c. Air Handler Optimization	d. Outside air intake controls (CO2, etc.)	e. Direct digital control of VAV boxes	f. Conversion to VAV from CV
1. System #1	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R
2. System # 2	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R
3. System #3	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R
4. System # 4	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R
5. System #5	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R

LIGHTING

Light1. Interior Lighting Information

<u>LIGHTING TYPE</u>	1. T5 Fixtures (<4 foot fixtures; 1 or 2 lamps)	2. Standard T8 Fixtures (4 foot fixtures; 1 or 2 lamps)
Total # of Fluorescent Fixtures (4ft 1 or 2 lamps)	Enter #: _____ DK R	Enter #: _____ DK R
a. % Fixtures with Reflectors	___ % DK R	___ % DK R
b. % Under Control of Occupancy Sensors	___ % DK R	___ % DK R
c1. % Under Control of Daylight Sensors	% Daylight Control: ___ % DK R	% Daylight Control: ___ % DK R
c2. %Feasible?	% Feasible: ___ % DK R	% Feasible: ___ % DK R

<u>LIGHTING TYPE</u>	3. High Perf. T8 Fixtures (4 foot fixtures; 1 or 2 lamps)	4. T12 Fixtures (4 foot fixtures; 1 or 2 lamps)
Total # of Fluorescent Fixtures (4ft 1 or 2 lamps)	Enter #: _____ DK R	Enter #: _____ DK R
a. % Fixtures with Reflectors	___ % DK R	___ % DK R
b. % Under Control of Occupancy Sensors	___ % DK R	___ % DK R
c1. % Under Control of Daylight Sensors	% Daylight Control: ___ % DK R	% Daylight Control: ___ % DK R
c2. %Feasible?	% Feasible: ___ % DK R	% Feasible: ___ % DK R

<u>LIGHTING TYPE</u>	5. T5 Fixtures (<4 foot fixtures; 3 or more lamps)	6. Standard T8 Fixtures (4 foot fixtures; 3 or more lamps)
Total # of Fluorescent Fixtures (4ft - 3 or more lamps)	Enter #: _____ DK R	Enter #: _____ DK R
a. % Fixtures with Reflectors	___ % DK R	___ % DK R
b. % Under Control of Occupancy Sensors	___ % DK R	___ % DK R
c1. % Under Control of Daylight Sensors	% Daylight Control: ___ % DK R	% Daylight Control: ___ % DK R
c2. %Feasible?	% Feasible: ___ % DK R	% Feasible: ___ % DK R

Light1. (Cont'd)

Interior Lighting Information

<u>LIGHTING TYPE</u>	7. High Perf. T8 Fixtures (4 foot fixtures; 3 or more lamps)	8. T12 Fixtures (4 foot fixtures; 3 or more lamps)
Total # of Fluorescent Fixtures (4ft - 3 or more lamps)	Enter #: _____ DK R	Enter #: _____ DK R
a. % Fixtures with Reflectors	___ % DK R	___ % DK R
b. % Under Control of Occupancy Sensors	___ % DK R	___ % DK R
c1. % Under Control of Daylight Sensors	% Daylight Control: ___ % DK R	% Daylight Control: ___ % DK R
c2. % Feasible?	% Feasible: ___ % DK R	% Feasible: ___ % DK R

<u>LIGHTING TYPE</u>	9. Standard T8 Fixtures (8 foot fixtures; Any # of lamps)	10. High Perf. T8 Fixtures (8 foot fixtures; Any # of lamps)	11. T12 Fixtures (8 foot fixtures; Any # of lamps)
Total # of Fluorescent Fixtures (5ft or longer-Any # of lamps)	Enter #: _____ DK R	Enter #: _____ DK R	Enter #: _____ DK R
a. % Fixtures with Reflectors	___ % DK R	___ % DK R	___ % DK R
b. % Under Control of Occupancy Sensors	___ % DK R	___ % DK R	___ % DK R
c1. % Under Control of Daylight Sensors	% Daylight Control: ___ % DK R	% Daylight Control: ___ % DK R	% Daylight Control: ___ % DK R
c2. % Feasible?	% Feasible: ___ % DK R	% Feasible: ___ % DK R	% Feasible: ___ % DK R

% of Building Square Footage Illuminated by any type of Tube Fluorescent Lighting [no CFL's]	___ % DK R
---	----------------------

Light1. (Cont'd)
Interior Lighting Information

12. Incandescents/CFLs	
a. Total # of Incandescents	Enter #: _____ DK R
b. Total # of CFL'S	Enter # Screw-in CFL: _____ DK R Enter # Hardwired CFL: _____ DK R
c. % Fixtures Feasible for <u>Hardwired</u> CFL's	_____% DK R
d. % of Building Square Footage Illuminated by any Incandescents or CFLs	_____% DK R

High Intensity Discharge (HID) Lamps	13. Total # of Metal Halide	14. Total # of Pulse-Start Metal Halide	15. Total # of High Pressure Sodium	16. Total # of Mercury Vapor
a. Total # of lamps	Enter #: _____ DK R	Enter #: _____ DK R	Enter #: _____ DK R	Enter #: _____ DK R
b. % w/ Hi/Low or Bi-Level Control	_____% DK R	_____% DK R	_____% DK R	_____% DK R
c. % Hi/Low or Bi-Level Control Feasible	_____% DK R	_____% DK R	_____% DK R	_____% DK R
d. % of Building Square Footage Illuminated by any HID type bulb	_____% DK R			

Light2. Have you replaced high intensity discharge indoor lighting, such as high bay metal halide fixtures, with T5 or T8 fluorescent lighting? ☐ N/A

1. <input type="checkbox"/> Yes (What percent: ____%) DK R
2. <input type="checkbox"/> No
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

Light3. Lighting System Maintenance

Lighting System	a. How often are lighting control tune-ups performed?*	b. How often is the control strategy revisited?	c. Last time a major upgrade was performed on the lighting system?
	Refer to Control Tune-Up Codes	Refer to Strategy Codes	
Complete Lighting System	Maintenance Code#: — —	Strategy Code: — —	____ Years DK R

*Lighting Controls Tune-Up

Periodically, lighting controls need to be calibrated. Photocell sensors may fall into disrepair over time, occupancy sensor control settings may not be configured to result in maximum energy savings, and timeclock controls may not result in sufficient precision. Some buildings may also have light sweeping controls and load shedding dimmer controls for demand reduction that should be tuned up. Spaces can be under-lit as a result of dirty fixtures which should be cleaned as part of a tune up.

Control Tune-Up Codes
01: More than once a year
02: Annually
03: Every 2 years
04: More than 2 years to every 5 years
05: More than 5 years
06: As needed
07: Never
97: Don't know
98: Refused to answer

Strategy Codes
01: More than once a year
02: Annually
03: Every 2 years
04: More than 2 years to every 5 years
05: More than 5 years
06: As needed
97: Don't know
98: Refused to answer

Light4. How many exit signs are installed in the building?

Enter number: _____	If L4=0 SKIP TO L5
999997. <input type="checkbox"/> Don't know	SKIP TO L5
999998. <input type="checkbox"/> Refused to answer	SKIP TO L5

Light4a. What percentage of the building's exit signs are...

1. % LED	__ __ % DK R
2. % CFL	__ __ % DK R
3. % Incandescent	__ __ % DK R
4. % Other (Please describe: _____)	__ __ % DK R

Light5. Does this building have outdoor lighting?

1. <input type="checkbox"/> Yes	
2. <input type="checkbox"/> No	Skip to Pool1
97. <input type="checkbox"/> Don't know	Skip to Pool1
98. <input type="checkbox"/> Refused to answer	Skip to Pool1

Light6. Outdoor Lighting Information

[% of all lighting types should add up to 100% (but can be more)]

<u>LIGHTING TYPE</u>	a. % of all FT2	b. # of Fixtures	c. % Fixture sub-types	d. % w/ Manual Switches	e. % w/ Photocells	f. % w/ Timers or Other Controls
1. Fluorescent Tubes:	___ % DK R	Enter #: _____ DK R	<u>% that are T-8</u> ___ % DK R	___ % DK R	___ % DK R	___ % DK R
2. Incandescent/ CFL bulbs (Smaller wattage)	___ % DK R	Enter #: _____ DK R	<u>% that are CFL</u> ___ % DK R	___ % DK R	___ % DK R	___ % DK R
3. Quartz Halogen	___ % DK R	Enter #: _____ DK R	N/A	___ % DK R	___ % DK R	___ % DK R
4. Metal Halide	___ % DK R	Enter #: _____ DK R	N/A	___ % DK R	___ % DK R	___ % DK R
5. Pulse Start Metal Halide	___ % DK R	Enter #: _____ DK R	N/A	___ % DK R	___ % DK R	___ % DK R
6. High Pressure Sodium	___ % DK R	Enter #: _____ DK R	N/A	___ % DK R	___ % DK R	___ % DK R
7. Mercury Vapor	___ % DK R	Enter #: _____ DK R	N/A	___ % DK R	___ % DK R	___ % DK R
8. Other	% of FT2 ___ % DK R	Enter #: _____ DK R	Please describe:			

Fixture Counts Work Space – For Surveyor

POOL / HOT TUB

Pool1. Is there a pool and/or hot tub at this facility?

1. <input type="checkbox"/> Yes	
2. <input type="checkbox"/> No	Skip to OE1
97. <input type="checkbox"/> Don't Know	Skip to OE1
98. <input type="checkbox"/> Refused to Answer	Skip to OE1

Pool2. Pool / Hot Tub description(s)

Pool/Hot Tub #	a. Size of Pool/Hot Tub	b. Pool/Hot Tub Heated?	c. Fuel Type Refer to Fuel Codes If Code=07, Describe:	d. Pool/Hot Tub have a cover?
1. Pool/Hot Tub #1	_____ sq ft DK R	Y N DK R	Fuel Code: __ __ _____	Y N DK R
2. Pool/Hot Tub #2	_____ sq ft DK R	Y N DK R	Fuel Code: __ __ _____	Y N DK R
3. Pool/Hot Tub #3	_____ sq ft DK R	Y N DK R	Fuel Code: __ __ _____	Y N DK R
4. Pool/Hot Tub #4	_____ sq ft DK R	Y N DK R	Fuel Code: __ __ _____	Y N DK R
5. Pool/Hot Tub #5	_____ sq ft DK R	Y N DK R	Fuel Code: __ __ _____	Y N DK R

Fuel Codes
01: Electricity
02: Natural Gas
03: Bottled gas or propane
04: Solar Thermal and Electricity
05: Solar Thermal and Natural Gas
06: Other (Describe)
07: Pool not heated
97: Don't know
98: Refused to answer

OFFICE EQUIPMENT ☐ N/A

[Estimates are fine if exact numbers are difficult to obtain]

OE1. How many desktop computers are used in this facility?

Enter # of computers: _____	Skip to OE5 if 0
9999997. <input type="checkbox"/> Don't know	Skip to OE5
9999998. <input type="checkbox"/> Refused to answer	Skip to OE5

OE2. How many desktop LCD monitors are there? Include separate monitors used for laptops.

Enter # of LCD monitors: _____	Skip to OE3 if 0
9999997. <input type="checkbox"/> Don't know	Skip to OE3
9999998. <input type="checkbox"/> Refused to answer	Skip to OE3

OE2a. What percentage of the LCD monitors are Energy Star rated?

Enter % of LCD monitors that are Energy Star rated: _____	DK R
--	---------------

OE3. How many desktop CRT monitors are there?

Enter # of CRT monitors: _____	Skip to OE4 if 0
9999997. <input type="checkbox"/> Don't know	Skip to OE4
9999998. <input type="checkbox"/> Refused to answer	Skip to OE4

OE3a. What percentage desktop CRT monitors are Energy Star rated?

Enter % of LCD monitors that are Energy Star rated: _____	DK R
--	---------------

OE4. Which of the following describes what usually happens when company employees are done using a desktop computer? [There can be more than one response]

1. <input type="checkbox"/> Leave it on so it will be ready the next time they want to use it	3. <input type="checkbox"/> Turn off the computer	97. <input type="checkbox"/> Don't know
2. <input type="checkbox"/> Put it in sleep mode	4. <input type="checkbox"/> Turn off the monitor	98. <input type="checkbox"/> Refused to answer

OE5. How many laptop computers are used at this facility?

[Don't count laptops used with docking stations and monitors]

Enter # of laptops: _____	Skip to OE7 if 0
9999997. <input type="checkbox"/> Don't know	Skip to OE7
9999998. <input type="checkbox"/> Refused to answer	Skip to OE7

OE5a. What percentage laptops are Energy Star rated?

Enter % of laptops that are Energy Star rated: _____	DK R
---	---------------

OE6. Which of the following describes what usually happens when company employees are done using a laptop computer? [There can be more than one response]

1. <input type="checkbox"/> Leave it on so it will be ready the next time they want to use it	3. <input type="checkbox"/> Turn off the computer	97. <input type="checkbox"/> Don't know
2. <input type="checkbox"/> Put it in sleep mode	4. <input type="checkbox"/> Turn off the monitor	98. <input type="checkbox"/> Refused to answer

[This includes copiers, printers, fax machines etc.]

Enter # of office machines: _____	Skip OE8 and OE9 if 0
9999997. <input type="checkbox"/> Don't know	Skip OE8 and OE9
9999998. <input type="checkbox"/> Refused to answer	Skip OE8 and OE9

Enter % of Energy Star multifunction machines: _____ **DK R**

1. <input type="checkbox"/> Leave on so they will be ready	3. <input type="checkbox"/> Turn off the office machine	97. <input type="checkbox"/> Don't know
2. <input type="checkbox"/> Put it in sleep mode	4. <input type="checkbox"/> Unplug (in order to reduce phantom load)	98. <input type="checkbox"/> Refused to answer

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

<p align="center">Rhode Island EERMC Industrial Survey</p>

SITE INFORMATION	
SITE ID:	
SI1. Building Name:	
SI2. Street Address:	
SI3. City, State:	
SI4. Zip Code:	
SI5. Building Phone:	
SI6. Primary Contact Name:	
SI7. Primary Contact Phone:	
SI8. Primary Contact Email:	
SI9. Primary Contact Fax:	
SI10. Secondary Contact Name:	
SI11. Secondary Contact Phone:	
SI12. Secondary Contact Email:	
SI13. Secondary Contact Fax:	

SURVEY TRACKING INFORMATION		
TASK	a. DATE	b. NAME
ST1. Field survey completed:		
ST2. Field survey paperwork completed:		

GENERAL BUILDING INFORMATION

Site Activity: What are the major industrial processes at the site?

	a. Activity Code Refer to Site Activity Code	b. If Activity Code = 15, please describe:	c. % of Building Space
SA1. Site Activity 1	--		---% DK R
SA2. Site Activity 2	--		---% DK R
SA3. Site Activity 3	--		---% DK R
SA4. Site Activity 4	--		---% DK R
SA5. Site Activity 5	--		---% DK R

Site Activity Codes
01: Food
02: Textiles- Apparel
03: Lumber- Furniture
04: Paper
05: Chemicals
06: Petroleum
07: Rubber-Plastics
08: Non-metallic minerals
09: Primary Metals
10: Fabricated Metals
11: Industrial Machinery
12: Electronics
13: Transportation Equipment
14: Printing/ Publishing
15: Miscellaneous (Describe)...(e.g., Warehouse, Office)

TO BE FILLED OUT BY KEMA STAFF**[Surveyors –fill this section out from KEMA supplied data from utility]**

GBE. Total Annual Electricity Load	_____ kWh DK N NA
GBNG. Total Annual Natural Gas Load	_____ therms DK N NA

GB1a. Which of the following fuels or power sources are used in this facility? Do you use...
[Check all that apply]

1. <input type="checkbox"/> Electricity	7. <input type="checkbox"/> Purchased Steam
2. <input type="checkbox"/> Natural Gas	8. <input type="checkbox"/> Purchased Hot or Chilled Water
3. <input type="checkbox"/> Coal	9. <input type="checkbox"/> Other (Describe: _____)
4. <input type="checkbox"/> Fuel Oil	97. <input type="checkbox"/> Don't Know
5. <input type="checkbox"/> Propane/LPG, Bottled Gas	98. <input type="checkbox"/> Refused to Answer
6. <input type="checkbox"/> Kerosene	

GB1b. What is your best estimate of your average monthly total energy bills for the following fuels paid by your firm for this location?

Fuel Type	Average Monthly Bill
GB1b1. Electricity	Enter \$: S: _____ / W: _____ DK R DK R
GB1b2. Natural Gas	Enter \$: S: _____ / W: _____ DK R DK R
GB1b3. Coal	Enter \$: S: _____ / W: _____ DK R DK R
GB1b4. Fuel Oil	Enter \$: S: _____ / W: _____ DK R DK R
GB1b5. Propane/LPG, Bottled Gas	Enter \$: S: _____ / W: _____ DK R DK R
GB1b6. Kerosene	Enter \$: S: _____ / W: _____ DK R DK R
GB1b7. Purchased Steam	Enter \$: S: _____ / W: _____ DK R DK R
GB1b8. Purchased Hot or Chilled Water	Enter \$: S: _____ / W: _____ DK R DK R
GB1b9. Other (Describe: _____)	Enter \$: S: _____ / W: _____ DK R DK R

GB1c. Heating Fuel Use Consumption

End Use	Percent of Overall MMBTU Consumption
GB1d1. Process Heat Boilers	Enter %: ___ DK N NA
GB1d2. Process Heat (Non-Boiler)	Enter %: ___ DK N NA
GB1d3. Refrigeration/Process Cooling (Only if heat absorption drives cooling process.)	Enter %: ___ DK N NA
GB1d4. Space Cooling (Only if heat absorption drives cooling process.)	Enter %: ___ DK N NA
GB1d5. Space Heating	Enter %: ___ DK N NA
GB1d6. Other (Describe: _____)	Enter %: ___ DK N NA

Should Total 100%**GB1d. Electricity End Use Consumption**

End Use	Percent of Overall kWh Consumption
GB1c1. Compressors	Enter %: ___ DK N NA
GB1c2. Pumps	Enter %: ___ DK N NA
GB1c3. Motors	Enter %: ___ DK N NA
GB1c4. Refrigeration/Process Cooling	Enter %: ___ DK N NA
GB1c5. Space Cooling	Enter %: ___ DK N NA
GB1c6. Space Heating	Enter %: ___ DK N NA
GB1c7. Interior Lighting	Enter %: ___ DK N NA
GB1c8. Exterior Lighting	Enter %: ___ DK N NA
GB1c9. Other (Describe: _____)	Enter %: ___ DK N NA

Should Total 100%

General Building Characteristics:

GB2. Total floor area of facility	$\frac{\text{ft}^2}{\text{DK} \quad \text{R}}$
GB3. Total floor area occupied by your facility	$\frac{\text{ft}^2}{\text{DK} \quad \text{R}}$
GB4. Time since last major remodel/ process overhaul	$\frac{\text{years}}{\text{DK} \quad \text{R}}$
GB5. Building commissioned within the past 5 yrs.? <i>Commissioning is the process of overseeing equipment startup and testing to make sure systems are operating as designed.</i>	Y N DK R
GB6. Is the Building ENERGY STAR certified?	Y N DK R
GB7. Is the building LEED certified?	Y N DK R

GB8. What year was this facility constructed?*[If there have been major additions, give year largest portion of the building was completed]*

1. <input type="checkbox"/> Before 1950	4. <input type="checkbox"/> 1990 to	7. <input type="checkbox"/> <i>[If unsure, but can make educated guess]</i> Provide best estimate: _____
2. <input type="checkbox"/> 1950 to 1979	5. <input type="checkbox"/> 2000 to	97. <input type="checkbox"/> Don't know
3. <input type="checkbox"/> 1980 to 1989	6. <input type="checkbox"/> 2005 to	98. <input type="checkbox"/> Refused to answer

GB9. Is this company the owner of this facility or does the company lease this space?

1. <input type="checkbox"/> Owner	2. <input type="checkbox"/> Lessee/Tenant	97. <input type="checkbox"/> Don't know	98. <input type="checkbox"/> Refused to answer
-----------------------------------	---	---	--

GB10. Job title or role of primary contact(s) *[Can select more than one response]*

1. <input type="checkbox"/> Owner / President / CEO	7. <input type="checkbox"/> Principal or Superintendent <i>(if education setting)</i>
2. <input type="checkbox"/> Manager or Director of Facilities / Maintenance / Buildings & Grounds	8. <input type="checkbox"/> Vice President
3. <input type="checkbox"/> Energy Manager or Director	9. <input type="checkbox"/> Other (Describe: _____)
4. <input type="checkbox"/> Facility Engineer	
5. <input type="checkbox"/> CFO / Controller / Treasurer	97. <input type="checkbox"/> Don't know
6. <input type="checkbox"/> Plant Manager	98. <input type="checkbox"/> Refused to answer

GB11a. Does the company pay for the electricity their space uses?

1. <input type="checkbox"/> Yes, company pays all	97. <input type="checkbox"/> Don't know
2. <input type="checkbox"/> Yes, company pays a portion	98. <input type="checkbox"/> Refused to answer
3. <input type="checkbox"/> No, company does not pay	

GB11b. Does the company pay for the natural gas their space uses?

1. <input type="checkbox"/> Yes, company pays all	97. <input type="checkbox"/> Don't know
2. <input type="checkbox"/> Yes, company pays a portion	98. <input type="checkbox"/> Refused to answer
3. <input type="checkbox"/> No, company does not pay	

GB12. How many hours per week is this facility operating?

[Do not consider the facility to be operating if only maintenance, housekeeping or security personnel are present]

Enter # of hours/week: _____	97. <input type="checkbox"/> Don't know	98. <input type="checkbox"/> Refused to answer
------------------------------	---	--

GB13. How many employees work in this facility during the main shift, that is, when most employees are present?

[Include volunteer/part-time workers, but do not include employees who always work outside the building, such as drivers with delivery routes]

1. <input type="checkbox"/> 1	5. <input type="checkbox"/> 21 to 50	9. <input type="checkbox"/> 501 to 1,000	97. <input type="checkbox"/> Don't know
2. <input type="checkbox"/> 2 to 5	6. <input type="checkbox"/> 51 to 100	10. <input type="checkbox"/> 1,001 to 3000	98. <input type="checkbox"/> Refused to answer
3. <input type="checkbox"/> 6 to 10	7. <input type="checkbox"/> 101 to 250	11. <input type="checkbox"/> More than 3,000	
4. <input type="checkbox"/> 11 to 20	8. <input type="checkbox"/> 251 to 500		

COMPRESSED AIR

Comp1. Is there compressed air at this facility?

1. <input type="checkbox"/> Yes	
2. <input type="checkbox"/> No	Skip to Next Section
97. <input type="checkbox"/> Don't know	Skip to Next Section
98. <input type="checkbox"/> Refused to answer	Skip to Next Section

Comp2. Compressed Air Characteristics

Compressor System	a. Age of system*	Compressor Motors		d. What kind of compressor? Refer to Compressed Air Equipment Code If Code=04, describe:	e. Average # of hours/week in use	f. Better motor practices in place?
		b. Motor Size	c. # of motors			
1. System #1	_____ # of years DK R	1. _____ hp DK R	1. _____ # of motors DK R	Compressed Air Code: ____ _____	_____ Avg # hrs/week DK R	1. Y N DK R
		2. _____ hp DK R	2. _____ # of motors DK R			2. Y N DK R
		3. _____ hp DK R	3. _____ # of motors DK R			3. Y N DK R
2. System #2	_____ # of years DK R	1. _____ hp DK R	1. _____ # of motors DK R	Compressed Air Code: ____ _____	_____ Avg # hrs/week DK R	1. Y N DK R
		2. _____ hp DK R	2. _____ # of motors DK R			2. Y N DK R
		3. _____ hp DK R	3. _____ # of motors DK R			3. Y N DK R
3. System #3	_____ # of years DK R	1. _____ hp DK R	1. _____ # of motors DK R	Compressed Air Code: ____ _____	_____ Avg # hrs/week DK R	1. Y N DK R
		2. _____ hp DK R	2. _____ # of motors DK R			2. Y N DK R
		3. _____ hp DK R	3. _____ # of motors DK R			3. Y N DK R

*Note average age if system contains different ages of equipment

Compressed Air Equipment Codes	
01:	Centrifugal
02:	Reciprocating
03:	Screw
04:	Other (Describe)
98:	Don't know
99:	Refused to answer

Comp3. Compressed Air Maintenance

Compressor System	a. How often is maintenance performed? Refer to Maintenance Codes	b. Are any efficiency measures or practices in place? If Yes, describe:	c. Do you have a regular leak detection program?	d. [If c is yes] Have leaks been detected and repaired under this program?	e. Variable Speed Drives
1. System #1	1. Maintenance Code: __	1. Y N DK R _____	1. Y N DK R	1. Y N DK R	1. App: Y N DK R 1. Inst: Y N DK R 1. Feas: Y N DK R
	2. Maintenance Code: __	2. Y N DK R _____	2. Y N DK R	2. Y N DK R	2. App: Y N DK R 2. Inst: Y N DK R 2. Feas: Y N DK R
	3. Maintenance Code: __	3. Y N DK R _____	3. Y N DK R	3. Y N DK R	3. App: Y N DK R 3. Inst: Y N DK R 3. Feas: Y N DK R
2. System #2	1. Maintenance Code: __	1. Y N DK R _____	1. Y N DK R	1. Y N DK R	1. App: Y N DK R 1. Inst: Y N DK R 1. Feas: Y N DK R
	2. Maintenance Code: __	2. Y N DK R _____	2. Y N DK R	2. Y N DK R	2. App: Y N DK R 2. Inst: Y N DK R 2. Feas: Y N DK R
	3. Maintenance Code: __	3. Y N DK R _____	3. Y N DK R	3. Y N DK R	3. App: Y N DK R 3. Inst: Y N DK R 3. Feas: Y N DK R
3. System #3	1. Maintenance Code: __	1. Y N DK R _____	1. Y N DK R	1. Y N DK R	1. App: Y N DK R 1. Inst: Y N DK R 1. Feas: Y N DK R
	2. Maintenance Code: __	2. Y N DK R _____	2. Y N DK R	2. Y N DK R	2. App: Y N DK R 2. Inst: Y N DK R 2. Feas: Y N DK R
	3. Maintenance Code: __	3. Y N DK R _____	3. Y N DK R	3. Y N DK R	3. App: Y N DK R 3. Inst: Y N DK R 3. Feas: Y N DK R

Maintenance Codes
01: More than once a year
02: Annually
03: Every 2 years
04: More than 2 years to every 5 years
05: More than 5 years
06: As needed
07: Never
97: Don't know
98: Refused to answer

Comp4. Note whether the following strategies were used to reduce energy use in the compressed air system

[\[See Guidebook for examples of controls and measures\]](#)

Compressor System	Strategy				
	a. Modulating Compressor Control	b. Variable Displacement Compressor Control	c. Load/No Load Compressor Controls	d. Online/Offline Compressor Control	e. Online - Idle/Offline Compressor Control (Dual Control)
1. System #1	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R
	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R
	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R
2. System #2	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R
	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R
	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R
3. System #3	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R
	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R
	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R

Comp4. (Cont'd)

Note whether the following strategies were used to reduce energy use in the compressed air system

[\[See Guidebook for examples of controls and measures\]](#)

Compressor System	Strategy				
	f. Installation of Staged Reciprocating Compressors	g. Compressed Air Storage	h. Use of Dryer System with Controls (i.e. to avoid constant use)	i. Compressed Air – Optimal Sizing	j. Heat Recovery from Compressor Systems
1. System #1	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R
2. System #2	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R
3. System #3	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R

Comp4. (Cont'd)

Note whether the following strategies were used to reduce energy use in the compressed air system.

[See Guidebook for examples of controls and measures]

Compressor System	Strategy			
	k. For Compressor Systems Installation of a Sequencer	l. For Compressor Systems Installation of System Master Controls	m. For Compressor Systems Installation of a Demand Expander	n. For Compressor Systems Reduction of System Pressure to Minimum Effective Pressure
1. System #1	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R
2. System #2	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R
3. System #3	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R

PROCESS FANS and BLOWER SYSTEMS

Fan1. Are there process fans or blower systems at this facility?

1. <input type="checkbox"/> Yes	
2. <input type="checkbox"/> No	Skip to Next Section
97. <input type="checkbox"/> Don't know	Skip to Next Section
98. <input type="checkbox"/> Refused to answer	Skip to Next Section

Fan2. Process Fans and Blower System Characteristics

Process Fans and Blower System	a. Age of system*	Process Fan Motors	
		b. Fan Motor Size	c. # of Fan Motors
1. System #1	_____ # of years DK R	1. _____ hp DK R 2. _____ hp DK R 3. _____ hp DK R	1. _____ # of motors DK R 2. _____ # of motors DK R 3. _____ # of motors DK R
2. System #2	_____ # of years DK R	1. _____ hp DK R 2. _____ hp DK R 3. _____ hp DK R	1. _____ # of motors DK R 2. _____ # of motors DK R 3. _____ # of motors DK R
3. System #3	_____ # of years DK R	1. _____ hp DK R 2. _____ hp DK R 3. _____ hp DK R	1. _____ # of motors DK R 2. _____ # of motors DK R 3. _____ # of motors DK R

[*Note average age if system contains different ages of equipment](#)

Fan2. Process Fans and Blower System Characteristics (Cont'd)

Process Fans and Blower System	d. Process Fan Use <i>Refer to Process Fan Codes</i> If Code=06, describe:	e. Average # of hours/ week in use	f. Are fan loads variable?	g. How are fans controlled? <i>Refer to Fan Control Codes</i> If Code=03, describe:	h. Better motor practices in place?
1. System #1	Process Fan Code : __ _____	Avg # hrs/week DK R	1. Y N DK R 2. Y N DK R 3. Y N DK R	1. Fan Control Code : __ _____ 2. Fan Control Code : __ _____ 3. Fan Control Code : __ _____	1. Y N DK R 2. Y N DK R 3. Y N DK R
2. System #2	Process Fan Code : __ _____	Avg # hrs/week DK R	1. Y N DK R 2. Y N DK R 3. Y N DK R	1. Fan Control Code : __ _____ 2. Fan Control Code : __ _____ 3. Fan Control Code : __ _____	1. Y N DK R 2. Y N DK R 3. Y N DK R
3. System #3	Process Fan Code : __ _____	Avg # hrs/week DK R	1. Y N DK R 2. Y N DK R 3. Y N DK R	1. Fan Control Code : __ _____ 2. Fan Control Code : __ _____ 3. Fan Control Code : __ _____	1. Y N DK R 2. Y N DK R 3. Y N DK R

Process Fan Codes	
01: Drying	06: Other (Please describe)
02: Water Mixing/Agitation	97: Don't know
03: Cooling	98: Refused to answer
04: Dust Removal	
05: Ventilation	

Fan Control Codes
01: VSD
02: Inlet/outlet dampers
03: Other (Please describe)
97: Don't know
98: Refused to answer

Fan3. Fan and Blower System Maintenance

Process Fans and Blower System	a. How often is maintenance performed? Refer to Maintenance Codes	b. Are any efficiency measures or practices in place? If Yes, describe:	c. Are NEMA premium efficiency motors installed?	d. When motors are replaced, are NEMA premium purchased?	e. Has the system been reviewed to determine if components can be improved?	f. [If e is yes] Have the components been improved?
1. System #1	1. Maintenance Code: -- 2. Maintenance Code: -- 3. Maintenance Code: --	1. Y N DK R _____ 2. Y N DK R _____ 3. Y N DK R _____	1. Y N DK R 2. Y N DK R 3. Y N DK R	1. Y N DK R 2. Y N DK R 3. Y N DK R	Y N DK R	Y N DK R
2. System # 2	1. Maintenance Code: -- 2. Maintenance Code: -- 3. Maintenance Code: --	1. Y N DK R _____ 2. Y N DK R _____ 3. Y N DK R _____	1. Y N DK R 2. Y N DK R 3. Y N DK R	1. Y N DK R 2. Y N DK R 3. Y N DK R	Y N DK R	Y N DK R
3. System #3	1. Maintenance Code: -- 2. Maintenance Code: -- 3. Maintenance Code: --	1. Y N DK R _____ 2. Y N DK R _____ 3. Y N DK R _____	1. Y N DK R 2. Y N DK R 3. Y N DK R	1. Y N DK R 2. Y N DK R 3. Y N DK R	Y N DK R	Y N DK R

Maintenance Codes
01: More than once a year
02: Annually
03: Every 2 years
04: More than 2 years to every 5 years
05: More than 5 years
06: As needed
07: Never
97: Don't know
98: Refused to answer

Fan4. Note if the following strategies were used to reduce energy use in fan or blower system

[\[See Guidebook for examples of controls and measures\]](#)

Process Fans and Blower System	Strategy				
	a. Installation of controls	b. System Optimization	c. Optimization of Drying Process	d. Clean Room Controls	e. Clean Room Design
1. System #1	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R
	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R
	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R
2. System #2	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R
	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R
	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R
3. System #3	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R
	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R
	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R

PUMPS

Pump1. Are there pumps used for process loads at this facility?

1. <input type="checkbox"/> Yes	
2. <input type="checkbox"/> No	Skip to Next Section
97. <input type="checkbox"/> Don't know	Skip to Next Section
98. <input type="checkbox"/> Refused to answer	Skip to Next Section

Pump2. Pump System Characteristics

Pump System	a. Age of system*	Pump Motors		d. What kind of pump? Refer to Pump Codes If Code=03, describe:	e. Pump Use Refer to Pump Use Codes If Code=05, describe:
		b. Motor Size	c. # of motors		
1. System #1	_____ # of years DK R	1. _____ hp DK R 2. _____ hp DK R 3. _____ hp DK R	1. _____ # of motors DK R 2. _____ # of motors DK R 3. _____ # of motors DK R	Pump Code: __ _____	Pump Use Code: __ _____
2. System #2	_____ # of years DK R	1. _____ hp DK R 2. _____ hp DK R 3. _____ hp DK R	1. _____ # of motors DK R 2. _____ # of motors DK R 3. _____ # of motors DK R	Pump Code: __ _____	Pump Use Code: __ _____
3. System #3	_____ # of years DK R	1. _____ hp DK R 2. _____ hp DK R 3. _____ hp DK R	1. _____ # of motors DK R 2. _____ # of motors DK R 3. _____ # of motors DK R	Pump Code: __ _____	Pump Use Code: __ _____

*Note average age if system contains different ages of equipment

Pump Codes	Pump Use Codes
01: Centrifugal 02: Positive Displacement 03: Other (Please describe) 97: Don't know 98: Refused to answer	01: Hot Water 02: Chilled Water 03: Wastewater 04: Food Product 05: Other (Please describe) 97: Don't know 98: Refused to

Pump2. (Cont'd)
Pump System Characteristics

Pump System	f. Average # of hours/ week in use	g. Are pump loads variable?	h. How is flow controlled? See Flow Control Codes If Code = 6, describe:	i. Better motor practices in place?
1. System #1	_____ Avg # hrs/week DK R	Y N DK R	Flow Control Code: __ _____	1. Y N DK R 2. Y N DK R 3. Y N DK R
2. System # 2	_____ Avg # hrs/week DK R	Y N DK R	Flow Control Code: __ _____	1. Y N DK R 2. Y N DK R 3. Y N DK R
3. System #3	_____ Avg # hrs/week DK R	Y N DK R	Flow Control Code: __ _____	1. Y N DK R 2. Y N DK R 3. Y N DK R

Flow Control Codes
01: VSD's
02: 2-way valves
03: 3-way valves
04: Balancing valve
05: Manually
06: Other (Please describe)
97: Don't know
98: Refused to answer

Pump3. Pump System Maintenance

Pump System	a. How often is maintenance performed? <i>Refer to Maintenance Codes</i>	b. Are any efficiency measures or practices in place? <i>If Yes, describe:</i>	c. Are NEMA premium efficiency motors installed?	d. When motors are replaced, are NEMA premium purchased?
1. System #1	1. Maintenance Code: --	1. Y N DK R _____	1. Y N DK R	1. Y N DK R
	2. Maintenance Code: --	2. Y N DK R _____	2. Y N DK R	2. Y N DK R
	3. Maintenance Code: --	3. Y N DK R _____	3. Y N DK R	3. Y N DK R
2. System # 2	1. Maintenance Code: --	1. Y N DK R _____	1. Y N DK R	1. Y N DK R
	2. Maintenance Code: --	2. Y N DK R _____	2. Y N DK R	2. Y N DK R
	3. Maintenance Code: --	3. Y N DK R _____	3. Y N DK R	3. Y N DK R
3. System #3	1. Maintenance Code: --	1. Y N DK R _____	1. Y N DK R	1. Y N DK R
	2. Maintenance Code: --	2. Y N DK R _____	2. Y N DK R	2. Y N DK R
	3. Maintenance Code: --	3. Y N DK R _____	3. Y N DK R	3. Y N DK R

Maintenance Codes
01: More than once a year
02: Annually
03: Every 2 years
04: More than 2 years to every 5 years
05: More than 5 years
06: As needed
07: Never
97: Don't know
98: Refused to answer

Pump3. Pump System Maintenance

Pump System	e. Is the piping layout designed efficiently to reduce friction losses?	f. Has the system been reviewed to determine if the correct sized motors are in place?	g. [If f is yes] Are/have the correct sized motors been installed?
1. System #1	Y N DK R	1. Y N DK R 2. Y N DK R 3. Y N DK R	1. Y N DK R 2. Y N DK R 3. Y N DK R
2. System # 2	Y N DK R	1. Y N DK R 2. Y N DK R 3. Y N DK R	1. Y N DK R 2. Y N DK R 3. Y N DK R
3. System #3	Y N DK R	1. Y N DK R 2. Y N DK R 3. Y N DK R	1. Y N DK R 2. Y N DK R 3. Y N DK R

Pump4. Note if the following strategies were used to reduce energy use in pump system?

****Measures c, d, and e are for agriculture use only**

[See Guidebook for examples of controls and measures]

Pump System	Strategy				
	a. Installation of controls	b. System Optimization	c. Agricultural Use Only Low Pressure Nozzle	d. Agricultural Use Only Micro watering system	e. Agricultural Use Only Pump Retrofit
1. System #1	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R
	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R
	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R
2. System #2	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R
	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R
	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R
3. System #3	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R
	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R
	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R

PROCESS MOTORS

Motor1. Are there process motors used at this facility that are not used for compressed air, fans, blowers or pumps?

1. <input type="checkbox"/> Yes	
2. <input type="checkbox"/> No	Skip to Next Section
97. <input type="checkbox"/> Don't know	Skip to Next Section
98. <input type="checkbox"/> Refused to answer	Skip to Next Section

Motor2. Process Motor Characteristics

Process Motor System Describe System Use	a. Age of system* # of years DK R	Process Motors		d. Average # of hours/week in use Avg # hrs/week DK R	e. # of Variable Speed Drives installed 1. _____ hp DK R 2. _____ hp DK R 3. _____ hp DK R	f. Better motor practices in place? 1. Y N DK R 2. Y N DK R 3. Y N DK R
		b. Motor Size	c. # of motors			
1. System #1 _____		1. _____ hp DK R 2. _____ hp DK R 3. _____ hp DK R	1. _____ # of motors DK R 2. _____ # of motors DK R 3. _____ # of motors DK R			
2. System #2 _____		1. _____ hp DK R 2. _____ hp DK R 3. _____ hp DK R	1. _____ # of motors DK R 2. _____ # of motors DK R 3. _____ # of motors DK R			
3. System #3 _____		1. _____ hp DK R 2. _____ hp DK R 3. _____ hp DK R	1. _____ # of motors DK R 2. _____ # of motors DK R 3. _____ # of motors DK R			

*Note average age if system contains different ages of equipment

Motor3. Process Motor Maintenance

Process Motor System	a. How often is maintenance performed? Refer to Maintenance Codes	b. Are any efficiency measures or practices in place? If Yes, describe:	c. Are NEMA premium efficiency motors installed?	d. When motors are replaced, are NEMA premium purchased?	e. Is motor/drive scheduling in place?
1. System #1	1. Maintenance Code: __	1. Y N DK R _____	1. Y N DK R	1. Y N DK R	1. Y N DK R
	2. Maintenance Code: __	2. Y N DK R _____	2. Y N DK R	2. Y N DK R	2. Y N DK R
	3. Maintenance Code: __	3. Y N DK R _____	3. Y N DK R	3. Y N DK R	3. Y N DK R
2. System # 2	1. Maintenance Code: __	1. Y N DK R _____	1. Y N DK R	1. Y N DK R	1. Y N DK R
	2. Maintenance Code: __	2. Y N DK R _____	2. Y N DK R	2. Y N DK R	2. Y N DK R
	3. Maintenance Code: __	3. Y N DK R _____	3. Y N DK R	3. Y N DK R	3. Y N DK R
3. System #3	1. Maintenance Code: __	1. Y N DK R _____	1. Y N DK R	1. Y N DK R	1. Y N DK R
	2. Maintenance Code: __	2. Y N DK R _____	2. Y N DK R	2. Y N DK R	2. Y N DK R
	3. Maintenance Code: __	3. Y N DK R _____	3. Y N DK R	3. Y N DK R	3. Y N DK R

Maintenance Codes
01: More than once a year
02: Annually
03: Every 2 years
04: More than 2 years to every 5 years
05: More than 5 years
06: As needed
07: Never
97: Don't know
98: Refused to answer

Motor4. Note if the following strategies were used to reduce energy use in the process motor systems?
[\[See Guidebook for examples of controls and measures\]](#)

Process Motor System	Strategy				
	a. Installation of Energy Efficient Drive Motor SIC Codes: All	b. Replace V Belts w/ cog V-belts SIC Codes: All	c. Improvements to Air Conveying Systems SIC Codes: 24, 25 24 –Lumber & Wood Products, 25 – Furniture & Fixtures	d. Installation of Gap Forming Paper machine SIC Codes: 26 Paper	e. Installation of High Consistency Forming SIC Codes: 26 Paper
1. System #1	1. App: Y N DK R	1. App: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R
	1. Inst: Y N DK R	1. Inst: Y N DK R			
	1. Feas: Y N DK R	1. Feas: Y N DK R			
	2. App: Y N DK R	2. App: Y N DK R			
	2. Inst: Y N DK R	2. Inst: Y N DK R			
	2. Feas: Y N DK R	2. Feas: Y N DK R			
	3. App: Y N DK R	3. App: Y N DK R			
	3. Inst: Y N DK R	3. Inst: Y N DK R			
	3. Feas: Y N DK R	3. Feas: Y N DK R			
2. System #2	1. App: Y N DK R	1. App: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R
	1. Inst: Y N DK R	1. Inst: Y N DK R			
	1. Feas: Y N DK R	1. Feas: Y N DK R			
	2. App: Y N DK R	2. App: Y N DK R			
	2. Inst: Y N DK R	2. Inst: Y N DK R			
	2. Feas: Y N DK R	2. Feas: Y N DK R			
	3. App: Y N DK R	3. App: Y N DK R			
	3. Inst: Y N DK R	3. Inst: Y N DK R			
	3. Feas: Y N DK R	3. Feas: Y N DK R			
3. System #3	1. App: Y N DK R	1. App: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R
	1. Inst: Y N DK R	1. Inst: Y N DK R			
	1. Feas: Y N DK R	1. Feas: Y N DK R			
	2. App: Y N DK R	2. App: Y N DK R			
	2. Inst: Y N DK R	2. Inst: Y N DK R			
	2. Feas: Y N DK R	2. Feas: Y N DK R			
	3. App: Y N DK R	3. App: Y N DK R			
	3. Inst: Y N DK R	3. Inst: Y N DK R			
	3. Feas: Y N DK R	3. Feas: Y N DK R			

Motor4. (Cont'd)

Note if the following strategies were used to reduce energy use in the process motor systems?

[See Guidebook for examples of controls and measures]

Process Motor System	Strategy					
	f. Optimization measures SIC Codes: All	g. Installation of Light Cylinders SIC Codes: 27 Printing & Publishing	h. Multipump extruders/ injection moulding SIC Codes: 30 Rubber/Plastics	i. Direct Drive Extruders SIC Codes: 30 Rubber/Plastics	j. Injection Molding- Impulse Cooling SIC Codes: 30 Rubber/Plastics	k. Injection Molding: Replace Hydraulic Drives with Electric Drive and VSD Controls SIC Codes: 30 Rubber/Plastics
1. System #1	App: Y N DK R	App: Y N DK R	App: Y N DK R	1. App: Y N DK R 1. Inst: Y N DK R 1. Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	1. App: Y N DK R 1. Inst: Y N DK R 1. Feas: Y N DK R
	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	2. App: Y N DK R 2. Inst: Y N DK R 2. Feas: Y N DK R		2. App: Y N DK R 2. Inst: Y N DK R 2. Feas: Y N DK R
	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	3. App: Y N DK R 3. Inst: Y N DK R 3. Feas: Y N DK R		3. App: Y N DK R 3. Inst: Y N DK R 3. Feas: Y N DK R
2. System #2	App: Y N DK R	App: Y N DK R	App: Y N DK R	1. App: Y N DK R 1. Inst: Y N DK R 1. Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	1. App: Y N DK R 1. Inst: Y N DK R 1. Feas: Y N DK R
	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	2. App: Y N DK R 2. Inst: Y N DK R 2. Feas: Y N DK R		2. App: Y N DK R 2. Inst: Y N DK R 2. Feas: Y N DK R
	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	3. App: Y N DK R 3. Inst: Y N DK R 3. Feas: Y N DK R		3. App: Y N DK R 3. Inst: Y N DK R 3. Feas: Y N DK R
3. System #3	App: Y N DK R	App: Y N DK R	App: Y N DK R	1. App: Y N DK R 1. Inst: Y N DK R 1. Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	1. App: Y N DK R 1. Inst: Y N DK R 1. Feas: Y N DK R
	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	2. App: Y N DK R 2. Inst: Y N DK R 2. Feas: Y N DK R		2. App: Y N DK R 2. Inst: Y N DK R 2. Feas: Y N DK R
	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	3. App: Y N DK R 3. Inst: Y N DK R 3. Feas: Y N DK R		3. App: Y N DK R 3. Inst: Y N DK R 3. Feas: Y N DK R

Motor4. (Cont'd)

Note if the following strategies were used to reduce energy use in the process motor systems?
[\[See Guidebook for examples of controls and measures\]](#)

Process Motor System	Strategy				
	l. Efficient Grinding SIC Codes: 32 Stone, Glass, Clay, Concrete	m. Efficient Drives for Rolling SIC Codes: 27 Printing & Publishing	n. High Efficiency Bakery Mixing SIC Codes: 20 Food & Kindred Products	o. Optimization of Spinning Machines SIC Codes: 22,23 22 - Textiles 23 – Clothing & Apparel	p. O and M of Spinning Machines SIC Codes: 22,23 22 - Textiles 23 – Clothing & Apparel
1. System #1	App: Y N DK R	1. App: Y N DK R 1. Inst: Y N DK R 1. Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R
	Inst: Y N DK R	2. App: Y N DK R 2. Inst: Y N DK R 2. Feas: Y N DK R			
	Feas: Y N DK R	3. App: Y N DK R 3. Inst: Y N DK R 3. Feas: Y N DK R			
2. System #2	App: Y N DK R	1. App: Y N DK R 1. Inst: Y N DK R 1. Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R
	Inst: Y N DK R	2. App: Y N DK R 2. Inst: Y N DK R 2. Feas: Y N DK R			
	Feas: Y N DK R	3. App: Y N DK R 3. Inst: Y N DK R 3. Feas: Y N DK R			
3. System #3	App: Y N DK R	1. App: Y N DK R 1. Inst: Y N DK R 1. Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R
	Inst: Y N DK R	2. App: Y N DK R 2. Inst: Y N DK R 2. Feas: Y N DK R			
	Feas: Y N DK R	3. App: Y N DK R 3. Inst: Y N DK R 3. Feas: Y N DK R			

Motor5. Does the facility have a printing press?

1. <input type="checkbox"/> Yes	
2. <input type="checkbox"/> No	Skip to Next Section
97. <input type="checkbox"/> Don't know	Skip to Next Section
98. <input type="checkbox"/> Refused to answer	Skip to Next Section

Motor5a. [\[If Motor5 = Yes\]](#) Are efficient practices in place?

1. <input type="checkbox"/> Yes	
2. <input type="checkbox"/> No	Skip to Next Section
97. <input type="checkbox"/> Don't know	Skip to Next Section
98. <input type="checkbox"/> Refused to answer	Skip to Next Section

Motor5b. [\[If Motor5 = Yes\]](#) Is the printing press efficient (i.e. has fewer cylinders)?

1. <input type="checkbox"/> Yes
2. <input type="checkbox"/> No
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

PROCESS BOILER SYSTEMS

Boil1. Is there a process heat boiler system at this facility?

1. <input type="checkbox"/> Yes	
2. <input type="checkbox"/> No	Skip to Next Section
97. <input type="checkbox"/> Don't know	Skip to Next Section
98. <input type="checkbox"/> Refused to answer	Skip to Next Section

Boil2. Process Boiler Characteristics and Maintenance

Process Boiler Characteristics and Maintenance	1. System #1 Describe System Use _____	2. System #2 Describe System Use _____	3. System #3 Describe System Use _____
a. Age of system <i>*Note average age if system contains different ages of equipment</i>	_____ # of years DK R	_____ # of years DK R	_____ # of years DK R
b. How many boilers are in this system?	_____ # of boilers DK R	_____ # of boilers DK R	_____ # of boilers DK R
c. Fuel Used Refer to Fuel Codes If Code=04, describe:	Fuel Code: _ _ DK R _____	Fuel Code: _ _ DK R _____	Fuel Code: _ _ DK R _____
d. System Capacity	_____ kW MMBTU DK R	_____ kW MMBTU DK R	_____ kW MMBTU DK R
e. % of boiler load	__ __ % DK R	__ __ % DK R	__ __ % DK R
f. How often is maintenance performed? Refer to Maintenance Codes	Maintenance Code: DK R	Maintenance Code: DK R	Maintenance Code: DK R
g. Is insulation installed on the distribution pipes?	Y N DK R	Y N DK R	Y N DK R
h. Are there leaks in the system that need to be repaired	Y N DK R	Y N DK R	Y N DK R

Fuel Codes
01: Electricity
02: Natural Gas
03: #2 Fuel Oil
04: Other (Describe)
97: Don't know
98: Refused to answer
Maintenance Codes
01: More than once a year
02: Annually
03: Every 2 years
04: More than 2 years to every 5 years
05: More than 5 years
06: As needed
07: Never
97: Don't know
98: Refused to answer

Boil3. Note if the following strategies were used to reduce energy use in the process boiler systems
[\[See Guidebook for examples of controls and measures\]](#)

Process Boiler System	Strategy			
	a. Flue gas heat recovery/ economizer	b. Blowdown steam heat recovery	c. Water Treatment practices	d. Thermally Activated heat pump/chiller
1. System #1	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R
	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R
	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R
2. System # 2	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R
	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R
	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R
3. System #3	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R
	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R
	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R

Process Boiler System	Strategy			
	e. Automatic steam trap monitoring system	f. Improved Process Control	g. Condensate Return	h. Load Control Practices
1. System #1	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R
	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R
	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R
2. System # 2	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R
	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R
	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R
3. System #3	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R
	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R
	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R

PROCESS HEATING

Heat1. Is there process heating at this facility?

1. <input type="checkbox"/> Yes	
2. <input type="checkbox"/> No	Skip to Next Section
97. <input type="checkbox"/> Don't know	Skip to Next Section
98. <input type="checkbox"/> Refused to answer	Skip to Next Section

Heat2. Process Heating Characteristics and Maintenance

Process Heating System Describe System Use	a. Age of system*	b. How often is maintenance performed? Refer to Maintenance Codes	c. Fuel Used Refer to Fuel Codes If Code=06, describe:	d. Are any efficiency measures or practices in place? If Yes, describe:
1. System #1 _____	_____ # of years DK R	Maintenance Code: ____	Fuel Code: __ DK R	Y N DK R _____
2. System # 2 _____	_____ # of years DK R	Maintenance Code: ____	Fuel Code: __ DK R	Y N DK R _____
3. System #3 _____	_____ # of years DK R	Maintenance Code: ____	Fuel Code: __ DK R	Y N DK R _____

*Note average age if system contains different ages of equipment

Process Heating System Describe System Use	e. Are process controls installed on the system?	f. Is insulation installed to reduce heating losses in the system?	g. Is scheduling implemented for this system?	h. Are any other controls installed on this system?
1. System #1	Y N DK R	Y N DK R	Y N DK R	Y N DK R
2. System # 2	Y N DK R	Y N DK R	Y N DK R	Y N DK R
3. System #3	Y N DK R	Y N DK R	Y N DK R	Y N DK R

Maintenance Codes
01: More than once a year
02: Annually
03: Every 2 years
04: More than 2 years to every 5 years
05: More than 5 years
06: As needed
07: Never
97: Don't know
98: Refused to answer

Fuel Codes
01: Electricity
02: Natural Gas
03: Oil
04: Kerosene
05: Bottled Gas or Propane
06: Other (Describe)
97: Don't know
98: Refused to answer

Heat3. Note if the following strategies were used to reduce energy use in the process heating systems?
[\[See Guidebook for examples of controls and measures\]](#)

Process Heating System	Strategy				
	a. Heat pumps for drying SIC Codes: 24, 25 24 – Lumber & Wood Products, 25 – Furniture & Fixtures	b. Efficient electric melting system SIC Codes: 33 Primary Metal Industries	c. Efficient Curing Ovens SIC Codes: 34, 35, 36, 37, 38 34 – Fabricated metal products, 35 – Industrial machinery & equipment, 36 – Electrical & electronic equipment, 37 – Transportation equipment, 38 – Instruments and related products	d. Top-heating (glass) SIC Codes: 32 Stone, Clay, Glass, & Concrete Products	e. Efficient Burners SIC Codes: 32, 33, 34 32 – Stone, Clay, Glass, & Concrete Products 33 – Primary Metal Industries 34 – Fabricated metal products
1. System #1	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R
	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R
	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R
2. System # 2	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R
	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R
	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R
3. System #3	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R
	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R
	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R

Process Heating System	Strategy				
	f. Heat Recovery System SIC Codes: All	g. Process Integration SIC Codes: 20, 26, 28, 29 20 – Food & kindred products 26 – Paper and allied products, 28 – Chemicals and allied products 29 – Petroleum and coal products	h. Efficient Drying Practices SIC Codes: 20 Food & kindred products	i. Improved Separation Process SIC Codes: 28 Chemicals and allied products	j. Flare Gas Controls and Recovery SIC Codes: 29 Petroleum and coal products
1. System #1	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R
	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R
	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R
2. System # 2	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R
	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R
	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R
3. System #3	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R
	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R
	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R

Heat3. (Cont'd)

Note if the following strategies were used to reduce energy use in the process heating systems?

[See Guidebook for examples of controls and measures]

Process Heating System	Strategy				
	k. Fouling Control SIC Codes: 29 Petroleum and coal products	l. Efficiency improvements to Furnaces SIC Codes: 29 Petroleum and coal products	m. Oxyfuel furnaces SIC Codes: 32 Stone, Clay, Glass, & Concrete Products	n. Combustion Controls SIC Codes: 34 Fabricated metal products	o. Optimization of Furnace Operations SIC Codes: 34 Fabricated metal products
1. System #1	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R
	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R
	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R
2. System # 2	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R
	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R
	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R
3. System #3	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R
	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R
	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R

REFRIGERATION / PROCESS COOLING

Ref1. Is there refrigeration / process cooling at this facility?

1. <input type="checkbox"/> Yes	
2. <input type="checkbox"/> No	Skip to Next Section
97. <input type="checkbox"/> Don't know	Skip to Next Section
98. <input type="checkbox"/> Refused to answer	Skip to Next Section

Ref2. Refrigeration / Process Cooling Characteristics and Maintenance

Refrigeration/ Process Cooling System	a. Age of system*	b. What type of refrigerant? [Circle one]	c1. Type of Equipment Refer to Equipment Codes If Code=09, describe:	c2. Equipment Use Refer to Equipment Use Codes If Code=04, describe:	d. Fuel Used Refer to Fuel Codes If Code=03, describe:
1. System #1	_____ # of years DK R	Freon Ammonia Other: _____	Refrigeration Equipment Code: ____	Equipment Use Code: ____	Fuel Code: ____
2. System # 2	_____ # of years DK R	Freon Ammonia Other: _____	Refrigeration Equipment Code: ____	Equipment Use Code: ____	Fuel Code: ____
3. System #3	_____ # of years DK R	Freon Ammonia Other: _____	Refrigeration Equipment Code: ____	Equipment Use Code: ____	Fuel Code: ____

*Note average age if system contains different ages of equipment

Equipment Codes
01: Blast/Flash Freezers
02: Refrigerated Warehouse
03: Freezer Warehouse
04: Process Equipment Cooled by Chilled Water
05: Equipment to Make Ice for Skating
06: Refrigerated Walk in/Prep Area (30 to 40°F)
07: Freezer Walk in/Prep Area (0 to -10°F)
08: Chilled Prep Area (50 to 55°F)
09: Other cooling equipment (Describe)
97: Don't know
98: Refused to answer
Equipment Use Codes
01: Water-cooled Chiller
02: Air-cooled Chiller
03: District chilled water piped in from outside the building
04: Other (Describe)
97: Don't know
98: Refused to answer
Fuel Codes
01: Electricity
02: Natural Gas
03: Other (Describe)
97: Don't know
98: Refused to answer

Refrigeration/ Process Cooling System	Note: Fill in e OR f		g. How often is maintenance performed? Refer to Maintenance Codes	h. Are any efficiency measures or practices in place? If Yes, describe
	e. Size in sq ft	f. # of units		
1. System #1	_____ Sq ft DK R	_____ # of units DK R	Maintenance Code: ____	Y N DK R _____
2. System # 2	_____ Sq ft DK R	_____ # of units DK R	Maintenance Code: ____	Y N DK R _____
3. System #3	_____ Sq ft DK R	_____ # of units DK R	Maintenance Code: ____	Y N DK R _____

Maintenance Codes
01: More than once a year
02: Annually
03: Every 2 years
04: More than 2 years to every 5 years
05: More than 5 years
06: As needed
07: Never
97: Don't know
98: Refused to answer

Ref3. Note if the following strategies were used to reduce energy use in the refrigeration/process cooling systems.
[\[See Guidebook for examples of controls and measures\]](#)

Refrigeration/ Process Cooling System	Strategy				
	a. Water-cooled condenser	b. Electronically Commutated Motors (ECM)	c. Evaporator fan controller for walk- ins	d. Efficient compressor	e. Heat recovery
1. System #1	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R
2. System # 2	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R
3. System #3	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R

Refrigeration/ Process Cooling System	f. Compressor VSDs	g. Floating head pressure controls	h. Demand hot gas defrost (uses sensor to detect when defrost is needed - automatic)	i. Demand electric defrost (uses sensor to detect when defrost is needed - automatic)	j. Anti-sweat (humidistat) controls
1. System #1	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R
2. System # 2	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R
3. System #3	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R

Ref3. (Cont'd)

Note if the following strategies were used to reduce energy use in the refrigeration/process cooling systems.

[See Guidebook for examples of controls and measures]

Refrigeration/ Process Cooling System	k. Multiplex compressors	l. Condenser fan VSD	m. LED lighting	n. Air curtains
1. System #1	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R
2. System # 2	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R
3. System #3	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R

Refrigeration/ Process Cooling System	Strategy			
	o. Door closers on walk-ins	p. Door closers on cases	q. Zero Energy Freezer Doors	r. Strip curtains for walk-ins
1. System #1	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R
2. System # 2	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R
3. System #3	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R

Ref3. (Cont'd)

Note if the following strategies were used to reduce energy use in the refrigeration/process cooling systems.

[See Guidebook for examples of controls and measures]

Refrigeration/ Process Cooling System	s. High Efficiency Centrifugal Chiller (0.51kW/ton)	t. Cooling Circulation Pumps with Variable Speed Drives	u. Convert to water- cooled chiller	v. Premium efficiency pump motors
1. System #1	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R
2. System # 2	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R
3. System #3	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R

Refrigeration/ Process Cooling System	Strategy			
	w. VSD for cooling tower fans	x. Oversized cooling towers	y. Economizers, air-side	z. Economizers, water-side
1. System #1	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R
2. System # 2	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R
3. System #3	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R

SPACE COOLING

Cool1. Is there space cooling at this facility?

1. <input type="checkbox"/> Yes	
2. <input type="checkbox"/> No	Skip to Next Section
97. <input type="checkbox"/> Don't know	Skip to Next Section
98. <input type="checkbox"/> Refused to answer	Skip to Next Section

Cool2. Space Cooling Characteristics

Space Cooling System	a. Age of system*	b. Type of equipment Refer to Cooling Equipment Codes If Code=10, describe:	c. % of cooling load supplied	d. System Capacity [Tons]
1. System #1	_____ # of years DK R	Cooling Equipment Code: __ __ _____	_____% DK R	_____ Tons DK R
2. System # 2	_____ # of years DK R	Cooling Equipment Code: __ __ _____	_____% DK R	_____ Tons DK R
3. System #3	_____ # of years DK R	Cooling Equipment Code: __ __ _____	_____% DK R	_____ Tons DK R

*Note average age if system contains different ages of equipment

Cooling Equipment Codes
01: Water-cooled Chiller
02: Air-cooled Chiller
03: Packaged heat pumps for cooling
04: Rooftop or packaged AC units, (also known as DX or direct expansion units)
05: DX Split Systems
06: Absorption gas or steam (absorption chillers or heat pumps)
07: Packaged Terminal Air Conditioner (PTAC) System (Individual room heater)
08: Individual room air conditioners, other than heat pumps
09: District chilled water piped in from outside the building
10: Other cooling equipment (Describe)
97: Don't know
98: Refused to answer

Space Cooling System	e. Fuel Used Refer to Fuel Codes If Code=03, describe:	f. How often is maintenance performed? Refer to Maintenance Codes	g. How many months per year does this system run?	h. How many hours per day does this system run when on?
1. System #1	Fuel Code: __ __ _____	Maintenance Code: __ __ _____	_____ # of months DK R	_____ # of hours DK R
2. System # 2	Fuel Code: __ __ _____	Maintenance Code: __ __ _____	_____ # of months DK R	_____ # of hours DK R
3. System #3	Fuel Code: __ __ _____	Maintenance Code: __ __ _____	_____ # of months DK R	_____ # of hours DK R

Fuel Codes
01: Electricity
02: Natural Gas
03: Other (Describe)
97: Don't know
98: Refused to answer
Maintenance Codes
01: More than once a year
02: Annually
03: Every 2 years
04: More than 2 years to every 5 years
05: More than 5 years
06: As needed
07: Never
97: Don't know
98: Refused to answer
Note: Hours represent # of hours that the system is in <u>active</u> heating mode versus setback mode, but not the actual run time of the equipment.

Cool3. Note if the following strategies were used to reduce energy use in the space cooling systems
[\[See Guidebook for examples of controls and measures\]](#)

Space Cooling System	Strategy				
	a. High-efficiency DX packaged system (10.9 EER)	b. High Efficiency Centrifugal Chiller (0.51kW/ton)	c. Window Film	d. EMS System Installed	e. Cooling Circulation Pumps with Variable Speed Drives
1. System #1	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R
2. System # 2	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R
3. System #3	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R

Space Cooling System	Strategy				
	f. Programmable Thermostat	g. Convert to water-cooled chiller	h. Premium efficiency pump motors	i. VSD for cooling tower fans	j. Oversized cooling towers
1. System #1	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R
2. System # 2	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R
3. System #3	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R

Cool3.

(Cont'd)

Note if the following strategies were used to reduce energy use in the space cooling systems

[See Guidebook for examples of controls and measures]

Space Cooling System	Strategy			
	k. Economizers, air-side	l. Economizers, water-side	m. Hydronic variable flow (Water loop heat pumps)	n. Primary/secondary chilled water loops
1. System #1	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R
2. System # 2	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R
3. System #3	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R

Space Cooling System	Strategy			
	o. Duct sealing (applicable only to unconditioned spaces)	p. Duct insulation (applicable only to unconditioned spaces)	q. Cool Roof	r. Ductless (Mini split) Cooling System
1. System #1	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R
2. System # 2	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R
3. System #3	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R	App: Y N DK R Inst: Y N DK R Feas: Y N DK R

SPACE HEATING

SpaceHeat1. Is there a space heating system at this facility?

1. <input type="checkbox"/> Yes	
2. <input type="checkbox"/> No	Skip to Next Section
97. <input type="checkbox"/> Don't know	Skip to Next Section
98. <input type="checkbox"/> Refused to answer	Skip to Next Section

SpaceHeat2. Space Heating Characteristics

Space Heating System	a. Age of system*	b. Type of equipment Refer to Heating Equipment Codes If Code=08, describe	c. System Capacity Check unit of measurement: MMBTU or kW	d. % of space heating load by capacity
1. System #1	_____ # of years DK R	Heating Code:_____ _____	<input type="checkbox"/> MMBTU <input type="checkbox"/> kW DK R	_____% DK R
2. System # 2	_____ # of years DK R	Heating Code:_____ _____	<input type="checkbox"/> MMBTU <input type="checkbox"/> kW DK R	_____% DK R
3. System #3	_____ # of years DK R	Heating Code:_____ _____	<input type="checkbox"/> MMBTU <input type="checkbox"/> kW DK R	_____% DK R

*Note average age if system contains different ages of equipment

Space Heating System	e. Fuel Used Refer to Fuel Codes If Code=09, describe	f. How often is maintenance performed? Refer to Maintenance Codes	g. How many months per year does this system run?	h. About how many hours is the heating system running each day it is used? Refer to Heating Hours Codes
1. System #1	Fuel Code:_____ _____	Maintenance Code:_____ _____	_____ # of months DK R	Heating Hours Code:_____ _____
2. System # 2	Fuel Code:_____ _____	Maintenance Code:_____ _____	_____ # of months DK R	Heating Hours Code:_____ _____
3. System #3	Fuel Code:_____ _____	Maintenance Code:_____ _____	_____ # of months DK R	Heating Hours Code:_____ _____

Heating Equipment Codes

01: Furnaces that heat air directly, without using steam or water
 02: Boilers inside the building that produce steam or hot water
 03: Packaged heat pumps
 04: Split heat pump system
 05: Rooftop or packaged heating units, other than heat pumps
 06: Individual space heaters, other than heat pumps
 07: District steam or hot water piped in from outside the building
 08: Other heating equipment
(Describe)
 97: Don't know
 98: Refused to answer

Fuel Codes

01: Electricity
 02: Natural Gas
 03: Oil
 04: Kerosene
 05: Bottled Gas or Propane
 06: Wood
 07: Coal
 08: Solar
 09: Other **(Describe)**
 97: Don't know
 98: Refused to answer

Maintenance Codes

01: More than once a year
 02: Annually
 03: Every 2 years
 04: More than 2 years to every 5 years
 05: More than 5 years
 06: As needed
 07: Never
 97: Don't know
 98: Refused to answer

Heating Hours Codes

01: Less than 4 hours
 02: More than 4 hours to 8 hours
 03: More than 8 hours to 12 hours
 04: More than 12 hours to 16 hours
 05: More than 16 hours to 20 hours
 06: More than 20 hours
 07: Run continuously
 97: Don't know
 98: Refused to answer
Note: Hours represent # of hours that the system is in active heating mode versus setback mode, but not the actual run time of the equipment.

SpaceHeat3. Note if the following strategies were used to reduce energy use in the HVAC systems

[\[See Guidebook for examples of controls and measures\]](#)

Space Heating System	Strategy			
	a. High Efficiency Condensing Furnace or Boiler	b. Stack Heat Exchanger	c. Installation of EMS	d. EMS Optimization
1. System #1	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R
	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R
	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R
2. System # 2	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R
	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R
	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R
3. System #3	App: Y N DK R	App: Y N DK R	App: Y N DK R	App: Y N DK R
	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R	Inst: Y N DK R
	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R	Feas: Y N DK R

LIGHTING

Light1. End Use Information

<u>LIGHTING TYPE</u>	1. T5 Fixtures (<4 foot fixtures; 1 or 2 lamps)	2. Standard T8 Fixtures (4 foot fixtures; 1 or 2 lamps)
Total # of Fluorescent Fixtures (4ft 1 or 2 lamps)	Enter #: _____ DK R	Enter #: _____ DK R
a. % Fixtures with Reflectors	_____% DK R	_____% DK R
b. % Under Control of Occupancy Sensors	_____% DK R	_____% DK R
c1. % Under Control of Daylight Sensors	% Daylight Control: ____% DK R	% Daylight Control: ____% DK R
c2. %Feasible?	% Feasible: ____% DK R	% Feasible: ____% DK R

<u>LIGHTING TYPE</u>	3. High Perf. T8 Fixtures (4 foot fixtures; 1 or 2 lamps)	4. T12 Fixtures (4 foot fixtures; 1 or 2 lamps)
Total # of Fluorescent Fixtures (4ft 1 or 2 lamps)	Enter #: _____ DK R	Enter #: _____ DK R
a. % Fixtures with Reflectors	_____% DK R	_____% DK R
b. % Under Control of Occupancy Sensors	_____% DK R	_____% DK R
c1. % Under Control of Daylight Sensors	% Daylight Control: ____% DK R	% Daylight Control: ____% DK R
c2. %Feasible?	% Feasible: ____% DK R	% Feasible: ____% DK R

<u>LIGHTING TYPE</u>	5. T5 Fixtures (<4 foot fixtures; 3 or more lamps)	6. Standard T8 Fixtures (4 foot fixtures; 3 or more lamps)
Total # of Fluorescent Fixtures (4ft - 3 or more lamps)	Enter #: _____ DK R	Enter #: _____ DK R
a. % Fixtures with Reflectors	_____% DK R	_____% DK R
b. % Under Control of Occupancy Sensors	_____% DK R	_____% DK R
c1. % Under Control of Daylight Sensors	% Daylight Control: ____% DK R	% Daylight Control: ____% DK R
c2. %Feasible?	% Feasible: ____% DK R	% Feasible: ____% DK R

Light1. (Cont'd)

End Use Information

<u>LIGHTING TYPE</u>	7. High Perf. T8 Fixtures (4 foot fixtures; 3 or more lamps)	8. T12 Fixtures (4 foot fixtures; 3 or more lamps)
Total # of Fluorescent Fixtures (4ft - 3 or more lamps)	Enter #: _____ DK R	Enter #: _____ DK R
a. % Fixtures with Reflectors	_____% DK R	_____% DK R
b. % Under Control of Occupancy Sensors	_____% DK R	_____% DK R
c1. % Under Control of Daylight Sensors	% Daylight Control: ____% DK R	% Daylight Control: ____% DK R
c2. %Feasible?	% Feasible: ____% DK R	% Feasible: ____% DK R

<u>LIGHTING TYPE</u>	9. Standard T8 Fixtures (8foot fixtures; Any # of lamps)	10. High Perf. T8 Fixtures (8foot fixtures; Any # of lamps)	11. T12 Fixtures (8foot fixtures; Any # of lamps)
Total # of Fluorescent Fixtures (5ft or longer-Any # of lamps)	Enter #: _____ DK R	Enter #: _____ DK R	Enter #: _____ DK R
a. % Fixtures with Reflectors	_____% DK R	_____% DK R	_____% DK R
b. % Under Control of Occupancy Sensors	_____% DK R	_____% DK R	_____% DK R
c1. % Under Control of Daylight Sensors	% Daylight Control: ____% DK R	% Daylight Control: ____% DK R	% Daylight Control: ____% DK R
c2. %Feasible	% Feasible: ____% DK R	% Feasible: ____% DK R	% Feasible: ____% DK R

% of Building Square Footage Illuminated by any type of Tube Fluorescent [no CFL's here]	_____% DK R
---	-----------------------

Light2. (Cont'd)
Lighting Information

13. Incandescents/CFLs	
a. Total # of Incandescents	Enter #: _____ DK R
b. Total # of CFLs (Refers to <u>ALL</u> types of CFLs)	Enter # of CFLs: _____ DK R
c. % of CFLs	Enter % Screw-in CFL: _ _ _ DK R
	Enter % Hardwired CFL: _ _ _ DK R
d. % of Incandescent Fixtures Feasible for <u>Hardwired</u> CFL's	_ _ _ % DK R

High Intensity Discharge (HID) Lamps	14. Total # of Metal Halide	15. Total # of Pulse-Start Metal Halide	16. Total # of High Pressure Sodium	17. Total # of Mercury Vapor
a. Total # of lamps	Enter #: _____ DK R	Enter #: _____ DK R	Enter #: _____ DK R	Enter #: _____ DK R
b. % w/ Hi/Low or Bi-Level Control	_ _ _ % DK R	_ _ _ % DK R	_ _ _ % DK R	_ _ _ % DK R
c. % Hi/Low or Bi-Level Control Feasible	_ _ _ % DK R	_ _ _ % DK R	_ _ _ % DK R	_ _ _ % DK R

Light3. Have you replaced high intensity discharge indoor lighting, such as high bay metal halide fixtures, with T5 or T8 fluorescent lighting?

1. <input type="checkbox"/> Yes (What percent: _ _ _ %) DK R
2. <input type="checkbox"/> No
97. <input type="checkbox"/> Don't know
98. <input type="checkbox"/> Refused to answer

Light4. Lighting System Maintenance

Lighting System	a. How often is maintenance performed? Refer to Maintenance Codes	b. How often is the control strategy revisited? Refer to Strategy Codes	c. Last time a major upgrade was performed on the lighting system?
Complete Lighting System	Maintenance Code#: — —	Strategy Code: — —	____ Years DK R

***Lighting Controls Tune-Up**

Periodically, lighting controls need to be calibrated. Photocell sensors may fall into disrepair over time, occupancy sensor control settings may not be configured to result in maximum energy savings, and timeclock controls may not result in sufficient precision. Some buildings may also have light sweeping controls and load shedding dimmer controls for demand reduction that should be tuned up. Spaces can be under-lit as a result of dirty fixtures which should be cleaned as part of a tune up.

Maintenance Codes
01: More than once a year
02: Annually
03: Every 2 years
04: More than 2 years to every 5 years
05: More than 5 years
06: As needed
07: Never
97: Don't know
98: Refused to answer

Strategy Codes
01: More than once a year
02: Annually
03: Every 2 years
04: More than 2 years to every 5 years
05: More than 5 years
06: As needed
97: Don't know
98: Refused to answer

Fixture Counts Work Space – For Surveyor

OTHER PROCESSES

OP1. Are there other processes performed at this facility?

1. <input type="checkbox"/> Yes	
2. <input type="checkbox"/> No	Thank and Terminate Survey
97. <input type="checkbox"/> Don't know	Thank and Terminate Survey
98. <input type="checkbox"/> Refused to answer	Thank and Terminate Survey

OP2. Other Processes

Other Processes	a. Describe the other processes performed by this system	b. Fuel Used Refer to Fuel Codes If Code=03, describe:	c. How often is maintenance performed? Refer to Maintenance Codes	d. Have you implemented any efficient practices for this system in the past five years? If Yes, describe:
1. System #1	_____ DK R	Fuel Code: __ __ _____	Maintenance Code: __ __	Y N DK R _____
2. System # 2	_____ DK R	Fuel Code: __ __ _____	Maintenance Code: __ __	Y N DK R _____
3. System #3	_____ DK R	Fuel Code: __ __ _____	Maintenance Code: __ __	Y N DK R _____

Fuel Codes
01: Electricity
02: Natural Gas
03: Other (Describe)
97: Don't know
98: Refused to answer

Maintenance Codes
01: More than once a year
02: Annually
03: Every 2 years
04: More than 2 years to every 5 years
05: More than 5 years
06: As needed
07: Never
97: Don't know
98: Refused to answer

[illegible]



Rhode Island Energy Efficiency and Resources Management Council (EERMC) – Achievable Potential.

Appendix H.



Prepared by KEMA, Inc.

Burlington, Massachusetts, August 26, 2010

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Table of Contents

1. Achievable Potential	1-1
2. Residential Existing Programs	2-1
3. Commercial Existing Programs	3-1
4. Industrial Existing Programs	4-1
4.1 Commercial Behavioral	4-3
4.2 Residential Behavioral	4-5
4.3 Commercial Behavioral	4-7
4.4 Industrial Behavioral	4-8
4.5 New Technologies	4-9

List of Exhibits:

Table 1 Residential Existing Programs	2-2
Table 2 Existing Commercial Programs	3-2
Table 3 Industrial Existing Programs	4-2
Table 4 Commercial Price Response	4-4
Table 5 Residential Behavioral	4-6
Table 6 Commercial Behavioral	4-7
Table 7 Industrial Behavioral	4-8
Table 8 New Technologies	4-10

1. Achievable Potential

This appendix presents the Achievable potential runs. This includes energy and demand savings estimates, cost estimates, benefit estimates and benefit cost ratios. These results are presented for:

- Existing Residential Programs
- Existing Commercial Programs
- Existing Industrial Programs
- Commercial Price Response
- Residential Behavioral
- Commercial Behavioral
- Industrial Behavioral
- New Technologies

2. Residential Existing Programs

We modeled the following existing National Grid Programs in Rhode Island:

- Energy Wise
- Low Income – Single Family
- Lighting
- New Construction – Energy Star Homes
- Energy Star Central Air Conditioning
- Energy Star Heating
- Energy Star Appliances (includes Appliance Recycling)

These were modeled by market rather than exactly match the existing program configuration.

We modeled them as:

- Retrofit
- New Construction
- Lighting
- Replace on Burnout
- Appliance Recycling
- Low Income

Table 1 presents the overall results for the existing programs. As this table indicates, the new net savings decline over time. CFLs as a measure are phased out over time and are replaced by LEDs.

Table 1
Residential Existing Programs

Residential	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Net Energy Savings - kWh	57,448,250	127,283,030	192,951,660	252,199,818	309,718,366	352,098,994	392,798,928	428,768,157	453,794,482	475,204,083
Net Peak Demand Savings - kW	10,009	22,707	35,711	49,398	62,150	74,882	87,995	99,692	108,816	116,575
New Net Energy Savings - kWh	57,448,250	69,834,780	65,668,630	59,248,158	57,518,549	42,380,627	40,699,934	35,969,229	25,026,326	21,409,601
New Net Peak Demand Savings - kW	10,009	12,698	13,004	13,686	12,752	12,733	13,113	11,697	9,123	7,759
TRC	3.20									
Free Riders - kWh	13,351,932	25,425,610	36,050,334	36,185,643	36,321,220	36,456,618	36,590,970	36,723,311	36,854,101	36,983,472
Free Riders - kW	1,362	2,592	3,674	3,693	3,711	3,727	3,742	3,754	3,766	3,776
Other Naturally Occurring - kWh	43,328,987	82,926,852	118,280,111	122,238,943	126,210,993	130,218,500	134,026,961	137,764,666	141,392,927	144,959,195
Other Naturally Occurring - kW	4,746	9,109	13,041	13,794	14,548	15,306	16,023	16,694	17,337	17,966
Gross Energy - kWh	70,800,182	152,708,640	229,001,993	288,385,460	346,039,586	388,555,611	429,389,897	465,491,468	444,294,663	465,833,635
Gross Peak Demand - kW	11,371	25,299	39,386	53,091	65,860	78,609	91,737	103,447	107,290	115,059

3. Commercial Existing Programs

We modeled the following existing National Grid Programs in Rhode Island:

- Energy Initiative
- Design 2000 New Construction
- Small Commercial Direct Install

These were modeled by market rather than exactly match the existing program configuration.

We modeled them as:

- Retrofit
- New Construction
- Lighting
- Replace on Burnout

Table 2 presents the overall results for the existing programs. As this table indicates, the new net savings decline over time. CFLs as a measure are phased out over time and are replaced by LEDs.

Table 2
Existing Commercial Programs

Commercial	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Net Energy Savings - kWh	56,790,291	122,497,105	191,842,586	259,737,391	323,904,605	382,781,234	436,444,765	485,396,782	530,204,734	571,604,278
Net Peak Demand Savings - kW	10,046	21,574	33,916	46,383	58,546	70,065	80,897	91,065	100,614	109,621
New Net Energy Savings - kWh	56,790,291	65,706,814	69,345,481	67,894,805	64,167,214	58,876,629	53,663,531	48,952,017	44,807,952	41,399,544
New Net Peak Demand Savings - kW	10,046	11,528	12,341	12,467	12,163	11,519	10,832	10,169	9,549	9,007
PV Net Avoided Cost Benefits	\$126,876,039	\$142,174,104	\$145,572,276	\$141,943,883	\$134,094,466	\$123,368,908	\$112,979,311	\$103,575,084	\$95,309,164	\$88,561,381
PV Annual Program Marketing and Admin Costs	\$3,126,680	\$3,225,752	\$3,280,877	\$4,352,301	\$3,644,303	\$3,597,929	\$3,547,175	\$3,494,410	\$3,441,723	\$3,390,484
PV Net Measure Costs	\$16,565,737	\$19,485,412	\$21,312,676	\$22,242,708	\$21,969,369	\$21,177,531	\$20,157,729	\$19,023,285	\$17,855,050	\$16,711,772
TRC	5.24									
Free Riders - kWh	21,719,075	42,457,298	62,449,242	78,630,017	93,750,840	107,757,859	120,654,299	132,493,751	143,361,214	153,358,726
Free Riders - kW	3,224	6,268	9,211	11,525	13,709	15,757	17,672	19,458	21,126	22,688
Other Naturally Occurring - kWh	2,961,459	6,123,681	9,432,012	12,837,797	16,189,886	19,538,481	22,829,007	26,059,869	29,098,879	32,031,584
Other Naturally Occurring - kW	361	748	1,154	1,573	1,985	2,398	2,804	3,203	3,578	3,940
Gross Energy - kWh	78,509,366	164,954,403	254,291,828	338,367,408	417,655,446	490,539,094	557,099,064	617,890,533	673,565,948	724,963,004
Gross Peak Demand - kW	13,270	27,842	43,127	57,907	72,254	85,822	98,568	110,523	121,740	132,309

4. Industrial Existing Programs

We modeled the following existing National Grid Programs in Rhode Island:

- Energy Initiative

These were modeled by market rather than exactly match the existing program configuration. We modeled them as:

- Retrofit
- Replace on Burnout

Table 3 presents the overall results for the existing programs. As this table indicates, the new net savings decline over time.

Table 3
Industrial Existing Programs

Industrial	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Net Energy Savings - kWh	10,784,738	22,230,719	33,379,276	43,628,582	52,728,954	60,655,458	67,530,833	73,545,123	78,859,274	81,744,376
Net Peak Demand Savings - kW	1,673	3,446	5,174	6,766	8,183	9,421	10,498	11,441	12,266	12,726
New Net Energy Savings - kWh	10,784,738	11,445,982	11,148,557	10,249,306	9,100,372	7,926,504	6,875,375	6,014,290	5,314,150	2,885,103
New Net Peak Demand Savings - kW	1,673	1,773	1,728	1,592	1,417	1,239	1,077	942	825	460
TRC	3.99									
Free Riders - kWh	3,637,263	6,877,897	9,757,032	12,308,778	14,563,020	16,546,394	18,290,016	19,822,456	21,169,257	22,353,065
Free Riders - kW	528	999	1,418	1,789	2,117	2,403	2,653	2,873	3,065	3,235
Other Naturally Occurring - kWh	0	0	0	0	0	0	0	0	0	0
Other Naturally Occurring - kW	0	0	0	0	0	0	0	0	0	0
Gross Energy - kWh	14,422,001	29,108,616	43,136,307	55,937,360	67,291,974	77,201,851	85,820,849	93,367,580	100,028,531	87,773,455
Gross Peak Demand - kW	2,202	4,445	6,592	8,555	10,300	11,825	13,152	14,313	15,331	13,485

4.1 Commercial Behavioral

We assume this program used a display device and software to give customers the ability to respond to some form of time varying pricing. We assumed \$500 for the software/ display and initially \$75000 of administrative costs. We assumed no customer incentives. Customers were assumed to save up to 3% of usage over time.

Table 4
Commercial Price Response

Price response - commercial	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Net Energy Savings - kWh	0	0	0	0	4,067,283	16,456,073	37,419,266	58,693,295	80,253,190	106,463,357
Net Peak Demand Savings - kW	0	0	0	0	910	2,730	6,374	10,476	14,124	18,689
New Net Energy Savings - kWh	0	0	0	0	4,067,283	12,388,790	20,963,193	21,274,029	21,559,895	26,210,167
New Net Peak Demand Savings - kW	0	0	0	0	910	1,821	3,644	4,102	3,649	4,564
TRC	3.87									
Free Riders - kWh										
Free Riders - kW										
Other Naturally Occurring - kWh										
Other Naturally Occurring - kW										
Gross Energy - kWh					4,067,283	16,456,073	37,419,266	58,693,295	80,253,190	106,463,357
Gross Peak Demand - kW					910	2,730	6,374	10,476	14,124	18,689

4.2 Residential Behavior

Residential behavioral was modeled in a similar fashion to display programs is currently configured. We assumed 1.7% savings per customer and .05 kW per year. We assumed the average size of the customers declined over time and that total customers touched was 150,000. We assumed a cost of a display at \$100 per customer. Overall starting administration was 150,000. We assumed some degradation of savings overtime. Results are presented in Table 5 below. It was assumed that to keep the savings from the program the feedback activities needed to be done each year. Hence cumulative and net savings are the same.

Table 5
Residential Behavioral

Behavioral Conservation - Residential	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Net Energy Savings - kWh	0	0	7,200,000	27,600,000	56,000,000	88,536,000	125,396,000	165,332,000	208,148,000	253,844,000
Net Peak Demand Savings - kW	0	0	1,530	5,865	12,240	19,987	29,139	39,665	51,416	64,390
New Net Energy Savings - kWh	0	0	7,200,000	20,400,000	28,400,000	32,536,000	36,860,000	39,936,000	42,816,000	45,696,000
New Net Peak Demand Savings - kW	0	0	1,530	4,335	6,375	7,747	9,152	10,526	11,750	12,974
TRC	2.29									
Free Riders - kWh				27,600,000	56,000,000	88,536,000	125,396,000	165,332,000	208,148,000	253,844,000
Free Riders - kW				5,865	12,240	19,987	29,139	39,665	51,416	64,390
Other Naturally Occurring - kWh										
Other Naturally Occurring - kW										
Gross Energy - kWh			7,200,000	27,600,000	56,000,000	88,536,000	125,396,000	165,332,000	208,148,000	253,844,000
Gross Peak Demand - kW			1,530	5,865	12,240	19,987	29,139	39,665	51,416	64,390

4.3 Commercial Behavioral

The Commercial behavioral program was modeled as providing customers with a display and related software to allow them to view their load and potentially compare to other customers. It was assumed overall savings per customer was 2 %. We assumed a display/ marketing per new customer at \$500/ customer. KW savings were .2 /customer.

Table 6
Commercial Behavioral

Behavioral Conservation - Commercial	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Net Energy Savings - kWh	5,625,000	16,875,000	28,125,000	39,375,000	50,625,000	61,875,000	73,125,000	84,375,000	95,625,000	108,825,000
Net Peak Demand Savings - kW	500	3,000	5,500	8,000	10,500	13,000	15,500	18,000	20,500	23,000
New Net Energy Savings - kWh	5,625,000	11,250,000	11,250,000	11,250,000	11,250,000	11,250,000	11,250,000	11,250,000	11,250,000	13,200,000
New Net Peak Demand Savings - kW	500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
TRC	2.42									
Free Riders - kWh	0	0	0	0	0	0	0	0	0	0
Free Riders - kW	0	0	0	0	0	0	0	0	0	0
Other Naturally Occurring - kWh	0	0	0	0	0	0	0	0	0	0
Other Naturally Occurring - kW	0	0	0	0	0	0	0	0	0	0
Gross Energy - kWh	5,625,000	16,875,000	28,125,000	39,375,000	50,625,000	61,875,000	73,125,000	84,375,000	95,625,000	108,825,000
Gross Peak Demand - kW	500	3,000	5,500	8,000	10,500	13,000	15,500	18,000	20,500	23,000

4.4 Industrial Behavior

The Industrial behavioral program was providing customers with a display and software. We assumed \$1000 for the display. It was assumed overall savings for energy per customer was 2 %; demand was assumed to be 2 kw on average per customer. We per year per customer with a starting administrative costs of 50,000 per year.

Table 7
Industrial Behavioral

Behavioral Conservation - Industrial	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Net Energy Savings - kWh	0	0	0	720,000	2,160,000	4,320,000	7,080,000	10,320,000	14,040,000	9,100,000
Net Peak Demand Savings - kW	0	0	0	400	800	1,200	1,600	2,000	2,400	2,250
New Net Energy Savings - kWh	0	0	0	720,000	1,440,000	2,160,000	2,760,000	3,240,000	3,720,000	2,400,000
New Net Peak Demand Savings - kW	0	0	0	400	400	400	400	400	400	360
TRC	2.66									
Free Riders - kWh										
Free Riders - kW										
Other Naturally Occurring - kWh										
Other Naturally Occurring - kW										
Gross Energy - kWh				720,000	2,160,000	4,320,000	7,080,000	10,320,000	14,040,000	9,100,000
Gross Peak Demand - kW				400	800	1,200	1,600	2,000	2,400	2,250

4.5 New Technologies

KEMA reviewed the technologies that did not pass the cost effectiveness test in the Economic Potential analysis. The overall costs varied significantly by technology and sector. We ultimately decided to use a generic, simplistic and conservative approach and estimated new technologies to grow to approximately three percent of total energy and demand by 2020. We costed these at 10 cents/ first year per kwh to provide a placeholder cost for implementation of these technologies in a program. As noted in the next section there is much greater potential for savings from new technologies. The Table below presents the overall savings from our estimates along with an estimate of costs which is in the administrative cost line. Overall benefit cost is about 1.12. We anticipate these would in actuality be added to an existing program delivery mechanism. We feel these are a very conservative estimate of the potential impacts of new technologies.

Table 8

New Technologies

[illegible]