Cape Light Compact

Annual Report on Energy Efficiency Activities in 2008

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I. Executive Summary

A. Introduction

Since July 2001 the Cape Light Compact has delivered energy efficiency programs to all member towns on Cape Cod and Martha's Vineyard. This Annual Report provides detailed information on the Compact's energy efficiency activities and savings during the course of calendar year 2008.

The Compact's 2008 EEP was approved when the 2007-2012 Energy Efficiency Plan was approved on December 24, 2007. This funding will be referred to henceforth as the core 2008 funding.

However, on August 15, 2008, the Compact filed the Proposal of the Cape Light Compact Seeking Increased Funding for Residential Energy Efficiency Programs for 2008 and Amendment to the Approved Energy Efficiency Plan: 2007 – 2012 in response to a DPU request to increase spending for residential heating programs to cover the 2008 winter season. The updated 2008 programs included in the EEP Update were: (a) baseload, weatherization and heating system repair/retrofits for low-income Single Family customers, (b) weatherization for low-income Multi-Family customers, (c) residential weatherization and heating system retrofits through the RCS/MassSAVE program and, (d) increased public education and outreach efforts that underlie the delivery of all of the Compact's programs. On October 1, 2008, $357,000 of incremental funding was approved for these programs by the DPU. This funding will be referred to henceforth as the incremental 2008 funding.

Using the core and incremental 2008 funding as approved by the Department, the Compact implemented the following set of efficiency programs in 2008:

- The Residential ENERGY STAR® New Construction Program, which provides home buyers, home builders, and construction trade allies with technical assistance and financial incentives to increase the efficiency of homes that are newly built or undergo major renovations. Results of this program are shown in the Residential Lost Opportunity row of Table 2 and in Section III. Results of the Low-Income New Construction Program, which provides low-income housing development agencies, weatherization assistance program ("WAP") providers, and residential construction trade allies with incentives to increase the home energy rating of new low-income housing, are also included.

  In 2007, the Massachusetts Technology Collaborative approved a $1.5 million grant to the Cape Light Compact in support of the Green Affordable Housing Initiative. $1.2 million of the total funds are earmarked for renewable energy systems to be installed on newly constructed affordable homes. The remainder of the funds is for advanced building technology. The Compact was one of six grantees throughout the state.

The grant funds are for new construction homes that are designated affordable, consistent with the state guidelines. This program builds on the Cape Light Compact's already successful Residential New Construction Demonstration Pilot, which supported four homes built to "green" standards in Chatham, Orleans, and Falmouth in 2003-2004. The Compact's program will help affordable housing developers find ways to shrink the "environmental footprint" of homes and result in lower greenhouse gas emissions, including the cost of energy for those homes. The Green Affordable Housing Initiative aims to catalyze the affordable housing financing, development, and builder communities to include more green design and renewable energy in future developments.

Between 2008 and 2010, the program is expected to help build as many as 55 affordable housing units on Cape Cod and Martha's Vineyard. In 2008, this funding aided in the construction of 12 units in Provincetown that were the first to achieve LEED for Homes Platinum in the nation and 6 units that were the first single-family LEED for Homes Platinum units in the nation.

- The Residential Conservation Services RCS/MassSAVE Program, which provides all interested residential customers with energy savings education, the opportunity for a home energy audit and financial incentives for numerous electric and non-electric efficiency measures, including financial support to switch electric space heating systems to more efficient systems that use alternative fuels. Results of this program are shown in the Residential Retrofit 1-4 row of Table 2 and in Section III.
- The Residential ENERGY STAR Products and Services Program, which seeks to increase the availability and use of ENERGY STAR qualified lighting and appliances, including: clothes washers, room air conditioners, dehumidifiers and refrigerators. This program is used to implement the Northeast Energy Efficiency Partnership ("NEEP") initiatives and other regional market transformation efforts. Although the clothes washer initiative ended in program year 2007, certain eligible rebates from 2007 were paid and reported in 2008. Results of this program are divided appropriately between the Residential Lighting and Residential Appliances rows of Table 2 and in Section III.
- The Low-Income Single Family Program, which provides low-income customers in single-family dwellings with assistance in purchasing and installing efficient lighting, appliances, and weatherization measures. These services are similar to, but more extensive in ability to leverage program benefits and offer higher incentives to eligible customers, than in the RCS/MassSAVE program. Results of this program are shown in the Low Income Retrofit 1-4 row of Table 3 and in Section III.
- The Low-Income Multi-Family Program, which provides owners and managers of low-income multi-family dwellings with assistance in purchasing and installing efficient lighting, appliances and space heating measures. Results of this program are shown in the Low Income Retrofit Multifamily row of Table 3 and in Section III.

- The Commercial and Industrial New Construction Program, which provides technical assistance and financial incentives to increase the efficiency in the construction, renovation, and/or remodeling of all commercial, industrial, government and multi-family housing facilities. Results of this program are included in the C&I Lost Opportunity row of Table 4 and in Section III.
- The Medium and Large Commercial and Industrial Retrofit Program, which provides technical and financial assistance to medium and large commercial and industrial ("C&I") customers seeking to do discretionary replacements of existing operating equipment and processes in their facilities with high-efficiency alternatives. Results of this program are included in the C&I Large Retrofit row of Table 4 and in Section III.
- The Small Commercial and Industrial Retrofit Program, which provides technical assistance, financial incentives and direct installation to small C&I customers to replace existing operating equipment and systems with high-efficiency equipment. Results of this program are included in the C&I Small Retrofit row of Table 4 and in Section III.
- The Government Agencies Program, which provides technical assistance and financial incentives[1] to all government facilities, including municipal, state and federal facilities. For the purposes of reporting the results of this program in this Annual Report, in Table 4 and in Section III, the results of efficiency activities with small government customers are included in the C&I Small Retrofit row, while the results of efficiency activities with large government customers are included in the C&I Large Retrofit row. The results of government new construction activities are included in the C&I Lost Opportunity row.
- The Commercial and Industrial Products and Services Program, which seeks to increase the availability and use of more efficient motors, lighting designs, and HVAC systems. This program is used to implement NEEP and other regional market transformation initiatives. The results of this program are included in the C&I Lost Opportunity row of Table 4 and in Section III.

B. Report Organization

This Executive Summary provides an overview of the Compact's energy efficiency programs' (referred to as BCR Activities) benefits and costs. For each sector there are tables summarizing the lifetime energy savings, lifetime capacity savings, the non-electric benefits (NEBs), and the dollar values of the total benefits[2] and the total costs.

[1] Unlike the Compact's other C&I Programs, where a customer co-pay is required, the Government program covers the entire cost of eligible energy efficiency services resulting from an audit up to a cap of $75,000 per project.

[2] The Compact is submitting, consistent with other Program Administrators practice and statewide guidance from the Department of Energy Resources, its benefit-cost ratios for its 2008 energy efficiency

The savings data are presented in terms of both "preliminary" and "evaluated" data.

- The preliminary data refers to savings estimates that are based on the evaluation impact factors that were used in the 2007 Annual Report and the Proposal of the Cape Light Compact Seeking Increased Funding for Residential Energy Efficiency Programs for 2008 and Amendment to the Approved Energy Efficiency Plan: 2007 – 2012 (referred to henceforth as the Amended 2008 EEP).[3] Using this data allows for the most direct comparison with the estimated savings from the Amended 2008 EEP.
- The evaluated data refers to savings results that are based on evaluation impact factors from all of the program evaluations that have been prepared since the EEP was filed. Thus, the evaluated data presents our best estimate of the efficiency savings, based on all the evaluation information available at this time. Appendix 2 presents the impact factors that were used to prepare the evaluated results.

Section II of this Annual Report provides a discussion of the methodology that is used for program monitoring and evaluation. It presents a brief summary of the types of evaluations that are used, and a description of the methodology for estimated net energy savings. It also includes a list of the evaluation studies that were used to prepare the 2008 evaluated efficiency savings results. These evaluation studies are also used to inform program design and delivery.

Section III of this Annual Report provides more detailed results of the program activities. The tables in this section include information regarding the number of program participants, the annual efficiency savings and non-electric benefits, the benefit-cost ratio of the program, and the savings impacts by type of end-use (lighting, HVAC, motors, refrigeration, hot water, and end-user behavior). This section also summarizes recent evaluation report findings where relevant. Finally, the appendices provide more detail regarding the monitoring and evaluation results and the program savings. Of particular interest in this Annual Report, Appendix 3 provides greater detail of program budgets (by category) and savings (by type).

C. Summary of Results

Table 1 provides a summary of the program expenses and savings. It also presents the percent change between the final evaluated results and (a) the preliminary evaluated results, and (b) the estimates of expenses and savings targets in the Compact's Amended 2008 EEP. The values in the "Amount" column are the 2008 results, based on all evaluations available at this time.

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programs with additional capacity benefits in the form of a demand reduction induced price effect ("DRIPE").

[3] D.P.U. 07-47, Proposal of the Cape Light Compact Seeking Increased Funding for Residential Energy Efficiency Programs for 2008 and Amendment to the Approved Energy Efficiency Plan: 2007 – 2012 (August 15, 2008) (the "Amended 2008 EEP").

TABLE 1				
SAVINGS AND EXPENSES FOR 2008				
Measurement	Amount	Units	Percent Change Comparison	
			(Eval-Pre)/Eval	(Eval-Plan)/Eval
Prorgram Implementation Expenses	$5.367	$ - Millions	0%	-4%
Total Expenses	$5.486	$ - Millions	0%	-6%
Annual Energy Savings	10.070	GWh	-31%	-20%
Annual Summer Demand Savings	1.954	MW	-4%	-11%
Annual Winter Demand Savings	2.357	MW	-38%	-5%
Lifetime Energy Savings	104.291	GWh	-17%	-10%
Lifetime Demand Savings	25.551	MW-Years	-1%	-25%
Total Resource Cost Test	3.362	Benefit / Cost	-8%	4%
Performance Incentive - After Taxes	-	$ - Millions	-	0%

Program implementation expenses include all of the costs incurred by the Compact, except for monitoring and verification costs. Total expenses include program implementation costs, plus monitoring and verification costs, plus customer contributions.

The Compact's 2008 program implementation expenses were roughly 4% lower than the budgets in the Amended 2008 EEP and the total expenses were roughly 6% lower than the budgets in the Amended 2008 EEP. The lower program implementation expenses were primarily due to reduced program administrative costs. The reduced program administrative costs were due to the reorganization of functions, including bringing the customer call center 800# in-house in August, 2008, that not only provide cost efficiency but also increase customer service through direct access to program support staff. Additionally, a portion of planned customer incentives and technical assistance that was unspent in 2008 was due to timing of completion of payments and will be carried-over to 2009. The lower total expenses were due to reduced evaluation costs. The reduced evaluation costs were due to the continued benefits of shared costs among all program administrators participating in joint statewide and regional studies.

The annual and lifetime energy savings achieved in 2008 were lower than those estimated in the Amended 2008 EEP (by 20% and 10%, respectively). Also, the annual summer, annual winter, and lifetime capacity savings achieved in 2008 were lower than those estimated in the Amended 2008 EEP (by 11%, 5%, and 25%, respectively). Savings declines were primarily experienced in the Residential Lighting, Residential Appliances and Low Income Retrofit 1-4 programs. In the Residential Lighting program, CFL and outdoor fixture uptake was lower than projected. However, the primary drivers of the savings declines were decreases in measure lives for coupon bulbs, savings for markdown bulbs, and the net to gross ratios for all lighting products. In the Residential Appliances program, uptake of room air conditioners and dehumidifiers was significantly lower than estimated. In the Low Income Retrofit 1-4 program, uptake on weatherization and refrigerators was lower than estimated.

The benefit-cost ratio of the 2008 programs in total was 3.36. This indicates that the Compact's programs in total are highly cost-effective, where every $1.00 spent reduces the net cost of electricity by $3.36.

D. Summary of Results by Sector

1. Residential Programs

Table 2 presents the lifetime energy savings, lifetime capacity savings, and lifetime non-electric benefits for each of the residential programs. It also presents the total cumulative benefits and costs, in 2008 present value dollars. These total benefits and costs are used to determine whether each program is cost-effective, based on the total resource cost (TRC) test.

TABLE 2
SUMMARY OF RESIDENTIAL BCR ACTIVITIES

Benefit-Cost Ratio	Lifetime MWH		Lifetime kW		Lifetime $ NEB		TRC Values	
Activity	Preliminary	Report	Preliminary	Report	Preliminary	Report	$-Benefits	$-Costs
A02a Residential Lost Opportunity	2,255	2,188	133	133	$1,059,477	$1,059,477	$1,259,638	$561,557
A02b Residential HVAC	-	-	-	-	$0	$0	$0	$0
A03a Residential Retrofit 1-4	20,311	20,311	7,046	7,046	$3,976,992	$3,976,992	$6,933,659	$1,794,286
A03b Residential Retrofit Multifamily	NA	NA	NA	NA	NA	NA	NA	NA
A03c Residential Load Response	NA	NA	NA	NA	NA	NA	NA	NA
A04a Residential Lighting	39,004	21,654	2,545	2,238	$341,556	$202,156	$2,452,127	$365,406
A04b Residential Appliances	692	694	287	288	$50,594	$50,594	$165,894	$155,032
Total	62,262	44,847	10,013	9,706	$5,428,620	$5,289,220	$10,811,317	$2,876,281

Figures 1 through 4 present the same information as Table 2. They indicate that most of the residential energy and capacity savings are obtained from the Residential Retrofit 1-4 and Residential Lighting programs; that most of the non-electric benefits come from the Residential Retrofit 1-4 program; and that all residential programs are cost effective.

The evaluated lifetime MWh savings is lower than the preliminary lifetime MWh savings for the Residential Lost Opportunity program due to the application of a savings adjustment factor. The evaluated lifetime MWh and lifetime kW savings is lower than the preliminary lifetime MWh and lifetime kW savings for the Residential Lighting program due to the decreases in measure lives for coupon bulbs, savings for markdown bulbs, and the net to gross ratios for all lighting products. The evaluated lifetime non-electric benefits are lower than the preliminary lifetime non-electric benefits for the Residential Lighting program due to the decrease in the measure life for coupon bulbs. The evaluated lifetime MWh savings and lifetime kW savings is higher than the preliminary lifetime MWh and lifetime kW savings for the Residential Appliances program due to the application of a dehumidifier savings adjustment factor.

FIGURE 1
RESIDENTIAL LIFETIME MWH

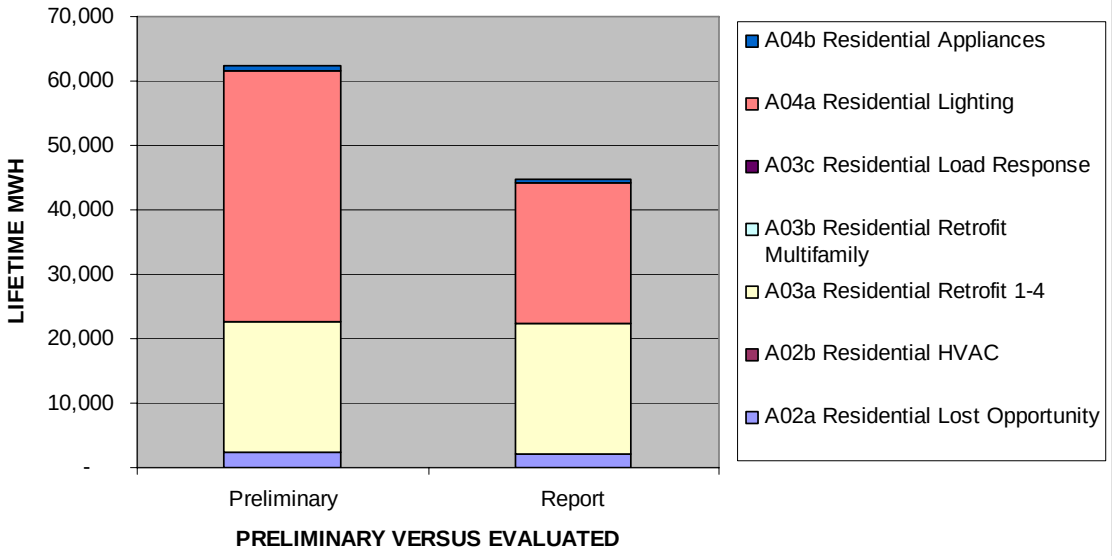
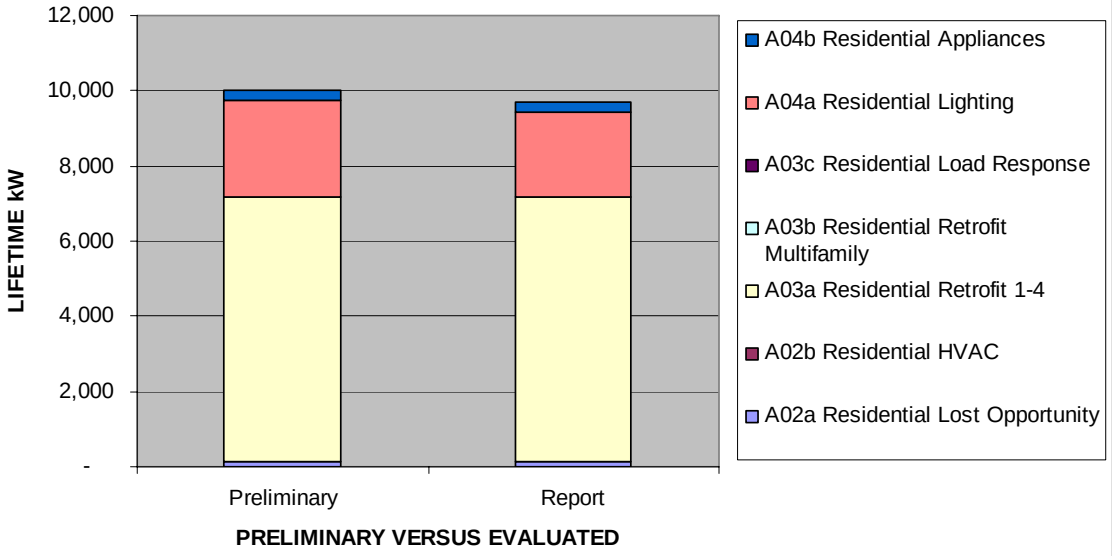
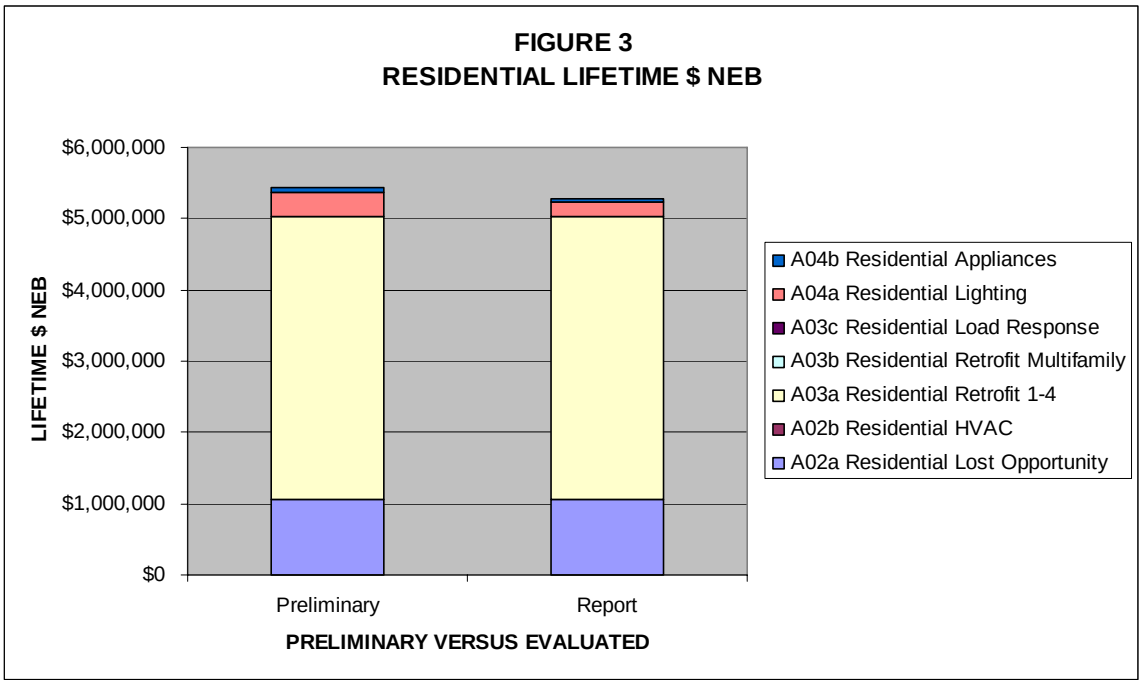
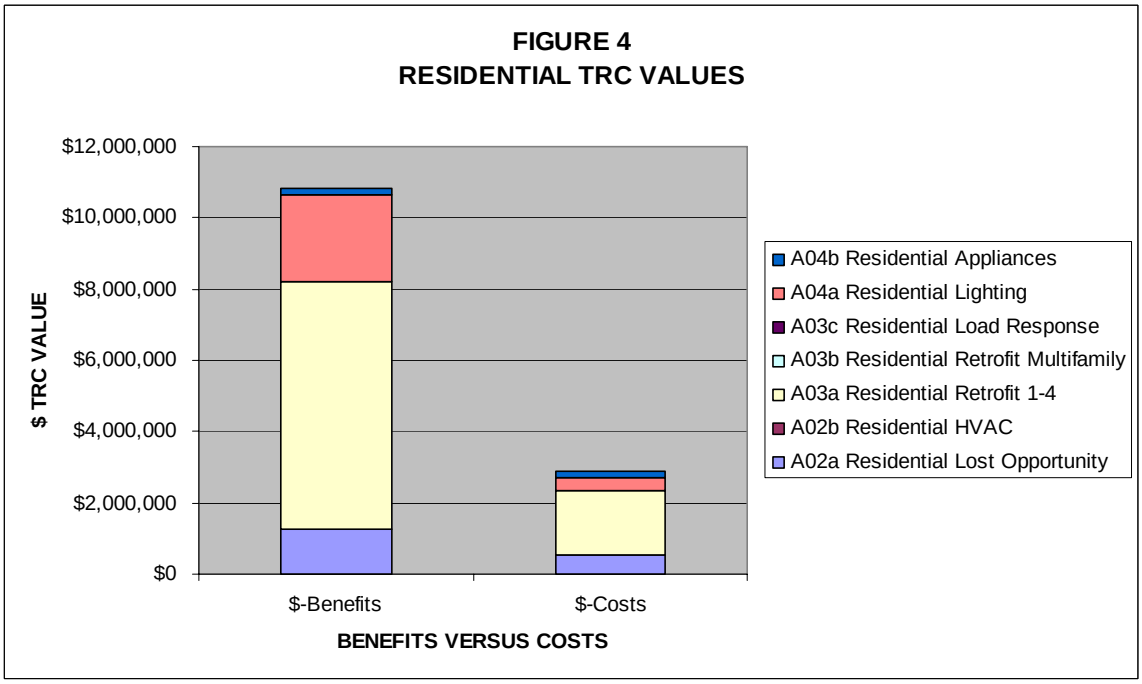


FIGURE 2
RESIDENTIAL LIFETIME kW







2. Low-Income Programs

Table 3 presents the lifetime energy savings, lifetime capacity savings, and lifetime non-electric benefits for each of the low-income programs. It also presents the total cumulative benefits and costs, in 2008 present value dollars. These total benefits and costs are used to determine whether each program is cost-effective, based on the total resource cost test.

TABLE 3								
SUMMARY OF LOW-INCOME BCR ACTIVITIES								
Benefit-Cost Ratio	Lifetime MWH		Lifetime kW		Lifetime $ NEB		TRC Values	
Activity	Preliminary	Report	Preliminary	Report	Preliminary	Report	$-Benefits	$-Costs
B02a Low-Income Lost Opportunity	-	-	-	-	$0	$0	$0	$0
B03a Low-Income Retrofit 1-4	6,032	6,032	420	420	$2,184,424	$2,184,424	$2,708,448	$647,520
B03b Low-Income Retrofit Multifamily	3,381	3,381	74	74	$383,481	$383,481	$630,360	$97,565
Total	**9,412**	**9,412**	**494**	**494**	**$2,567,905**	**$2,567,905**	**$3,338,808**	**$745,085**

Figures 5 through 8 present the same information graphically as listed in Table 3. They indicate that most of the energy and capacity savings and non-electric benefits are coming from the Low Income Retrofit 1-4 program and all of the programs are cost-effective. There is no difference between the evaluated and preliminary results for low income programs since there were no updates from evaluation studies this year.

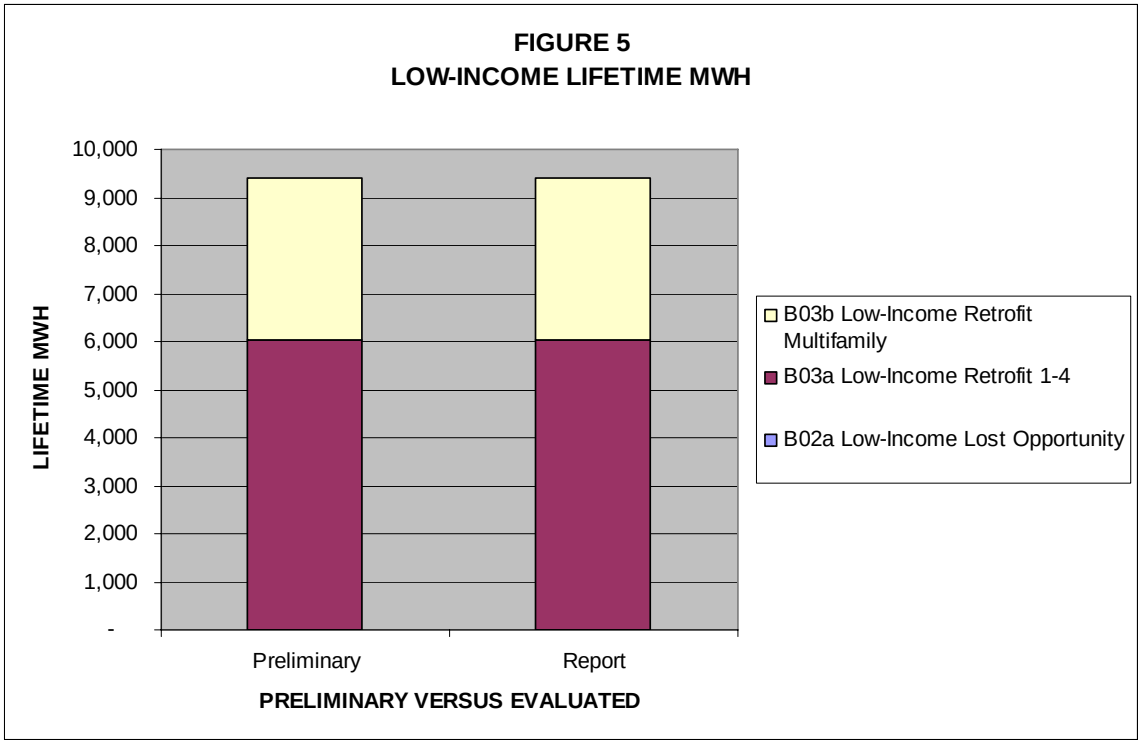


FIGURE 6
LOW-INCOME LIFETIME kW

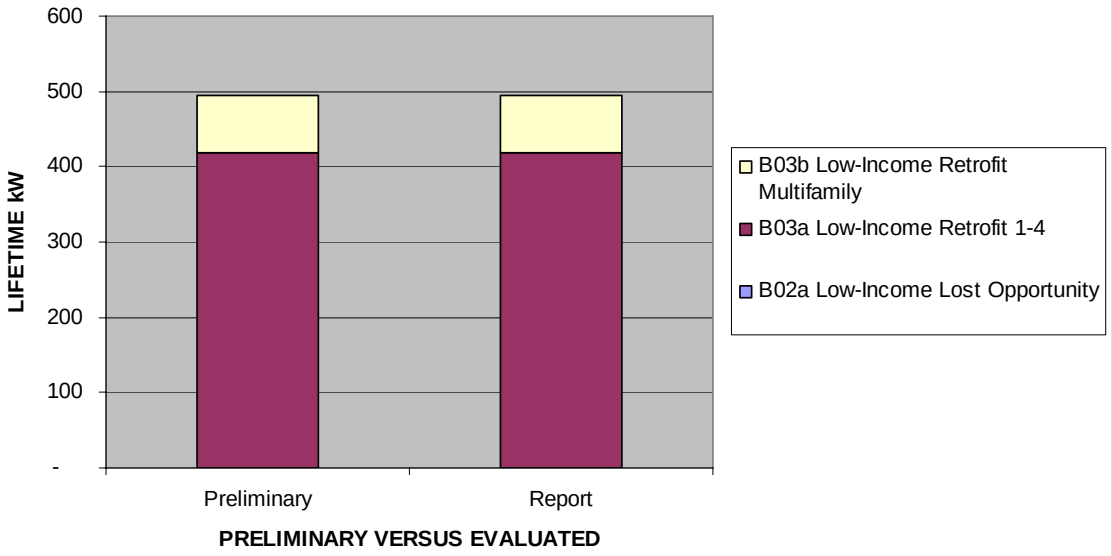
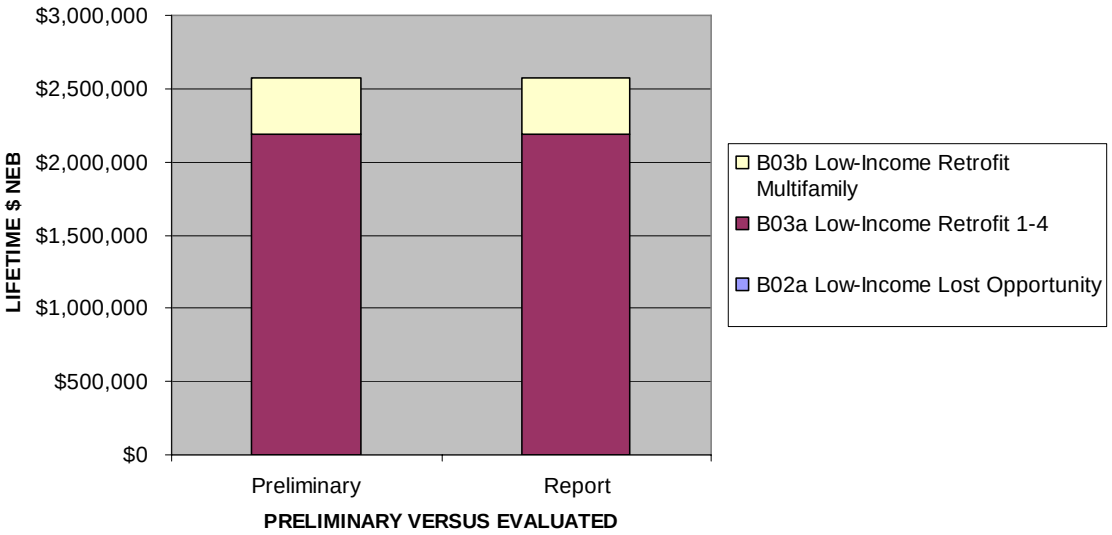
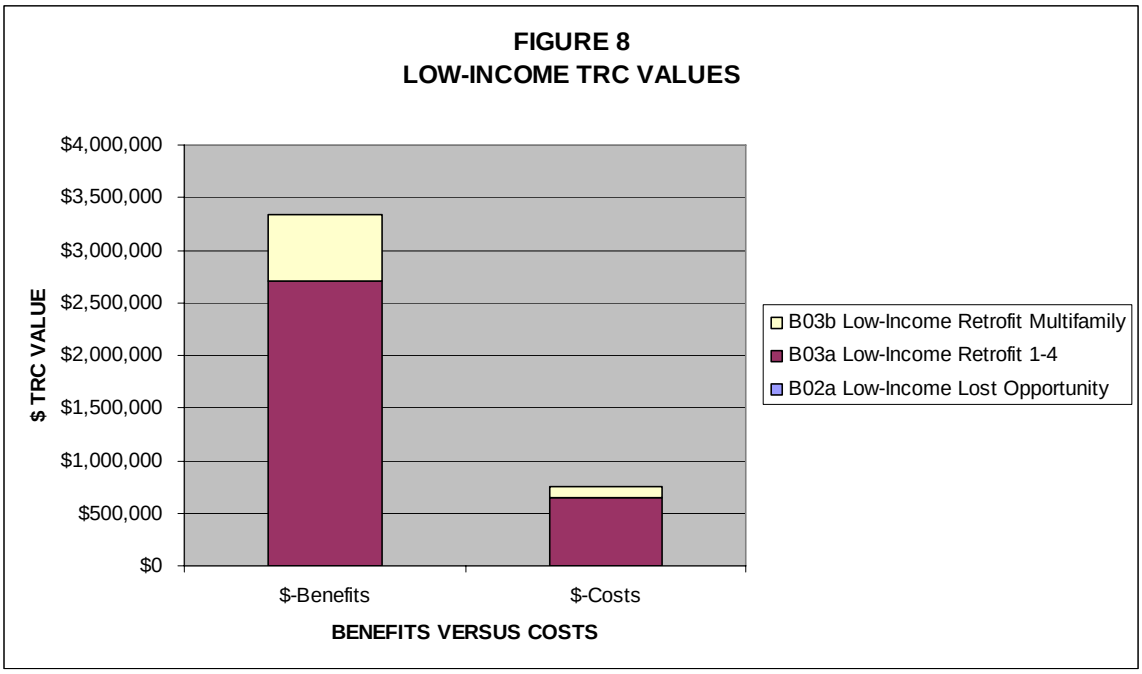


FIGURE 7
LOW-INCOME LIFETIME $ NEB





3. Commercial & Industrial Programs

Table 4 presents the lifetime energy savings, lifetime capacity savings, and lifetime non-electric benefits for each of the Commercial & Industrial programs. It also presents the total cumulative benefits and costs, in 2008 present value dollars. These total benefits and costs are used to determine whether each program is cost-effective, based on the total resource cost (TRC) test.

TABLE 4
SUMMARY OF C&I BCR ACTIVITIES

Benefit-Cost Ratio Activity	Lifetime MWH		Lifetime kW		Lifetime $ NEB		TRC Values	
	Preliminary	Report	Preliminary	Report	Preliminary	Report	$-Benefits	$-Costs
C02a C&I Lost Opportunity	10,998	10,998	2,708	2,708	$71,775	$71,775	$1,492,024	$337,348
C03a Large C&I Retrofit	10,660	10,660	4,673	4,673	$13,587	$13,587	$1,824,816	$700,254
C03b Small C&I Retrofit	28,375	28,374	7,970	7,970	$165,302	$165,300	$4,090,215	$1,752,271
Total	**50,032**	**50,032**	**15,351**	**15,351**	**$250,663**	**$250,662**	**$7,407,055**	**$2,789,873**

Figures 9 through 12 present the same information as Table 4. They indicate that much of the energy and capacity savings and non-electric benefits come from the Small C&I Retrofit program; and that all of the programs are cost-effective.

The evaluated lifetime MWh savings is slightly lower than the preliminary lifetime MWh savings for the Small C&I Retrofit program due to the application of what was previously a lighting realization rate as a savings adjustment factor.[4] This change also impacted the calculation of the lifetime non-electric benefits and explains why the evaluated lifetime non-electric benefits are slightly lower than the preliminary lifetime non-electric benefits for this program.

[4] It was determined that the results from the Multiple Small Business Services Programs Impact Evaluation 2007, Final Report Update, by Summit Blue Consulting, September 2, 2008 only apply to energy savings and not demand savings.

FIGURE 9
C&I LIFETIME MWH

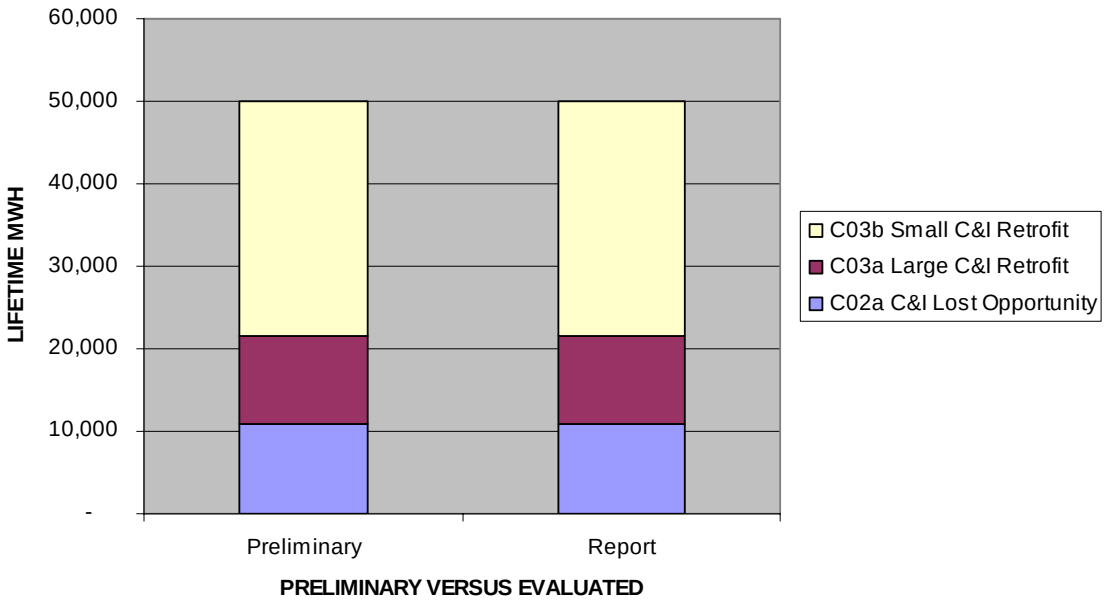


FIGURE 10
C&I LIFETIME kW

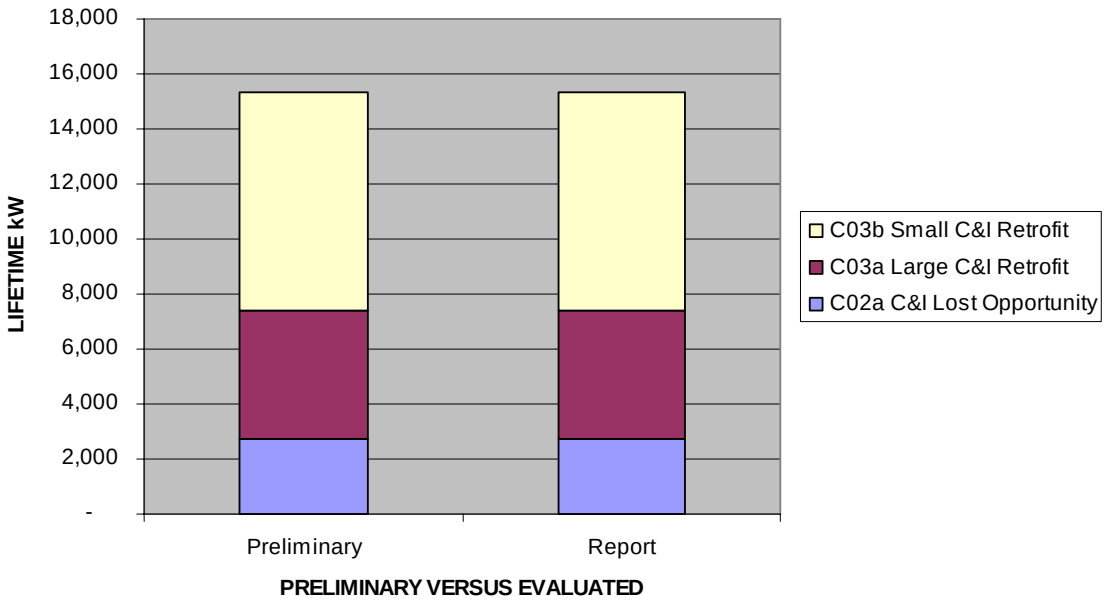


FIGURE 11
C&I LIFETIME $ NEB

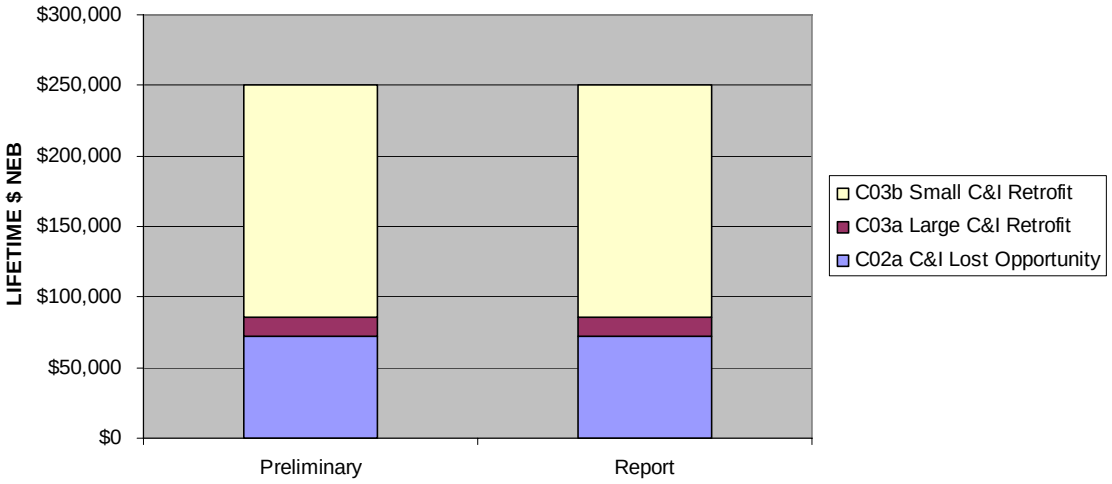
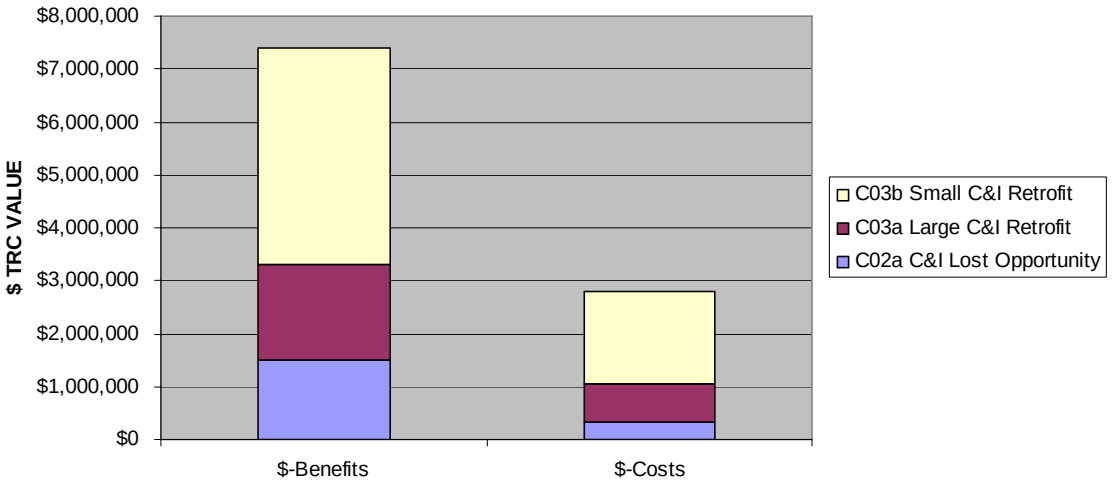


FIGURE 12
C&I TRC VALUES



II. Overview of Evaluation Methodology

Preliminary versus Evaluated Results

As noted above, the savings data in this report are presented in terms of both "preliminary" and "evaluated" data.

- The preliminary data refers to savings estimates that are based on the evaluation impact factors[5] that were used in the 2007 Annual Report and the Proposal of the Cape Light Compact Seeking Increased Funding for Residential Energy Efficiency Programs for 2008 and Amendment to the Approved Energy Efficiency Plan: 2007 – 2012 (referred to as the Amended 2008 EEP).[6] Using this data allows for the most direct comparison with the estimated savings from the Amended 2008 EEP.
- The evaluated data refers to savings results that are based on evaluation impact factors from all of the program evaluations that have been prepared since the 2008 EEP was filed. Thus, the evaluated data presents our best estimate of the efficiency savings, based on all the evaluation information available at this time. Appendix 2 presents the impact factors that were used to prepare the evaluated results.

Evaluation Studies Used in Preparing 2008 Evaluated Results

Since its inception in July 2001, the Compact has participated in many state-wide and regional monitoring and evaluation studies, along with other energy efficiency Program Administrators. The Compact has also conducted several evaluation studies specific to its own programs. It is common for energy efficiency program evaluators to update parameters on a multi-year cycle, unless significant program changes warrant more frequent study.

The evaluation studies completed in 2008 that were used to update impact factors or to inform the process of program delivery are listed below. In 2008 the studies included a mix of process and impact evaluation and other research. The executive summaries of these reports are included in Appendix 5.

- Evaluation of the Massachusetts New Homes with ENERGY STAR 2008 Findings and Analysis" by Nexus Market Research and Dorothy Conant, July 2, 2009.
- The Massachusetts New Homes with ENERGY STAR Program 2008 Progress Report, by Dorothy Conant, July 6, 2009.
- Residential Lighting Markdown Impact Evaluation by Nexus Market Research, RLW Analytics, Inc, and GDS Associates, January 20, 2009.
- Massachusetts Residential Appliance Saturation Survey, FINAL, by Opinion Dynamics Corporation, April 2009.

[5] Evaluation impact factors include measure lives, free-ridership rates, spillover rates, in-service rates, and realization rates.

[6] D.P.U. 07-47, Proposal of the Cape Light Compact Seeking Increased Funding for Residential Energy Efficiency Programs for 2008 and Amendment to the Approved Energy Efficiency Plan: 2007 – 2012 (August 15, 2008) (the "Amended 2008 EEP").

Types of Evaluations

The evaluation of 2008 energy efficiency program impacts reflects the Compact's efforts to apply appropriate methodologies and adjust them for individual program characteristics. The diverse nature of the programs, including the magnitude of preliminary kW and kWh impacts, the number of customers served, and the end uses affected, calls for the adoption of different evaluation approaches. Evaluations of some programs use several methodologies to develop overall impact results and provide meaningful feedback on program delivery and direction. Some of these methodologies are briefly described below.

Survey-Based Impact Parameter Studies. Survey-based impact parameter studies focus on the analysis of information collected through customer surveys. They are generally used to measure free-ridership and spillover. These studies provide timely feedback to program managers as well as input to the impact evaluations.

Billing Analyses. Billing analyses involve the analysis of billing data, combined in some cases with survey data, to determine impacts for programs where a large number of participants install similar measures. Since billing data are available for all customers, billing analysis techniques may include representative samples of both participants and non-participants in an evaluation.

- In 2008, the Massachusetts program administrators jointly funded evaluation of New Homes with ENERGY STAR included a billing analysis to develop a heating savings adjustment factor.

Site Specific Measurement Analysis. Impact evaluations for many of the end uses and programs covered in this report rely on engineering estimates that are based on site-specific metering and on-site telephone assessments of measure performance and persistence.

Process and Market Progress Evaluation Studies. Process evaluations review energy efficiency program design and implementation, and recommend modifications to program delivery. The scope of these evaluations includes all aspects of the program including administrative efficiency, the quality of service provided, and the databases used for program tracking and reporting. Process evaluations assess the early stages of energy efficiency programs. They specifically provide an assessment of (a) whether actual operations resemble the intended program design and operation plan, and (b) whether real-world experience shows that the original program design and implementation plan are appropriate given the existing field conditions.

- In 2008, the Cape Light Compact co-sponsored a Residential Appliance Saturation Survey that characterizes current penetrations and saturations of energy consuming equipment by residential customers in Massachusetts. Results from this study can help inform impact calculations and planning assumptions.

Economic Modeling and Analysis Studies. The benefits and cost-effectiveness of energy efficiency programs are based on modeling and analysis that values energy efficiency in relation to the avoided costs of energy supply projected over the life of the programs and measures installed. Avoided costs are typically projected based on forecasting models.

The cost-effectiveness results presented in this report – both preliminary and evaluated – are all based on the avoided cost estimates that were used in preparing the Amended 2008 EEP. This approach allows for a more direct comparison of the economic results between the Amended 2008 EEP and the 2008 Annual Report. The avoided cost estimates used for both of these studies are taken from the following report: Synapse Energy Economics, Inc., *Avoided Energy Supply Costs in New England*, 2007 Final Report, prepared for the Avoided Energy Supply Component (AESC) Study Group, Revised - January 3, 2008.

Generic Impact Equations

The general form of the impact equation for most of the measures installed is:

Net Impacts = Gross Impacts * Realization Rate*(1-Free-Ridership + Spillover) * Persistence Factor.

Realization Rates are study-specific parameters, which typically compare the energy or demand performance of installed equipment to initial estimates of performance. They are typically based on engineering or billing analysis.

Free-ridership includes both partial and pure free-ridership, where such information is available, as required by D.T.E 98-100.

In energy efficiency programs, spillover may occur among both participants and nonparticipants. Both participant and nonparticipant spillover were used in the calculation of savings for commercial and industrial programs, consistent with D.T.E. 98-100. The nonparticipant spillover impact used in this report is based on the combined results of National Grid and Compact surveys.

Persistence indicates the continued presence of savings over time as indicated by follow-up surveys that confirm the measure remains installed, and verify it is operating as intended. As defined by the 2005 Measure Life Study, "Savings persistence is the percent change in expected savings due to changed operating hours, changed process operation, and/or degradation in equipment efficiency relative to the baseline efficiency option".

Measure lives are applied to net annual kW and kWh to calculate lifetime kW and kWh. As defined by the 2005 Measure Life Study[7], measure life is "The median number of years that a measure is installed and operational. This definition implicitly includes equipment life and measure persistence, but not savings persistence….In addition, this definition conforms in letter or in spirit with the definition of measure life used by most national utilities."

[7] *Measure Life Study Report* prepared for the Massachusetts Joint Utilities by Energy Resource Solutions (ERS), October 10, 2005.

Performance Metrics

As a not-for-profit inter-governmental organization, the Compact does not require shareholder performance incentives, and thus does not need to monitor or track any form of performance metrics.

III. Impacts by BCR Activity

A. Residential

1. By BCR Activity

Table 5 presents a summary of the number of customers served, the annual savings, the lifetime savings, and the costs incurred for the residential programs. It also presents the benefit-cost ratio, based on the total resource cost test. The costs and benefits used to derive this ratio are the same as those presented in Table 2.

The Residential Retrofit 1-4 and Residential Lighting Programs provide the greatest annual energy and capacity savings. All of the residential programs are cost-effective. However, the Residential Lighting program is particularly cost-effective and remained highly cost-effective, despite the updates to the impact factors by an evaluation study that reduced the savings and benefits of this program.

TABLE 5
IMPACT BY RESIDENTIAL BCR ACTIVITIES

Benefit-Cost Ratio / Activity	Participant	Annual				Lifetime			Cost		Benefit-Cost
		kWh	kWh per Cust	kW	$-NEB	MWH	kW	$-NEB	Activity	per Cust	TRC
A02a Residential Lost Opportunity	91	267,831	2,943	17.05	$46,528	2,188	133	$1,059,477	$561,557	$6,171	2.24
A02b Residential HVAC	-	-	NA	-	$0	-	-	$0	$0	NA	NA
A03a Residential Retrofit 1-4	2,462	2,068,460	840	388.29	$236,229	20,311	7,046	$3,976,992	$1,794,286	$729	3.86
A03b Residential Retrofit Multifamily	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A03c Residential Load Response	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A04a Residential Lighting	3,309	3,279,409	991	335.56	$31,214	21,654	2,238	$202,156	$365,406	$110	6.71
A04b Residential Appliances	476	64,371	135	26.83	$4,644	694	288	$50,594	$155,032	$326	1.07
Total	6,338	5,680,072	896	767.73	$318,614	44,847	9,706	$5,289,220	$2,876,281	$454	3.76

2. By End Use

Table 6 presents a summary of the lifetime energy savings, capacity savings, and non-electric benefits, by the different end-uses addressed in the residential programs. Lighting and HVAC provide the majority of energy and capacity savings from the residential programs. Most of the residential non-electric benefits are from HVAC.

The residential impact factors were updated by evaluation studies. There are significant differences between preliminary and evaluated results for Lighting. The evaluated lifetime MWh and lifetime kW savings and non-electric benefits are substantially lower than the preliminary lifetime MWh and lifetime kW savings and non-electric benefits for Lighting measures due to adjustments to several impact factors.

TABLE 6						
IMPACT BY RESIDENTIAL END-USES						
End Use	**Lifetime MWH**		**Lifetime kW**		**Lifetime $ NEB**	
	Preliminary	**Report**	**Preliminary**	**Report**	**Preliminary**	**Report**
Lighting	50,480	33,130	3,295	2,988	$428,626	$289,226
HVAC	10,673	10,674	6,462	6,463	$3,774,612	$3,774,612
Refrigeration	312	312	26	26	$0	$0
Hot Water	797	731	230	230	$1,225,381	$1,225,381
Motors	0	0	0	0	$0	$0
End User Behavior	NA	NA	NA	NA	NA	NA
Total	**62,262**	**44,847**	**10,013**	**9,706**	**$5,428,620**	**$5,289,220**

Figures 13 through 15 present the same information as Table 6.

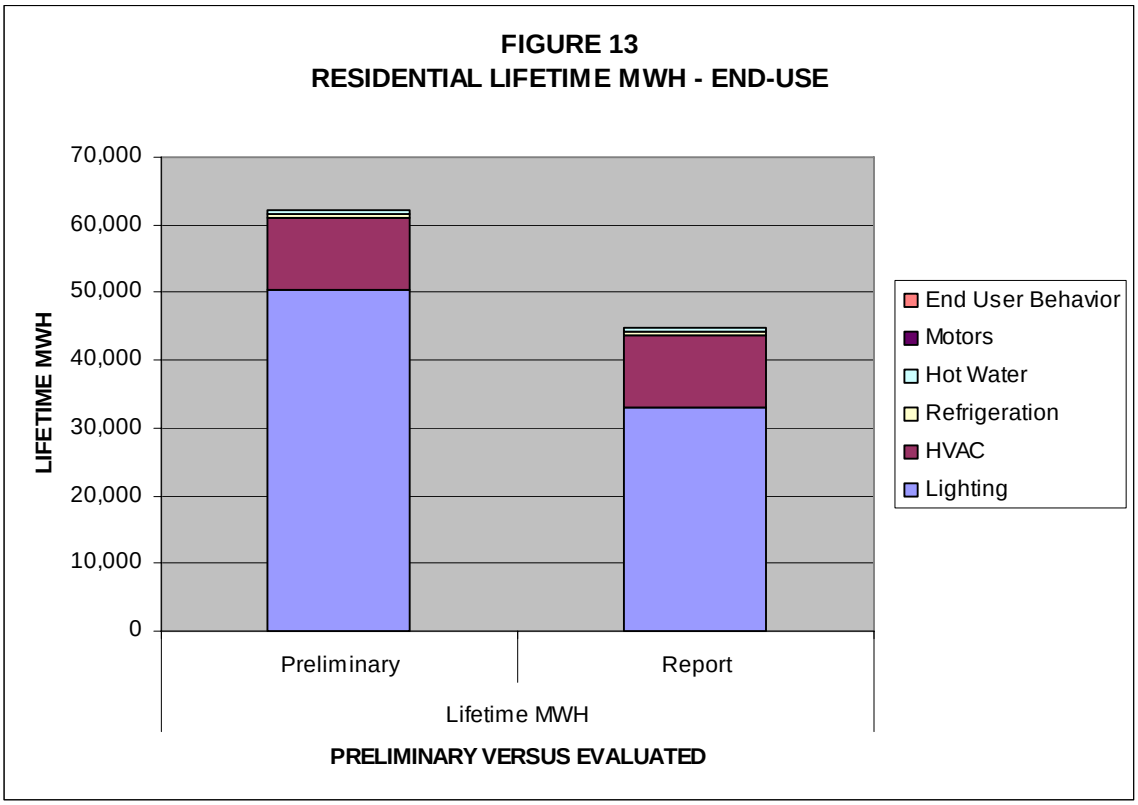
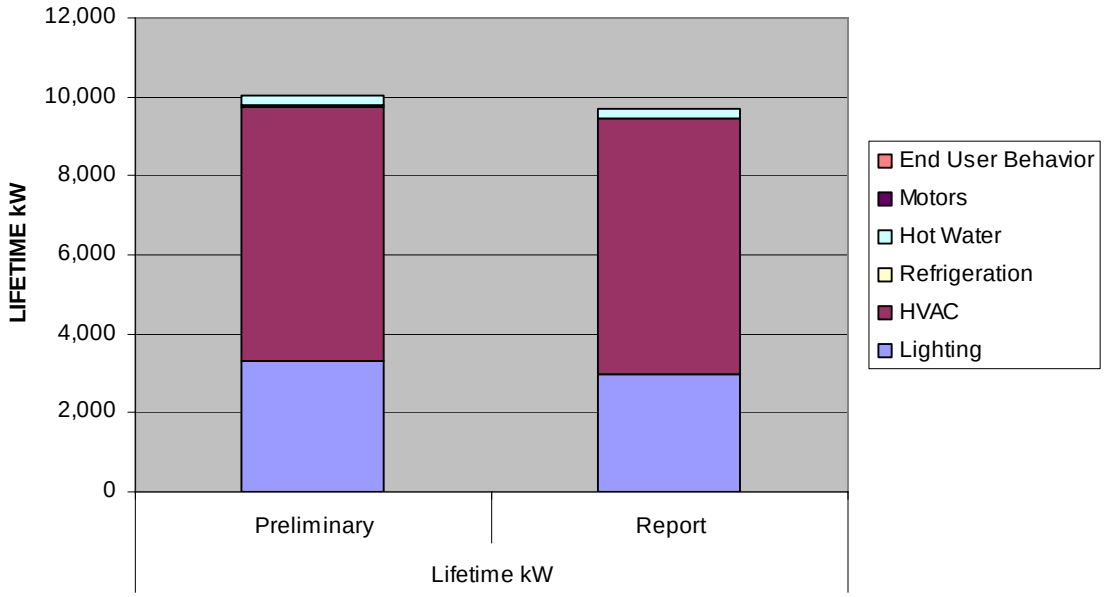
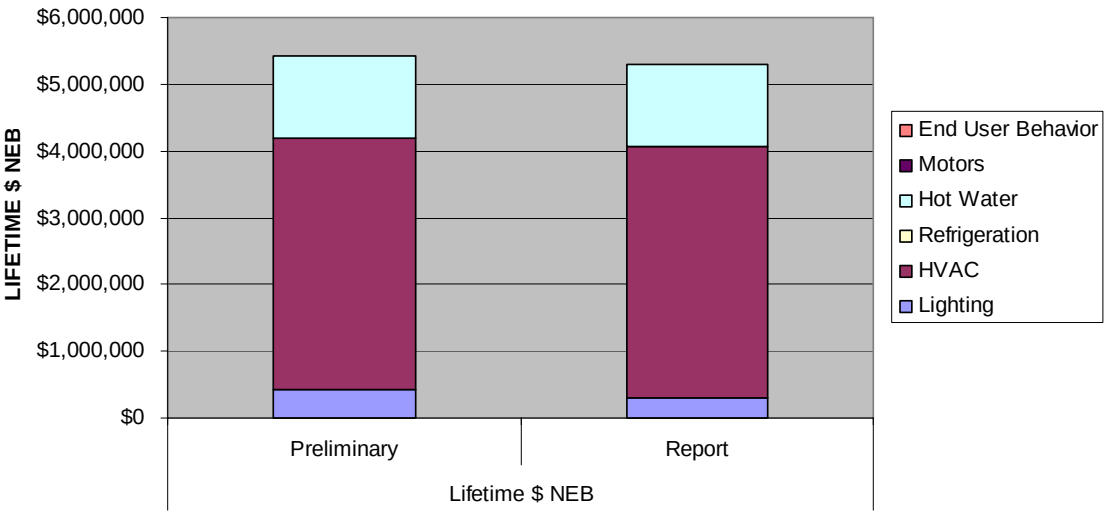


FIGURE 14
RESIDENTIAL LIFETIME kW - END-USE



PRELIMINARY VERSUS EVALUATED

FIGURE 15
RESIDENTIAL LIFETIME $ NEB - END- USE



BENEFITS VERSUS COSTS

3. Program Evaluation

The Residential ENERGY STAR® New Construction Program

In 2009, the Joint Management Committee (JMC) completed an evaluation report.[8] The evaluation included:

- A billing analysis of homes built through the Program in 2006 and 2007 (which provided adjustment factors for both the User-Defined Reference Home and the As-Built ENERGY STAR-Qualified Home); and,
- An estimation of the value to homeowners of 7 non-electric impacts; and interviews with the owners of buildings who participated in the free CFL component of the program.

The billing analysis generated an adjustment factor for the gross energy savings from the heating end-use. This adjustment factor was applied to the savings assumption and impacted the savings and benefits calculated for this program. This adjustment factor calibrates savings derived from the simulation model for to estimate savings for each participating home with actual weather-normalized energy consumption as observed on customer bills.

The evaluation report also found that the recession and housing market decline of 2008 had significant effects on the program, both in terms of a reduction in the number of qualified homes built, and an increase in builders' perceptions of the value of the ENERGY STAR label on a home. Additionally, the evaluation also found that the Program's steps toward a market-driven model, having builders choose their own HERS raters and giving them the option to select and install CFLs themselves, also appear to be working well.

The Residential Lighting Program

In 2009, an impact evaluation[9] was conducted to provide updated information on markdown and buydown programs in New England states. The study developed load shapes, coincidence factors, delta watts, daily and annual hours of use, and first-year and lifetime installation rates. Results are based on a telephone surveys and on-site visits of randomly selected and sampled homes that were conducted for the sole purpose of finding recently purchased and installed markdown CFLs. The methodology was selected to ensure that winter load shape and coincidence factor results could be obtained.

[8] Evaluation of the Massachusetts New Homes with ENERGY STAR 2008 Findings and Analysis" by Nexus Market Research and Dorothy Conant, July 2, 2009.

[9] Residential Lighting Markdown Impact Evaluation by Nexus Market Research, RLW Analytics, Inc, and GDS Associates, January 20, 2009.

The Residential ENERGY STAR Products and Services Program

In 2009, an appliance saturation survey[10] was conducted, based on a mail/internet survey and in-home verification of a subset of the survey respondents' residences. The primary purpose of this study was to determine the penetration and saturation of Massachusetts homes with appliances and other energy using equipment. The study was conducted statewide, though program administrator-specific results were also provided. Cape Light Compact had the highest response rate (28%) of any population stratum/service territory included in the survey. While information from this survey is useful in planning and in understanding baseline levels of penetration and saturation of appliances and other residential end-use equipment in the state and in service providers' territories, the results of this study did not influence the impact factors used to estimate the savings and benefits from this program. However, the study informed an adjustment factor for dehumidifier savings in the Cape Light Compact service territory.[11]

B. Low-Income

1. By BCR Activity

Table 7 presents a summary of the number of customers served, the annual savings, the lifetime savings, and the costs incurred for the low-income programs. It also presents the benefit-cost ratio, based on the total resource cost test. The costs and benefits used to derive this ratio are the same as those presented in Table 3.

The Low Income Retrofit 1-4 Program contributes greater annual and lifetime energy and capacity savings and non-electric benefits due to the fact that there are a greater number of participants in this program. All of the programs are cost effective.

TABLE 7
IMPACT BY LOW-INCOME BCR ACTIVITIES

Benefit-Cost Ratio / Activity	Participant	Annual				Lifetime			Cost		Benefit-Cost
		kWh	kWh per Cust	kW	$-NEB	MWH	kW	$-NEB	Activity	per Cust	TRC
B02a Low-Income Lost Opportunity	-	-	NA	-	$0	-	-	$0	$0	NA	NA
B03a Low-Income Retrofit 1-4	481	475,894	989	47.17	$166,399	6,032	420	$2,184,424	$647,520	$1,346	4.18
B03b Low-Income Retrofit Multifamily	81	157,048	1,939	6.70	$20,633	3,381	74	$383,481	$97,565	$1,205	6.46
TOTAL	562	632,942	1,126	53.86	$187,032	9,412	494	$2,567,905	$745,085	$1,326	4.48

2. By End Use

Table 8 presents a summary of the lifetime energy savings, capacity savings, and non-electric benefits, by the different end-uses addressed in the low-income programs. Most of the energy and capacity savings for low income are from the Lighting and HVAC end

[10] Massachusetts Residential Appliance Saturation Survey, FINAL, by Opinion Dynamics Corporation, April 2009.

[11] The Massachusetts Residential Appliance Saturation Survey, FINAL, by Opinion Dynamics Corporation, April 2009 showed higher hours of operation for dehumidifiers in the Cape Light Compact's territory as compared to other territories and the state as whole. This adjustment factor was applied to account for this difference.

uses. Most of the low-income non-electric benefits come from the HVAC measures. This is because the home energy audits result in benefits associated with (a) improved property values, (b) reduced fire, illness and moving costs, and (c) fossil-fuel savings. All of the low-income programs also have non-electric benefits as a result of reduced usage of the low-income discount rate. The low income programs also have non-electric benefits that are experienced by non-low-income residential customers, such as lighting O&M savings and reduced water usage.

There is no difference between the evaluated and preliminary results for low income programs since there were no updates from evaluation studies this year.

TABLE 8
IMPACT BY LOW-INCOME END-USES

End Use	Lifetime MWH		Lifetime kW		Lifetime $ NEB	
	Preliminary	Report	Preliminary	Report	Preliminary	Report
Lighting	4,990	4,990	325	325	$102,807	$102,807
HVAC	4,059	4,059	85	85	$2,121,876	$2,121,876
Refrigeration	309	309	53	53	$37,186	$37,186
Hot Water	54	54	31	31	$306,037	$306,037
Motors	0	0	0	0	$0	$0
End User Behavior	NA	NA	NA	NA	NA	NA
Total	**9,412**	**9,412**	**494**	**494**	**$2,567,905**	**$2,567,905**

Figures 16 through 18 present the same information as Table 8.

FIGURE 16
LOW-INCOME LIFETIME MWH - END-USE

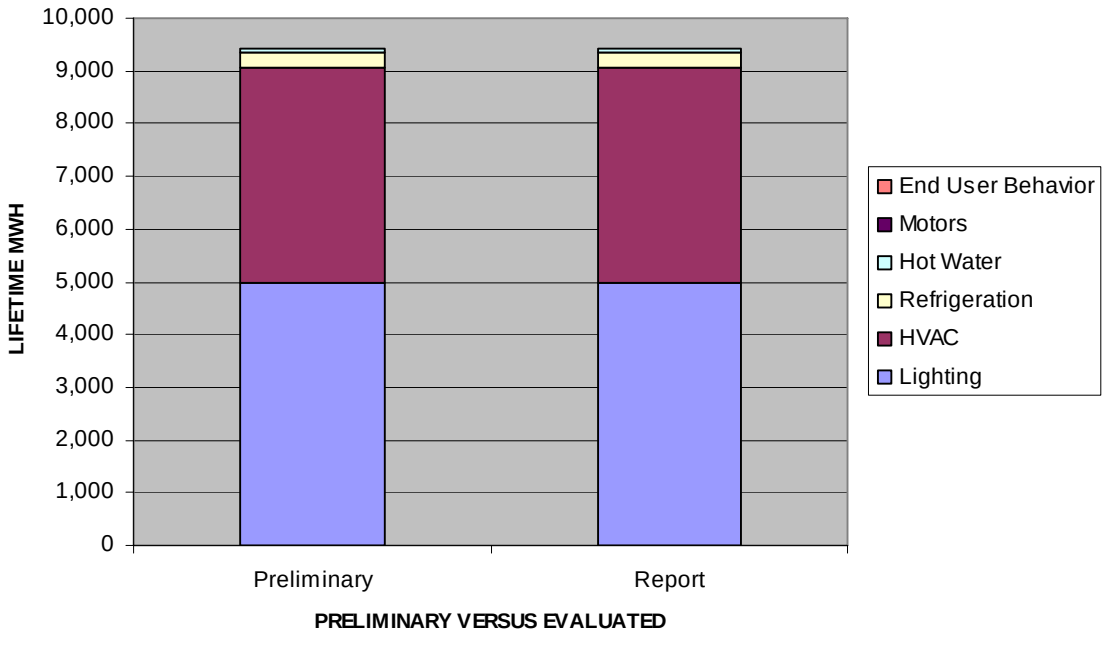
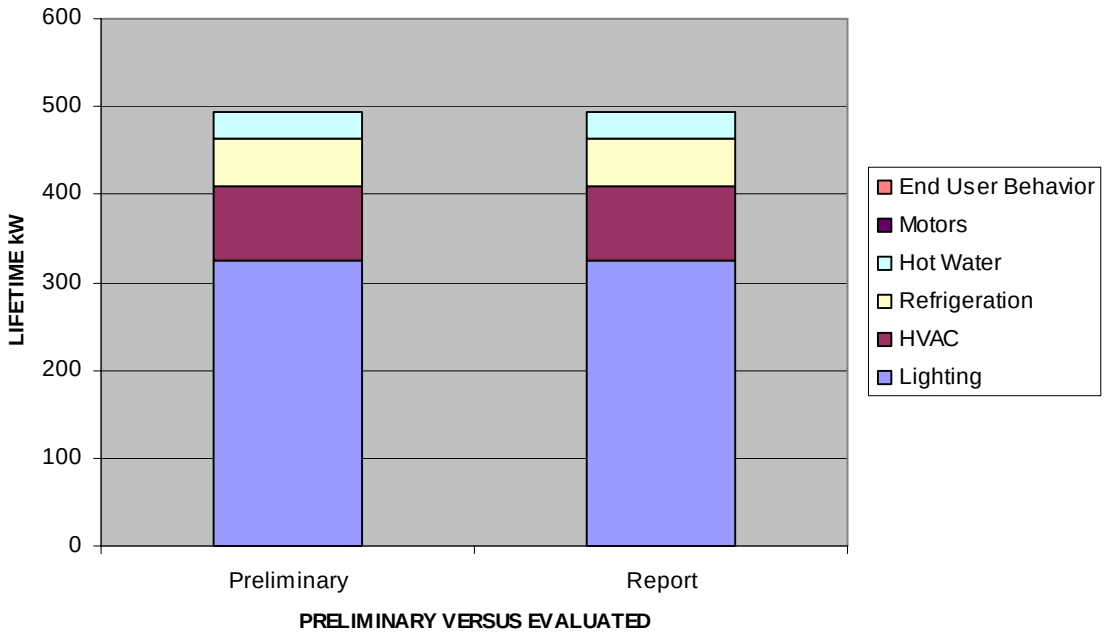
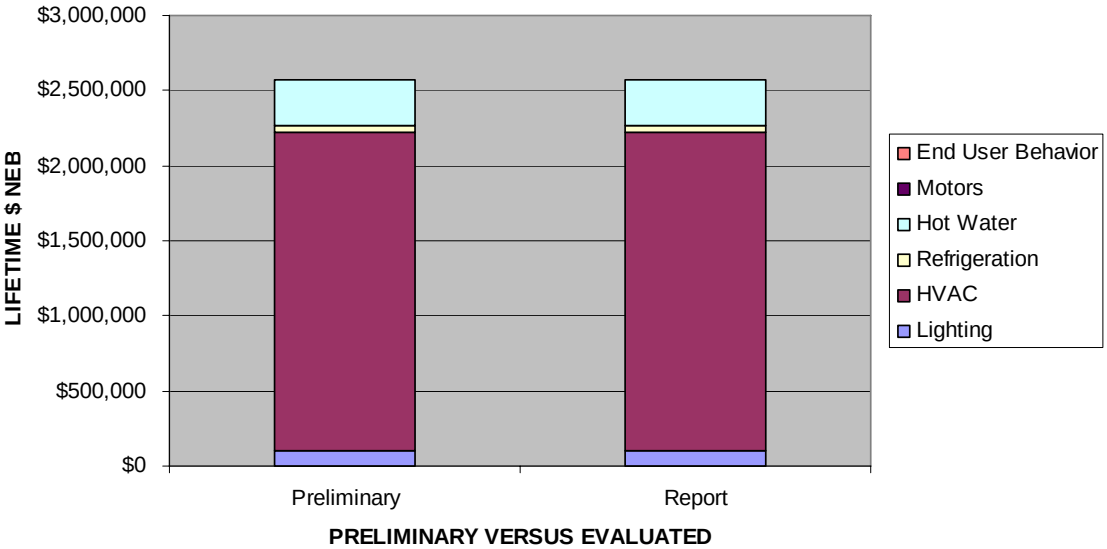


FIGURE 17
LOW-INCOME LIFETIME kW - END-USE



PRELIMINARY VERSUS EVALUATED

FIGURE 18
LOW-INCOME LIFETIME $ NEB - END-USE



PRELIMINARY VERSUS EVALUATED

3. Program Evaluation

No new evaluation activities have been conducted since the 2004 process evaluation of the low income program and the addition, in 2006, of low income non-electric benefits (NEBs) to the estimates of low income multifamily program impacts.

C. Commercial & Industrial

1. By BCR Activity

Table 9 presents a summary of the number of customers served, the annual savings, the lifetime savings, and the costs incurred for the commercial & industrial programs. It also presents the benefit-cost ratio, based on the total resource cost test. The costs and benefits used to derive this ratio are the same as those presented in Table 4.

The Small C&I Retrofit Program contributes the most annual and lifetime energy and capacity savings and non-electric benefits due to high participation in this program. All of the programs are cost-effective.

TABLE 9
IMPACT BY C&I BCR ACTIVITIES

Benefit-Cost Ratio		Annual				Lifetime			Cost		Benefit-Cost
Activity	Participant	kWh	kWh per Customer	kW	$-NEB	MWH	kW	$-NEB	Activity	per Customer	TRC
C02a C&I Lost Opportunity	31	735,008	23,710	181.04	$4,785	10,998	2,708	$71,775	$337,348	$10,882	4.42
C03a Large C&I Retrofit	23	754,391	32,800	322.76	$1,045	10,660	4,673	$13,587	$700,254	$30,446	2.61
C03b Small C&I Retrofit	214	2,267,301	10,595	629.10	$12,715	28,374	7,970	$165,300	$1,752,271	$8,188	2.33
TOTAL	268	3,756,699	14,018	1,132.91	$18,546	50,032	15,351	$250,662	$2,789,873	$10,410	2.65

2. By End Use

Table 10 presents a summary of the lifetime energy savings, capacity savings, and non-electric benefits, by the different end-uses addressed in the commercial & industrial programs.

Most of the energy and capacity savings are obtained primarily from lighting measures and, to a lesser extent, from motors/drives measures. The non-electric benefits in the C&I sector are primarily from reduced O&M costs as a result of efficient light bulbs with longer operating lives.

There is no difference between the evaluated and preliminary results for C&I programs since there were no updates from evaluation studies this year.

TABLE 10 IMPACT BY C&I END-USES						
End Use	Lifetime MWH		Lifetime kW		Lifetime $ NEB	
	Preliminary	Report	Preliminary	Report	Preliminary	Report
Lighting	33,495	33,495	8,589	8,589	$250,663	$250,662
HVAC	2,696	2,696	743	743	$0	$0
Motors / Drives	9,656	9,656	4,965	4,965	$0	$0
Refrigeration	3,637	3,637	997	997	$0	$0
Hot Water	548	548	58	58	$0	$0
Compressed Air	NA	NA	NA	NA	NA	NA
Process	NA	NA	NA	NA	NA	NA
End User Behavior	NA	NA	NA	NA	NA	NA
Total	**50,032**	**50,032**	**15,351**	**15,351**	**$250,663**	**$250,662**

Figures 19 through 21 present the same information as Table 10.

FIGURE 19
C&I LIFETIME MWH - END-USE

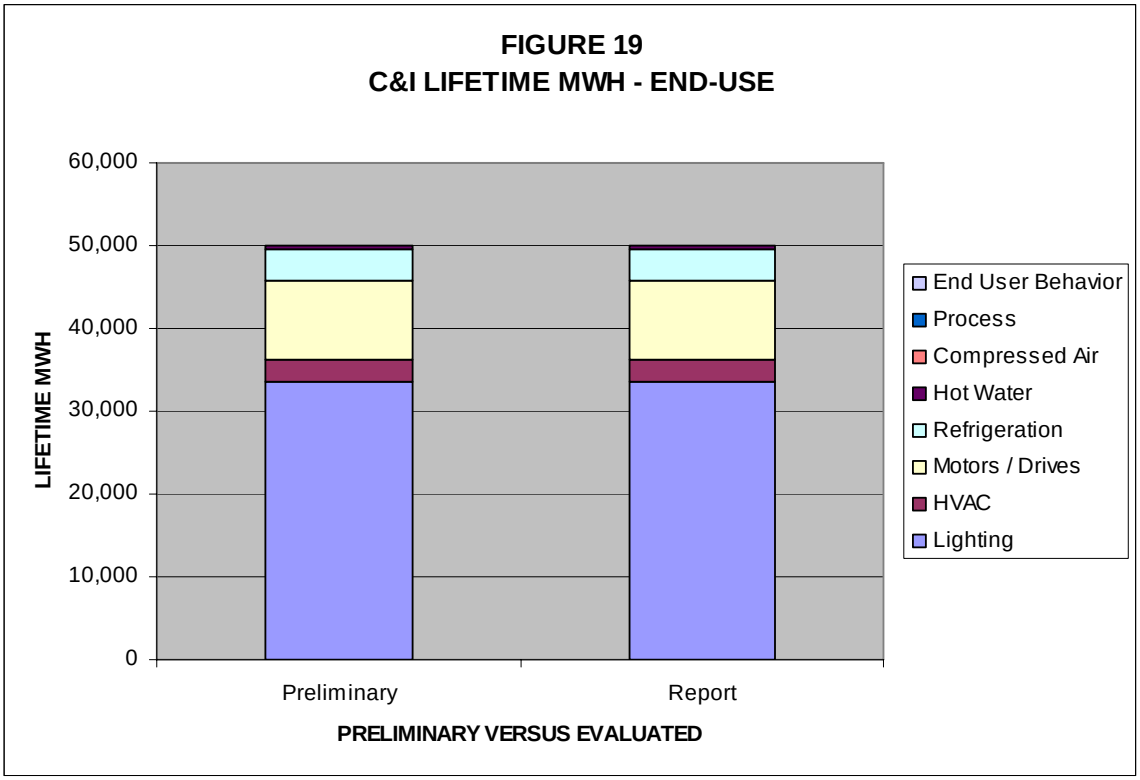


FIGURE 20
C&I LIFETIME kW - END USE

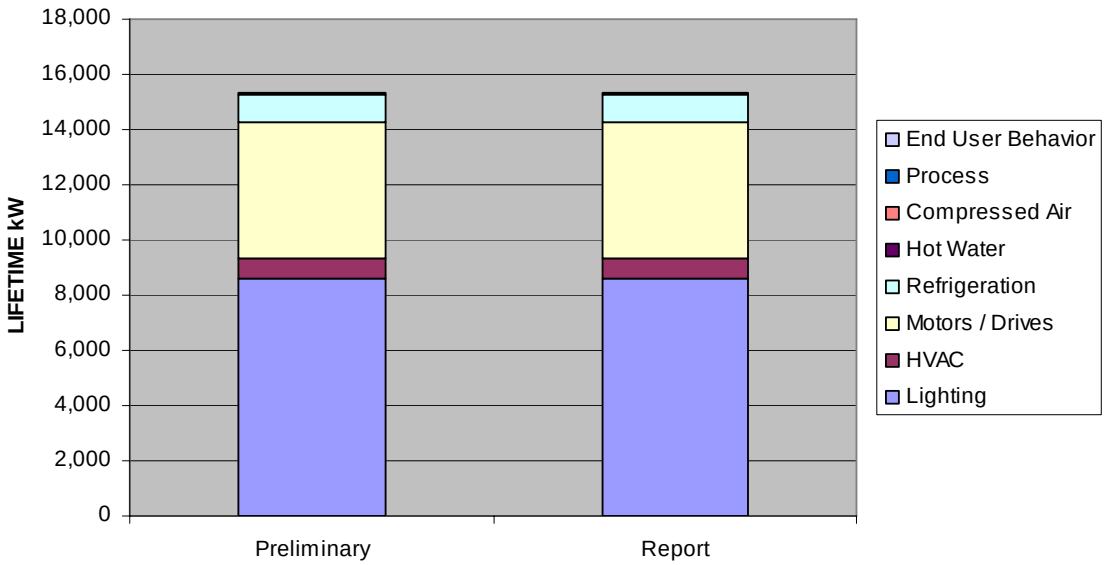
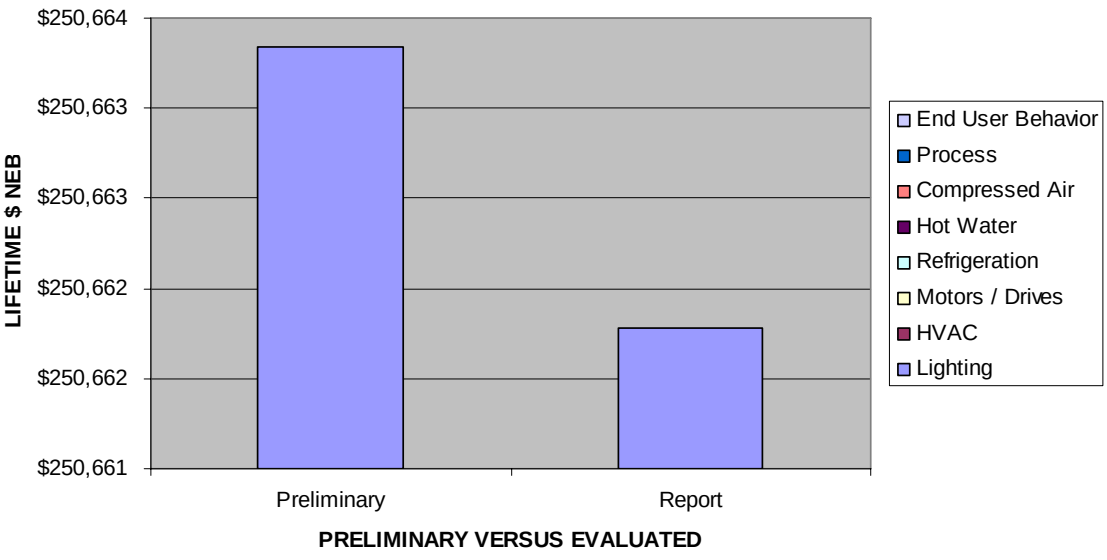


FIGURE 21
C&I LIFETIME $ NEB - END-USE



3. Program Evaluation

The Cape Light Compact conducted no new evaluations pertaining to commercial and industrial programs.

Appendices

Appendix 1. Glossary of Terms and Abbreviations[12]

Annual kWh Reduction	Expected net annual energy savings after all impact factors have been taken into consideration.
AMP	Appliance Management Program
BBRS	Board of Building Regulations and Standards
CAP	Community Action Program
CEE	Consortium for Energy Efficiency
CFL	Compact Fluorescent Lamps
Coincident Peak Demand	Demand for electricity at the time of the Company's peak demand.
Delta Watts	The difference in the wattage between pre-existing or baseline lighting equipment and energy efficient lighting equipment.
Demand	The amount of electric energy used by a customer or a piece of equipment at a specific time, expressed in kilowatts.
Demand Adjustment Factor	This factor is a combination of one or more evaluation impact parameters applied to gross demand savings in the calculation of net demand savings.
Diversity	That characteristic of a variety of electric loads whereby individual maximum demands usually occur at different times.
Diversity Factor	Percent of savings available at the time of the Company's peak demand.
DOE	Department of Energy
DOER	Massachusetts Division of Energy Resources
D&R	D&R International, the contractor to DOE and EPA that monitors sales of ENERGY STAR® appliances.
DSM	Demand Side Management
DTE	Massachusetts Department of Telecommunications and Energy
EFLH	Equivalent Full Load Hours

[12] Much of this glossary was taken from Massachusetts Electric and Nantucket Electric, 2003 Energy Efficiency Annual Report, submitted to the Massachusetts Department of Telecommunications and Energy, September 2004. In addition to this glossary, a glossary completed in March 2009 for the Regional EM&V Forum with additional terms and acronyms is now available at: *http://www.neep.org/EMVinfo.html*

Energy Adjustment Factor	A factor made up of one or more evaluation impact parameters applied to gross kWh savings in the calculation of net kWh savings.
EPA	Environmental Protection Agency
EPACT	Energy Policy Act
ENERGY STAR®	Brand name for the voluntary energy efficiency labeling initiative sponsored by the U.S. Environmental Protection Agency and Department of Energy.
Free Riders	Customers who participate in an energy efficiency program but would have installed the same measure(s) on their own if the program had not been available.
Free-Ridership Rate	The percent of savings attributable to Free Riders.
Gross kW	Expected demand reduction based on a comparison of standard or replaced equipment, and equipment installed through an energy efficiency program.
Gross kWh	Expected kWh reduction based on a comparison of standard or replaced equipment, and equipment installed through an energy efficiency program.
GWh	Gigawatt-hour – a measure of electricity usage over time equal to 1,000 megawatt-hours or 1,000,000 kilowatt-hours.
Hours of Use	The estimated number of hours per year that a measure operates.
Hours of Use Realization Rate	Ratio of actual metered hours of use data to estimated hours of use data.
HP	Horsepower
HVAC	Heating Ventilation and Air Conditioning
Impact Factor	Generic term for persistence, realization rates, in-service rates, non-coincident connected demand factors, etc., developed during the evaluation of energy efficiency programs and used to calculate net savings.
JMC	The Joint Management Committee of utility and non-utility parties that manages the ENERGY STAR® Homes Program.
kWh	Kilowatt-hour – The basic unit of electric energy usage over time. One kWh is equal to one kW of power supplied to a circuit for a period of one hour.
kW	Kilowatt – A measure of electric demand – 1000 watts
kW – Years	See: Lifetime kW
Lifetime	The expected length of time, in years, that an installed measure will be in service and producing savings.
Lifetime kW	The expected demand savings over the lifetime of an

	installed measure, calculated by multiplying the annual peak kW reduction associated with a measure by the expected lifetime of that measure. It is expressed in units of kW-years.
Lifetime MWh	The expected energy savings over the lifetime of an installed measure, calculated by multiplying the annual MWh reduction associated with a measure by the expected lifetime of that measure.
LIHEAP	Low Income Heating Assistance Program
Maximum Annual kW Savings	Peak annual demand savings of a measure. At the program level, this equals the sum of the annual peak demand savings across all measures.
Measure	Specific technology or practice that produces energy and/or demand savings for which the company provides financial incentives.
MPER	Multi-Year Program Evaluation and Market Progress Reporting, or Market Progress and Evaluation Report, developed for various residential programs.
MW	Megawatt – a measure of electric demand equal to 1,000 kilowatts.
MWh	Megawatt-hour – a measure of energy use over time equal to 1,000 kilowatt-hours.
NATE	North American Technician Excellence Program
NEEP	Northeast Energy Efficiency Partnerships
O&M	Operation and Maintenance
Off-Peak energy kWh	The kWh reduction that occurs during the Company's off-peak hours for energy. (Monday-Friday 9 p.m. to 8 a.m. and all day of weekends and holidays)
On-Peak Energy kWh	The kWh reduction that occurs during the Company's on-peak hours for energy. (Monday-Friday 8 a.m. to 9 p.m., except holidays)
Persistence Rate	Percentage of first year energy or demand savings expected to persist over the life of the installed energy efficiency equipment; developed by conducting surveys of installed equipment several years after installation to determine presence and operational capability of the equipment.
RCS	Residential Conservation Services. Formerly Energy Conservation Services or ECS
Seasonal (Winter/Summer) kW	The net demand reduction during either the Winter or Summer seasons.
Spillover	Additional energy efficient equipment installed by customers

	that were influenced by the Company's sponsored program, but without direct financial or technical assistance from the program. Spillover is separated into Participant and Non-participant factors. Non-participating customers may be influenced by product availability, publicity, education, and other factors that are affected by the program.
Spillover Rate	Estimate of energy savings attributable to spillover effects expressed as a percent of savings installed by participants through an energy efficiency program.
VSD	Variable Speed Drive
WAP	Weatherization Assistance Program
Watt	The basic electrical unit of power.

Appendix 2. 2008 Evaluation Impact Parameters

The table below presents the impact factors that were used to calculate the evaluated savings for the Commercial & Industrial programs in 2008. Commercial & Industrial impact factors were not evaluated in 2008.

Table A2.1 Commercial & Industrial Program Evaluation Impact Factors

BCR Activity	Program	End Use	Measure Life	Free Ridership Rate	Spillover [Participant] Rate	Spillover [Non-Participant] Rate	In-Service Rate
C02a C&I Lost Opportunity	C02a C&I New Construction	ALght	15	13.00%	0.00%	2.60%	100%
C02a C&I Lost Opportunity	C02a C&I New Construction	BHVAC	15	14.80%	5.90%	2.60%	100%
C02a C&I Lost Opportunity	C02a C&I New Construction	CMoDr	20	100.00%	0.00%	2.60%	100%
C02a C&I Lost Opportunity	C02b C&I Govt New Construction	ALght	15	0.00%	0.00%	2.60%	100%
C03a Large C&I Retrofit	C03a C&I Large Retrofit	ALght	13	35.20%	0.70%	2.60%	100%
C03a Large C&I Retrofit	C03a C&I Large Retrofit	BHVAC	12	12.50%	5.20%	2.60%	100%
C03a Large C&I Retrofit	C03a C&I Large Retrofit	CMoDr	15	19.30%	0.00%	2.60%	100%
C03a Large C&I Retrofit	C03c C&I Govt Large	BHVAC	12	0.00%	0.00%	2.60%	100%
C03a Large C&I Retrofit	C03c C&I Govt Large	CMoDr	15	0.00%	0.00%	2.60%	100%
C03a Large C&I Retrofit	C03c C&I Govt Large	DRefr	13	0.00%	0.00%	2.60%	100%
C03b Small C&I Retrofit	C03b C&I Small Retrofit	ALght	13	7.70%	0.30%	2.60%	86%
C03b Small C&I Retrofit	C03b C&I Small Retrofit	BHVAC	10	2.10%	25.40%	2.60%	100%
C03b Small C&I Retrofit	C03b C&I Small Retrofit	CMoDr	15	0.00%	0.00%	2.60%	100%
C03b Small C&I Retrofit	C03b C&I Small Retrofit	DRefr	10	7.80%	0.40%	2.60%	100%
C03b Small C&I Retrofit	C03b C&I Small Retrofit	EHoWa	10	0.00%	0.00%	2.60%	100%
C03b Small C&I Retrofit	C03d C&I Govt Small	ALght	13	0.60%	3.40%	2.60%	89%
C03b Small C&I Retrofit	C03d C&I Govt Small	BHVAC	10	0.00%	0.00%	2.60%	100%
C03b Small C&I Retrofit	C03d C&I Govt Small	CMoDr	15	0.00%	0.00%	2.60%	100%
C03b Small C&I Retrofit	C03d C&I Govt Small	DRefr	10	0.00%	0.00%	2.60%	100%
C02a C&I Lost Opportunity	C04c C&I Products & Services	ALght	15	27.90%	13.40%	2.60%	100%
C02a C&I Lost Opportunity	C04c C&I Products & Services	BHVAC	13	14.80%	5.90%	2.60%	100%
C02a C&I Lost Opportunity	C04c C&I Products & Services	CMoDr	15	28.80%	9.20%	2.60%	100%

Note: Shaded cells indicate impact factors that are neither 100% for the In-Service Rate nor 0% for the Free Ridership, Participant Spillover, or Non-Participant Spillover Rates.

The table below presents the impact factors that were used to calculate the evaluated savings for residential programs offered by the Cape Light Compact in 2008. Impact factors shown below for most programs represent the common assumptions developed by Massachusetts program administrators, based on a review of best available information on measures in statewide programs. The Residential Lighting program impact factors in bold were updated in 2008.

Table A2.2 Residential Program Evaluation Impact Factors

BCR Activity	Measure	Measure Life	Free Ridership Rate	Spillover [Participant] Rate	Spillover [Non-Participant] Rate	In-Service Rate
A02a Residential Lost Opportunity	CFL	7	2.00%	0.00%	0.00%	90%
A02a Residential Lost Opportunity	HERSC	25	0.00%	0.00%	0.00%	100%
A02a Residential Lost Opportunity	HERSD	15	0.00%	0.00%	0.00%	100%
A02a Residential Lost Opportunity	HERSS	25	0.00%	0.00%	0.00%	100%
A02a Residential Lost Opportunity	HERSCCP	25	0.00%	0.00%	0.00%	100%
A02a Residential Lost Opportunity	HERSDCP	15	0.00%	0.00%	0.00%	100%
A02a Residential Lost Opportunity	HERSSCP	25	0.00%	0.00%	0.00%	100%
A02a Residential Lost Opportunity	LIHERSC	25	0.00%	0.00%	0.00%	100%
A02a Residential Lost Opportunity	LIHERSD	15	0.00%	0.00%	0.00%	100%
A02a Residential Lost Opportunity	LIHERSS	25	0.00%	0.00%	0.00%	100%
A02a Residential Lost Opportunity	LIHERSCCP	25	0.00%	0.00%	0.00%	100%
A02a Residential Lost Opportunity	LIHERSDCP	15	0.00%	0.00%	0.00%	100%
A02a Residential Lost Opportunity	LIHERSSCP	25	0.00%	0.00%	0.00%	100%

BCR Activity	Measure	Measure Life	Free Ridership Rate	Spillover [Participant] Rate	Spillover [Non-Participant] Rate	In-Service Rate
A03a Residential Retrofit 1-4	CFL	7	2.00%	0.00%	0.00%	90%
A03a Residential Retrofit 1-4	Torchiere	8	0.00%	0.00%	0.00%	100%
A03a Residential Retrofit 1-4	BOILRWATER	20	0.00%	0.00%	0.00%	100%
A03a Residential Retrofit 1-4	ECM HEAT (CLC-specific)	18	15.00%	0.00%	0.00%	100%
A03a Residential Retrofit 1-4	Refrigerator (retirement value)	1	35.00%	36.00%	0.00%	100%
A03a Residential Retrofit 1-4	Refrigerator (energy star value)	13	35.00%	36.00%	0.00%	100%
A03a Residential Retrofit 1-4	Insulation, Oil	25	2.00%	0.00%	0.00%	100%
A03a Residential Retrofit 1-4	Insulation, Gas	25	2.00%	0.00%	0.00%	100%
A03a Residential Retrofit 1-4	Insulation, Electric	25	2.00%	0.00%	0.00%	100%
A03a Residential Retrofit 1-4	Insulation, Other Fuels	25	2.00%	0.00%	0.00%	100%
A03a Residential Retrofit 1-4	Air Sealing, Oil	15	2.00%	0.00%	0.00%	100%
A03a Residential Retrofit 1-4	Air Sealing, Gas	15	2.00%	0.00%	0.00%	100%
A03a Residential Retrofit 1-4	Air Sealing, Electric	15	2.00%	0.00%	0.00%	100%
A03a Residential Retrofit 1-4	Air Sealing, Other Fuels	15	2.00%	0.00%	0.00%	100%
A03a Residential Retrofit 1-4	TSTATS	10	2.00%	0.00%	0.00%	100%
A03a Residential Retrofit 1-4	Heating System Replacement, Oil	18	0.00%	0.00%	0.00%	100%
A03a Residential Retrofit 1-4	Heating System Replacement, Other Fuels	18	0.00%	0.00%	0.00%	100%
A03a Residential Retrofit 1-4	BOILER RESET CONTROLS	15	0.00%	0.00%	0.00%	100%
A03a Residential Retrofit 1-4	Indirect Water Heater, Oil	20	0.00%	0.00%	0.00%	100%
A03a Residential Retrofit 1-4	Solar Hot Water, Electric	25	0.00%	0.00%	0.00%	100%
A03a Residential Retrofit 1-4	DHW ISMs, Oil	7	2.00%	0.00%	0.00%	100%
A03a Residential Retrofit 1-4	DHW ISMs, Electric	7	2.00%	0.00%	0.00%	100%
A03a Residential Retrofit 1-4	WINDOWS	25	0.00%	0.00%	0.00%	100%

BCR Activity	Measure	Measure Life	Free Ridership Rate	Spillover [Participant] Rate	Spillover [Non-Participant] Rate	In-Service Rate
A04a Residential Lighting	CFL - Markdown	**7**	0.00%	0.00%	0.00%	**97%**
A04a Residential Lighting	CFL - Coupon	**5**	**6.00%**	**25.00%**	0.00%	**84%**
A04a Residential Lighting	Indoor Fixture	20	8.00%	4.00%	0.00%	**76%**
A04a Residential Lighting	Outdoor Fixture	6	12.00%	7.00%	0.00%	**52%**
A04a Residential Lighting	Torchiere	8	6.00%	3.00%	0.00%	**33%**
A04b Residential Appliances	AC (retirement value)	4	0.00%	0.00%	0.00%	100%
A04b Residential Appliances	AC (energy star value)	11	0.00%	0.00%	0.00%	100%
A04b Residential Appliances	AC (retirement value) turn-in	4	0.00%	0.00%	0.00%	100%
A04b Residential Appliances	AC (energy star value) turn-in	11	0.00%	0.00%	0.00%	100%
A04b Residential Appliances	CLOTHESWASHERS	11	10.00%	0.00%	0.00%	27%
A04b Residential Appliances	Dehumidifiers (retirement value) turn-in	4	0.00%	0.00%	0.00%	100%
A04b Residential Appliances	Dehumidifiers (energy star value) turn-in	12	0.00%	0.00%	0.00%	100%

Note: Shaded cells indicate impact factors that are neither 100% for the In-Service Rate nor 0% for the Free Ridership, Participant Spillover, or Non-Participant Spillover Rates.

The table below presents the impact factors that were used to calculate the evaluated savings for low income programs offered by the Cape Light Compact in 2008. Impact factors shown below for most programs represent the common assumptions developed by Massachusetts program administrators, based on a review of best available information on measures in statewide programs. Low Income impact factors were not evaluated in 2008.

Table A2.3 Low Income Program Evaluation Impact Factors

BCR Activity	Measure	Measure Life	Free Ridership Rate	Spillover [Participant] Rate	Spillover [Non-Participant] Rate	In-Service Rate
B03a Low-Income Retrofit 1-4	AIRSEAL - electric	15	0.00%	0.00%	0.00%	100%
B03a Low-Income Retrofit 1-4	AIRSEAL - oil	15	0.00%	0.00%	0.00%	100%
B03a Low-Income Retrofit 1-4	AIRSEAL - gas	15	0.00%	0.00%	0.00%	100%
B03a Low-Income Retrofit 1-4	INSULATION - electric	25	0.00%	0.00%	0.00%	100%
B03a Low-Income Retrofit 1-4	INSULATION - gas	25	0.00%	0.00%	0.00%	100%
B03a Low-Income Retrofit 1-4	INSULATION - oil	25	0.00%	0.00%	0.00%	100%
B03a Low-Income Retrofit 1-4	Heating System Retrofit	18	0.00%	0.00%	0.00%	100%
B03a Low-Income Retrofit 1-4	CFL's	16	0.00%	0.00%	0.00%	100%
B03a Low-Income Retrofit 1-4	Torchiere	8	0.00%	0.00%	0.00%	100%
B03a Low-Income Retrofit 1-4	Refrigerator (retirement value)	1	0.00%	0.00%	0.00%	100%
B03a Low-Income Retrofit 1-4	Refrigerator (energy star value)	13	0.00%	0.00%	0.00%	100%
B03a Low-Income Retrofit 1-4	DHWater Measure (elec)	7	0.00%	0.00%	0.00%	100%
B03a Low-Income Retrofit 1-4	DHWater Measure (gas&other)	7	0.00%	0.00%	0.00%	100%
B03a Low-Income Retrofit 1-4	WINDOWS	25	0.00%	0.00%	0.00%	100%
B03b Low-Income Retrofit Multifamily	Refrigerator (retirement value)	1	0.00%	0.00%	0.00%	100%
B03b Low-Income Retrofit Multifamily	Refrigerator (energy star value)	13	0.00%	0.00%	0.00%	100%
B03b Low-Income Retrofit Multifamily	WINDOWS	25	0.00%	0.00%	0.00%	100%
B03b Low-Income Retrofit Multifamily	Insulation & Air Sealing - electric	25	0.00%	0.00%	0.00%	100%

Note: Shaded cells indicate impact factors that are neither 100% for the In-Service Rate nor 0% for the Free Ridership, Participant Spillover, or Non-Participant Spillover Rates.

Appendix 3. Post Program Savings Attributed to Selected 2008 Market Transformation Initiatives

The Compact has not developed estimates of post program savings associated with market transformation initiatives. It is our understanding that this issue has not been considered a high priority for DOER or other Program Administrators.

Appendix 4. Calculation of Shareholder Incentive

The Cape Light Compact does not require shareholder incentives to implement its energy efficiency programs. Therefore, this section is not relevant to the Compact.

Appendix 5. Summary of 2008 Energy Efficiency Evaluation Reports

The following studies were used in preparing the evaluated results presented in this Annual Report. The executive summaries of these reports are attached below. The full copies of these reports are available from the Compact upon request.

- Evaluation of the Massachusetts New Homes with ENERGY STAR 2008 Findings and Analysis" by Nexus Market Research and Dorothy Conant, July 2, 2009.
- The Massachusetts New Homes with ENERGY STAR Program 2008 Progress Report, by Dorothy Conant, July 6, 2009
- Residential Lighting Markdown Impact Evaluation by Nexus Market Research, RLW Analytics, Inc, and GDS Associates, January 20, 2009
- Massachusetts Residential Appliance Saturation Survey, FINAL, by Opinion Dynamics Corporation, April 2009

Evaluation of the Massachusetts New Homes with ENERGY STAR® Program

2008 Findings and Analysis

Final Report

Executive Summary

July 2, 2009

Submitted to:

Joint Management Committee

Submitted by:

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Executive Summary

This document summarizes the evaluation work completed on the Massachusetts New Homes with ENERGY STAR® Program run by the Joint Management Committee (JMC) in Massachusetts for 2008. Individual evaluation reports on which the findings and analysis contained in this document are based are included as appendices. The evaluation work conducted for the 2008 Program includes:

- PRISM billing analyses of homes built through the Program in 2006 and 2007 providing adjustment factors for both the User-defined Reference Home (UDRH) and the as-built ENERGY STAR-qualified home that may be applied to Beacon software-based estimates of energy usage in order to calculate energy savings from the Program. (Billing Analyses, Appendix A)
- Estimation of the value to homeowners of seven non-energy impacts (NEIs) of ENERGY STAR homes using a survey of 70 homeowners who have purchased ENERGY STAR-qualified homes over the past two years, and in-depth interviews with 30 builders who participated in the Program in 2008. (NEI Analysis, Appendix B)
- Interviews with 30 ENERGY STAR builders who participated in the free Compact Fluorescent Lamp (CFL) component of the Program in 2008 assessing the builders' experience selecting, ordering and installing CFLs on their own rather than having HERS raters do installations as well as the impact of the 2008 protocol on the number and type of CFLs installed. (CFL Process, Appendix C)
- Interviews with the 30 ENERGY STAR builders who participated in the free CFL component of the Program assessing their satisfaction with the Program, marketing ENERGY STAR homes, choosing a HERS rater and Program training offerings with comparisons to findings from 2007 interviews. (Builder Interviews, Appendix D)

Program Overview

The Massachusetts New Homes with ENERGY STAR Program qualified more than 980 housing units in 2008, bringing the total number of housing units ENERGY STAR qualified since Program inception to more than 14,300. The total number of housing units ENERGY STAR qualified in 2008 is 23% lower than in 2007, the number of total building permits issued in Massachusetts in 2008 is 36% lower and the estimated number of housing units completed in Massachusetts in 2008 is 33% lower. With the number of statewide completed housing units falling more sharply than the number of homes qualified, the penetration of ENERGY STAR housing units climbed. The estimated percentage of new housing units completed in Massachusetts that are ENERGY STAR qualified increased from 9% in 2007 to 10% in 2008, the penetration of single family ENERGY STAR homes climbed from 7% to 10%, and the penetration of multi-family ENERGY STAR units fell from 14% to 11%.

Conclusions

Evaluations of the 2008 Program covered relatively diverse areas—adjustment factors from billing analysis, valuation of NEIs, and review of the CFL installation process. These evaluations do, nonetheless, point to several overall conclusions and recommendations.

The recession and housing market decline of 2008 has, not surprisingly, had significant effects on the Program. The number of ENERGY STAR homes qualified dropped, even as the penetration of ENERGY STAR housing increased, reflecting a much sharper percentage drop in the estimated number of housing units completed statewide than in the number of ENERGY STAR-qualified housing units built. However, 2008 also saw increases in the builders' and, likely, the homeowners' perceptions of the value of having the ENERGY STAR label on a home. More specifically,

- The builders' perception of the value of having the ENERGY STAR label on a home has increased with almost all (93%) of interviewed builders saying that building ENERGY STAR homes and being able to market them as ENERGY STAR qualified is very (70% of builders) or somewhat (23% of builders)valuable in today's housing market. This is a marked improvement from 2007 when 78% of builders called for the Program to conduct more consumer marketing because of low homebuyer interest in ENERGY STAR homes.
- While homeowner awareness of ENERGY STAR homes was not directly measured in 2008, over one-half (57%) of interviewed builders say awareness of and/or interest in buying ENERGY STAR homes has increased, and the percentage of builders saying almost all homebuyers are aware of ENERGY STAR homes doubled from 5% in 2007 to 10%.
- Homeowners who know they have bought ENERGY STAR homes place high values on non-energy impacts (NEIs) with close to nine out of ten believing their homes offer more thermal comfort than other new homes and valuing this feature, on average, almost as much as yearly energy bill savings. Homeowners also place a high value on energy bill protection—a feature they say they largely figure out on their own.

The Program's steps toward a market-driven model, having builders chose their own HERS raters and giving them the option to select and install CFLs themselves, also appear to be working well. More specifically,

- Builders like being able to choose their HERS rater. Most builders stayed with the HERS raters they were assigned in 2007; the 14% of interviewed builders who opted to change HERS raters have successfully selected and established good working relationships with different raters.

- A majority (55%) of the 22 interviewed builders who have installed free CFLs under both the old and new processes like selecting, ordering and installing the free CFLs themselves better than having their HERS rater select and install the CFLs, since under the new process the builders are able to install the CFLs on their schedule, typically at the same

time the lighting fixtures are installed. Just over one-fourth (27%) prefer having their HERS raters select and install CFLs and 18% are indifferent, saying both processes work equally well.

- Listing marketing support offerings on the application form and asking builders to check the options they are interested in is very likely a factor contributing to the likelihood of builders taking advantage of available marketing support. The percentage of interviewed builders taking advantage of available marketing support options increased from 18% of builders interviewed in 2007 to 50% of builders interviewed in late 2008 and early 2009.

Recommendations

The overall conclusions of the 2008 evaluations lead to several recommendations aimed at maintaining the Program's effectiveness as it continues its transition to a market-based model in a recessionary housing market. Several recommendations deal with marketing the Program.

- **Continue marketing the Program to consumers** to increase homebuyer awareness of and interest in the importance of energy efficiency and the benefits of buying and living in an ENERGY STAR home.
- **Continue to encourage builders to take advantage of marketing support available through the Program.** In particular, encourage all participating builders to display ENERGY STAR signs at their projects—signs are relatively inexpensive and builders say the signs bring in customers and make it more likely they will ask about what goes into building an ENERGY STAR home.
- **Produce more case studies appropriate for use in marketing to builders and homebuyers.** There are now several builders saying they have homebuyers coming to them looking for an ENERGY STAR home and several builders saying buyers are very happy with the low operating cost of their ENERGY STAR homes.
- **NEIs should be an integral part of marketing for ENERGY STAR homes.** Builders should be especially encouraged to talk to prospective buyers about noise reduction, indoor air quality, and safety (or make sure their salespeople do so). Consider sharing some of the results of the NEI study with builders, in particular to show them the differences between home buyers' ratings of NEI values compared to how builders think buyers would rate them.

It is also important to maintain flexibility and prepare for future developments.

- **The Program's plan going forward to give builders the option of selecting, ordering and installing the free CFLs themselves or having their HERS rater select and install them is a good step.** With the Program now requiring builders to install CFLs in at least 50% of all hard-wired screw-based fixtures, offering both approaches allows experienced ENERGY STAR builders who are comfortable selecting CFLs on their own and prefer having the CFLs on site to install when the light fixtures are installed to do so.

Builders who are new to the Program or who are not very knowledgeable about the variety of CFLs available or which ones work best in specific applications will benefit from having their HERS raters choose and install the CFLs. Offering both processes will likely maximize the number of CFLs installed through the Program.

- **Start planning for training builders to meet ENERGY STAR 2011 requirements.** Educating builders in 2009 about changes likely to be implemented in 2011 and assuring them that in 2010 the Program will provide the training needed to ensure they can meet the new requirements will help maintain builder participation and the increasing penetration rate of ENERGY STAR homes in the market.

The Massachusetts New Homes with ENERGY STAR® Program

2008 PROGRESS REPORT

FINAL REPORT

Date July 6, 2009

Submitted to:

The Massachusetts New Homes with ENERGY STAR Program

Joint Management Committee

Submitted by:

Dorothy Conant, Consultant

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1 Introduction

The annual Massachusetts New Homes with ENERGY STAR® Program 2008 Progress Report is a summary of 2008 Program activity. Program performance information includes historical as well as current information to show the growth of the Program over time.

1.1 Metrics

There were two residential new construction metrics for 2008. The Program achieved the exemplary level for both metrics

1.1.1 Zero Energy Home Demonstration Project

Threshold: Develop and provide a pilot design for Zero Net Energy Homes. Include renewable energy, innovative technologies and products, and 'best practice' HVAC installations. Provide incentives, comprehensive technical assistance, and other appropriate support to encourage builders to participate. The maximum modeled energy performance rating of homes will be HERS index 35 or better.

Design: Recruit at least three builders to participate in the pilot with at least one of their homes. Builders will sign an MOU indicating their intention to participate and agreeing that all participating homes are scheduled to be substantially completed by December 31, 2009.

Exemplary–Achieved: One of the participating pilot homes is considered "affordable", using the HUD income guidelines (80% of area median income). Provide a pilot status update memo documenting 2008 pilot accomplishments.

1.1.2 Support Residential New Construction Code development

Threshold: Develop a strategy to examine and pursue options for adopting a residential energy code at least as stringent as the national ENERGY STAR Homes standard in Massachusetts municipalities, and facilitate one introductory meeting among communities.

Design: Encourage at least three municipalities to pursue the adoption of an ENERGY STAR equivalent code and support the process toward adoption in each municipality.

Exemplary–Achieved: For at least one municipality, provide the technical specifications and support necessary so the town could develop an ordinance and/or law that will put in place a building code at least as stringent as the national ENERGY STAR Homes standard.

2 Over the Years

The figures on the following pages show historical data on housing permits issued, housing units recruited, housing units Energy star qualified, and the Program's achievements since 1999. They show the number of housing units recruited each year, the average HERS ratings of homes completed in each year, the average cost per signed housing unit and per completed housing unit each year, and completed housing units each year as a percentage of estimated total annual housing units completed in Massachusetts. As these figures will show, while the number of housing permits issued and the number of housing units completed in 2008 are both lower than in 2007, the number of new housing units signed in 2008 is more than twice as high. Also, despite the drop in the number of homes completed through the Program in 2008, completed ENERGY STAR-qualified homes increased their share of estimated homes completed statewide. As of the end of 2008, the Program has completed over 14,300 ENERGY STAR-qualified housing units.

2.1 Massachusetts Housing Permits

The numbers of both single family and multi-family permits issued in Massachusetts fell for the third year in a row. Single family permits issued in 2008, at 5,368 permits, are at their lowest level during the 1980 to 2008 period. (Figure 2-1) Annual multi-family permits issued, which grew consistently from 2002 through 2005, also dropped in each of the last three years, but remain above 1990 through 2002 levels. Compared to 2005, the number of total permits issued in 2008 is down by 59%, the number of single family permits issued is down by 62% and the number of multi-family permits issued is down by 55%.

Figure 2-1: Massachusetts Housing Permits Issued 1980 – 2008

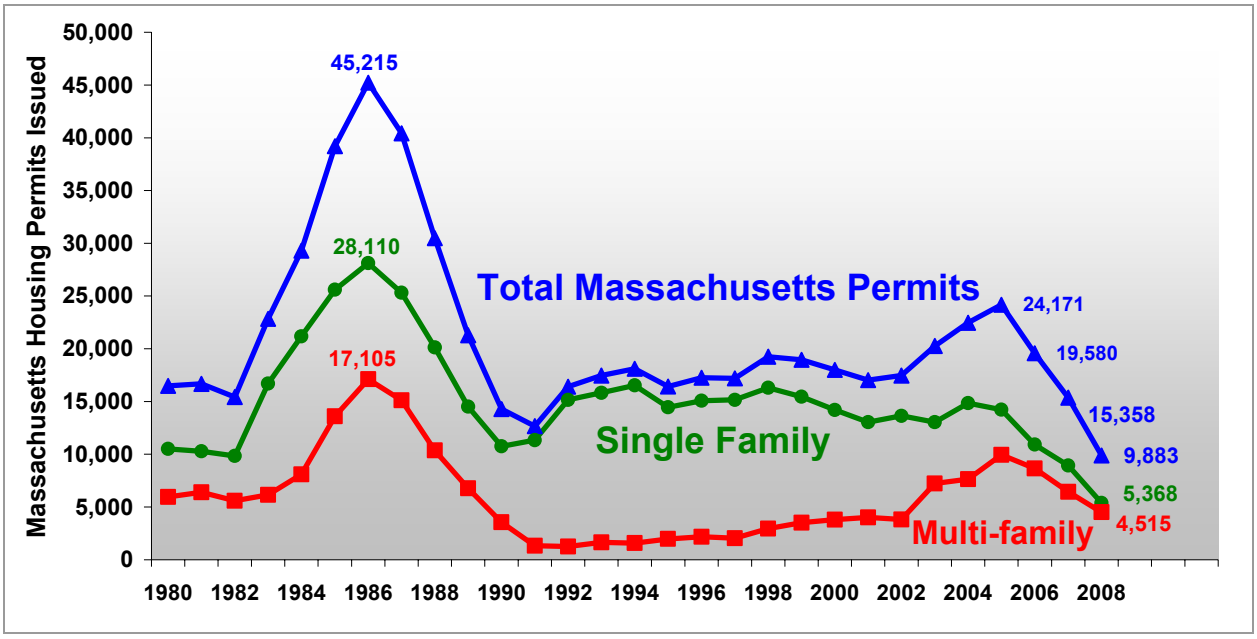


Figure 2-2, Figure 2-3, and Figure 2-4 show year-to-date total, single family and multi-family permits issued from 2002 through May 2009.[1] Total permits issued in 2008 are 36% lower, single family permits 40% lower and multi-family permits 30% lower than in 2007. Total permits issued January through May 2009 are 31% lower, single family permits 34% lower and multi-family permits 27% lower than in the first five months of 2008.

Figure 2-2: Year-to-Date Total Permits Issued 2002 – 2009

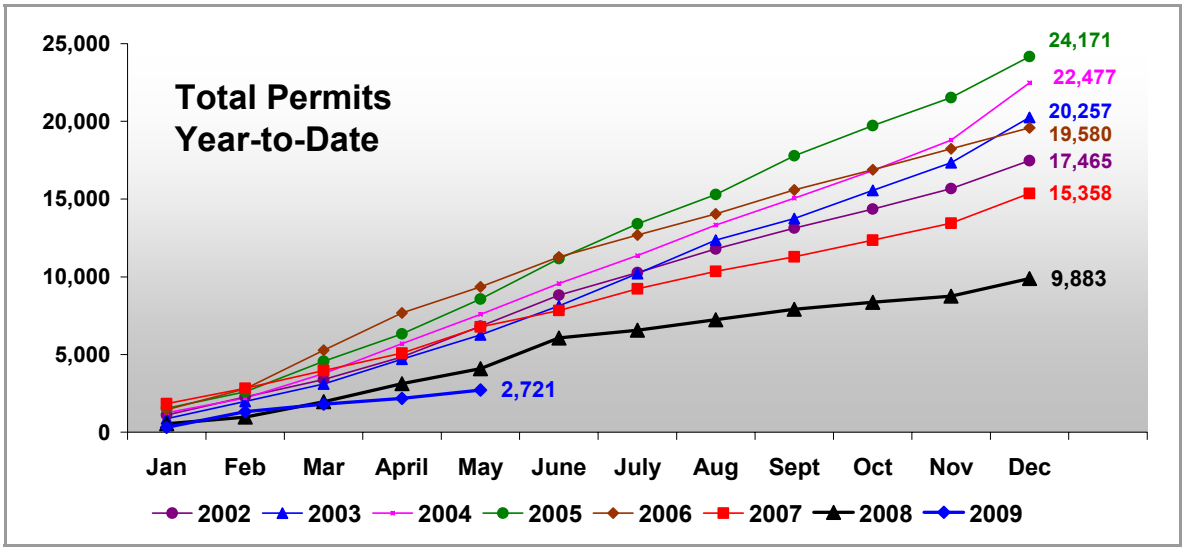
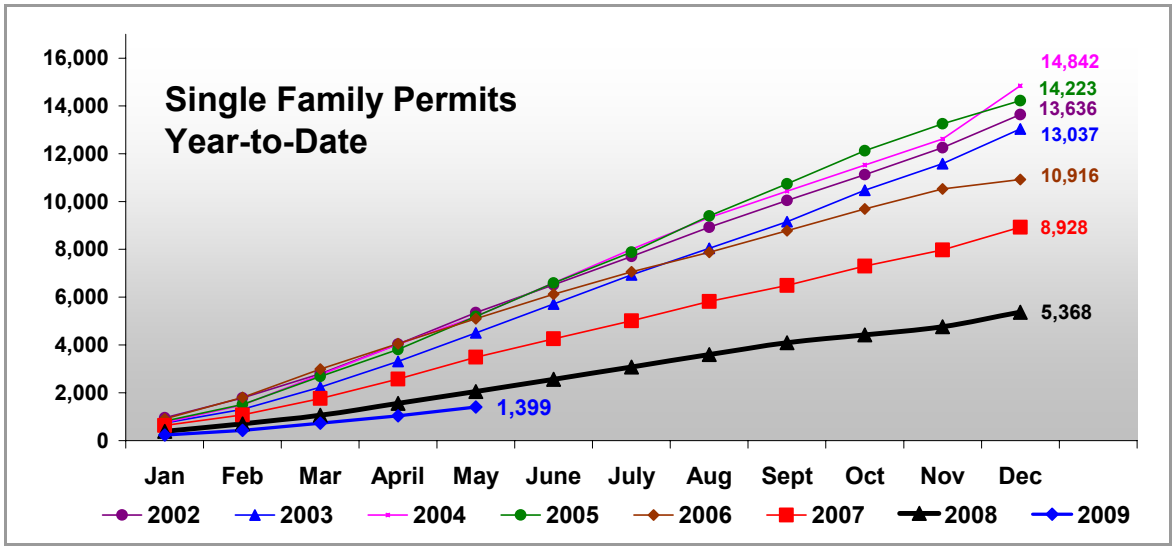
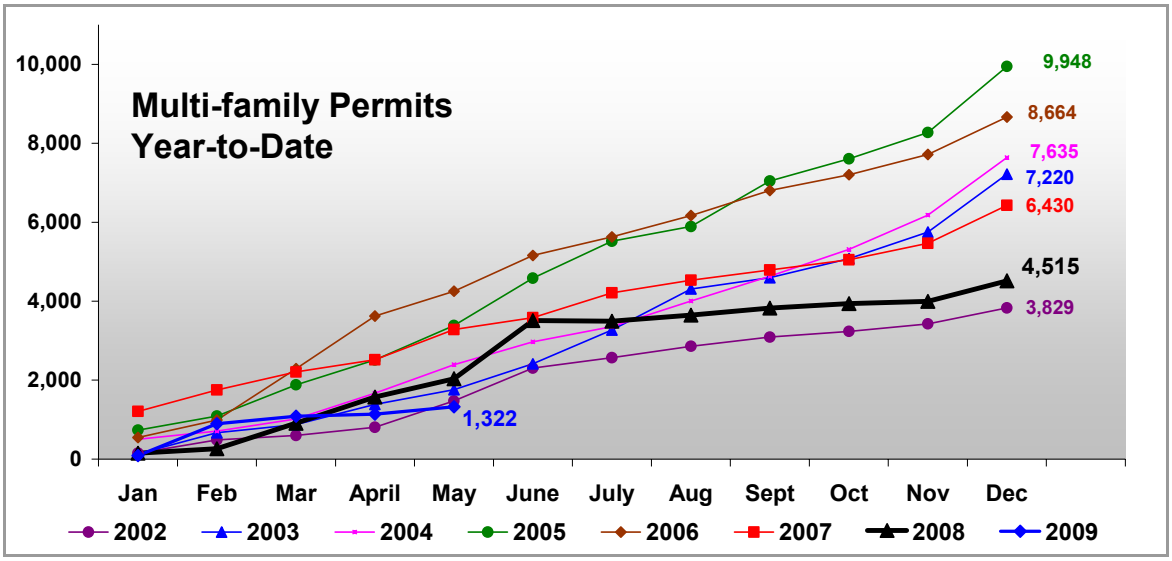


Figure 2-3: Year-to-Date Single family Permits Issued 2002 – 2009



[1] Total permits for each year are the final revised annual totals which may be higher or lower than the published December year-to-date totals.

Figure 2-4: Year-to-Date Multi-family Permits Issued 2002 – 2009

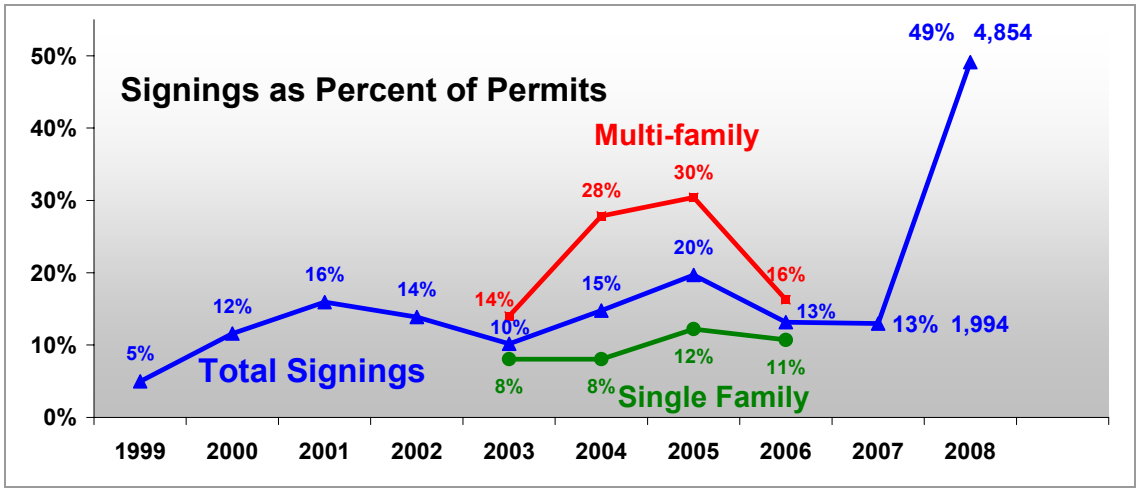


2.2 Annual Signed Housing Units

2.2.1 Recruited Housing Units Compared to Statewide Permits Issued

Figure 2-5 shows new housing units recruited to participate in the Program as a percentage of all housing permits issued in the state climbed sharply in 2008—from 13% in 2007 to 49% in 2008. The number of housing units signed in 2008 is almost two and a half times the number signed in 2007. Prior to 2006, signings include only housing units signed and committed to being built to ENERGY STAR standards; 2006 signings include both ENERGY STAR and Energy Measure Upgrade (EMU) housing units; 2007 and 2008 signings include both ENERGY STAR and Code Plus housing units. From 2003 through 2006 signings were tracked by housing type—single family or multi-family; for 2007 and 2008 no breakdown of signings by housing type is available.

Figure 2-5: Annual Signed Housing Units as Percent of Statewide Permits



2.3 Participating Housing Units as Percentage of Statewide Completed Housing Units

Figure 2-6 on the following page shows the number of housing units completed through the Program each year. Figure 2-7 shows annual ENERGY STAR housing units qualified each year through the Program as a percentage of estimated total annual completed housing units in Massachusetts. From 1999 through 2006 both the number of housing units qualified through the Program and their percentage of estimated statewide completed housing units increased each year, peaking in 2006 at 2,610 housing units and 16% of the market. In 2007, both the number of total housing units qualified and their share of total estimated housing units completed in Massachusetts dropped sharply. In 2008, the number of total housing units ENERGY STAR qualified fell farther, by 300 housing units or 23%. However, completed ENERGY STAR housing units as a percentage of estimated total housing units completed in Massachusetts climbed from 9% in 2007 to 10% in 2008, reflecting a sharper drop in estimated statewide home completions (33%) than in ENERGY STAR-qualified home completions (23%). Using Census Bureau definitions of single family and multi-family housing[2], the number of single family homes ENERGY STAR qualified fell by 75 homes or 10% in 2008, while their share of estimated statewide single family homes completed in Massachusetts climbed from 7% in 2007 to a new high of 10% in 2008; the number of multi-family housing units ENERGY STAR qualified fell by 225 units or 41% in 2008, while their share of estimated statewide multi-family units completed in Massachusetts fell from 14% in 2007 to 11% in 2008.

Figure 2-8 is the same as Figure 2-7 except that the 2006 through 2008 data include housing units completed through the Program under the EMU and Code Plus participation paths. Including housing units participating though non-ENERGY STAR paths increases the number of housing units completed through the Program from 2,610 to 3,318 in 2006, from 1,286 to 1,616 in 2007, and from 986 to 1,396 in 2008. Completed ENERGY STAR, EMU and Code Plus housing units as a percentage of estimated total housing units completed in Massachusetts climbed from 11% in 2007 to 15% in 2008; single family homes completed through the Program climbed from 8% to 12% of estimated statewide single family home completions; multi-family units completed through the Program remained constant at 20% of estimated statewide multi-family unit completions.

[2] In 2003, the Program began tracking recruited and completed homes under the Census Bureau single family and multi-family housing category definitions, which is how housing permit data are reported. Under the Census Bureau definitions, single family includes fully detached housing units, semi detached (semi attached, side-by-side) housing units, row houses, and townhouses. In the case of attached units, each must be separated from the adjacent unit by a ground-to-roof wall and must not share heating/air-conditioning systems or inter-structural public utilities such as water supply, power supply, or sewage disposal lines. Because housing units qualified as ENERGY STAR since 2003 are tracked using the Census Bureau definitions, it is possible to separately calculate the estimated percentages of multi-family and single family housing units completed in the state that participated in the Program.

Figure 2-6: ENERGY STAR, EMU and Code Plus Housing Units Completed

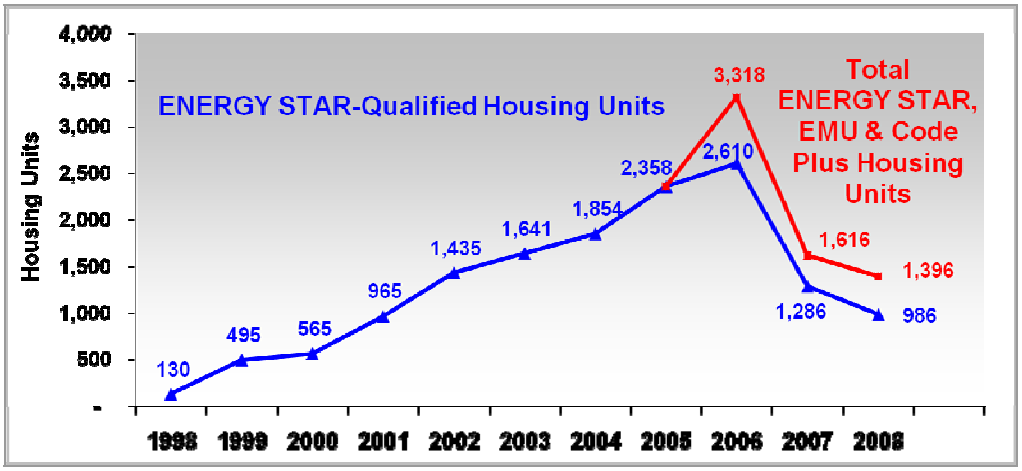


Figure 2-7: ENERGY STAR Completions as Percent of Statewide Completions

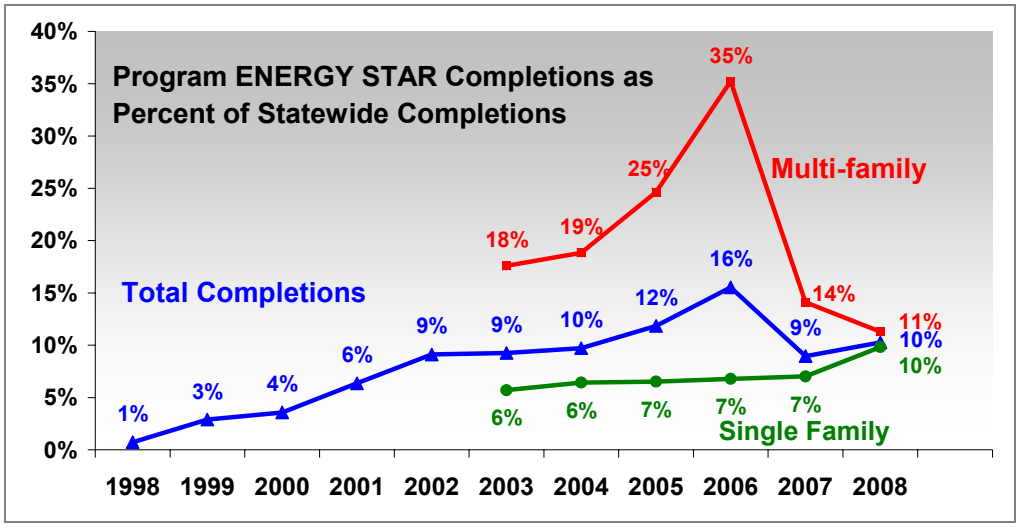
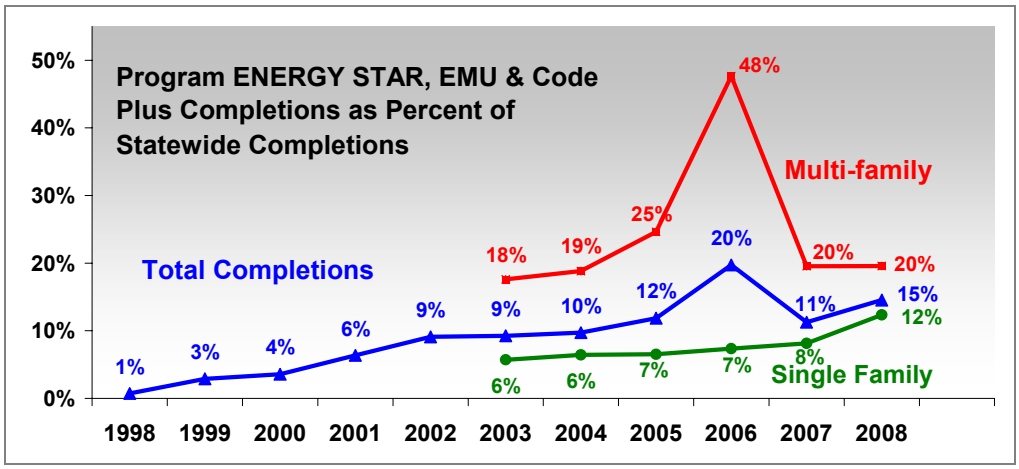


Figure 2-8: ENERGY STAR, EMU and Code Plus Completions as Percent of Statewide Completions

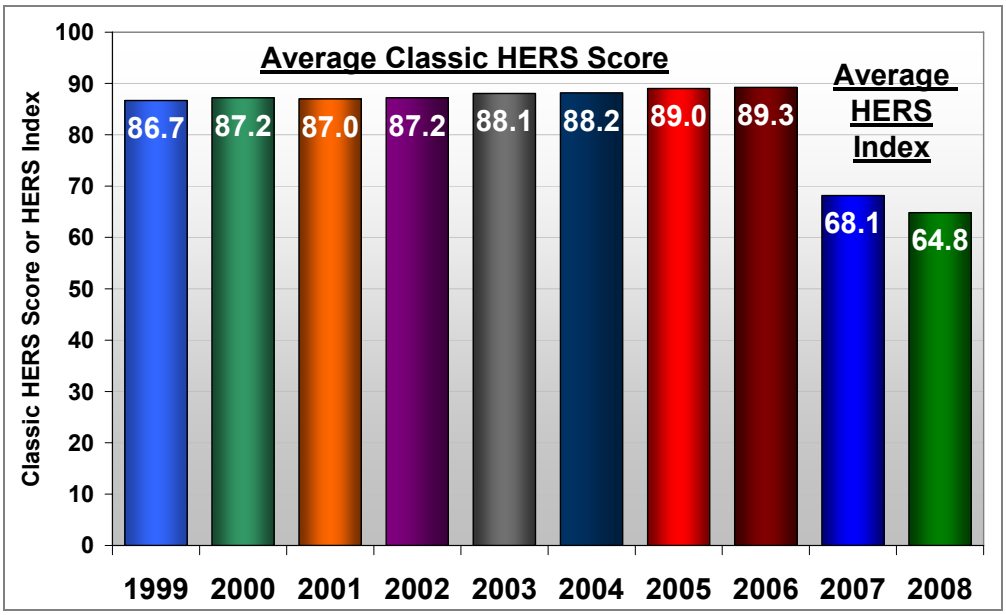


2.4 HERS Ratings

Through 2005, all ENERGY STAR-qualified housing units were rated using the classic HERS score.[3] In 2006, the HERS index[4] approach to rating homes was introduced; most homes qualified in 2006 (92%) were rated using the classic HERS score. Homes completed in 2007 and 2008 were rated using the HERS index approach.

Figure 2-9 shows the average classic HERS score for housing units ENERGY STAR qualified in 1999 through 2006 and the average HERS index for housing units ENERGY STAR qualified in 2007 and 2008. As shown, the average HERS rating has improved each year. The average classic HERS score of housing units qualified in 1999 was 86.7 and by 2006 climbed to 89.3; this 2.6 point increase in the average classic HERS score equates to an increase of 13% in energy efficiency. The average HERS index improved from 68.1 in 2007 to 64.8 in 2008 representing a 3.3% increase in energy efficiency. The average 64.8 HERS index corresponds to a home 34.2% more energy efficient than the 2006 International Energy Conservation Code reference home.

Figure 2-9: 1999 – 2008 Average HERS Ratings

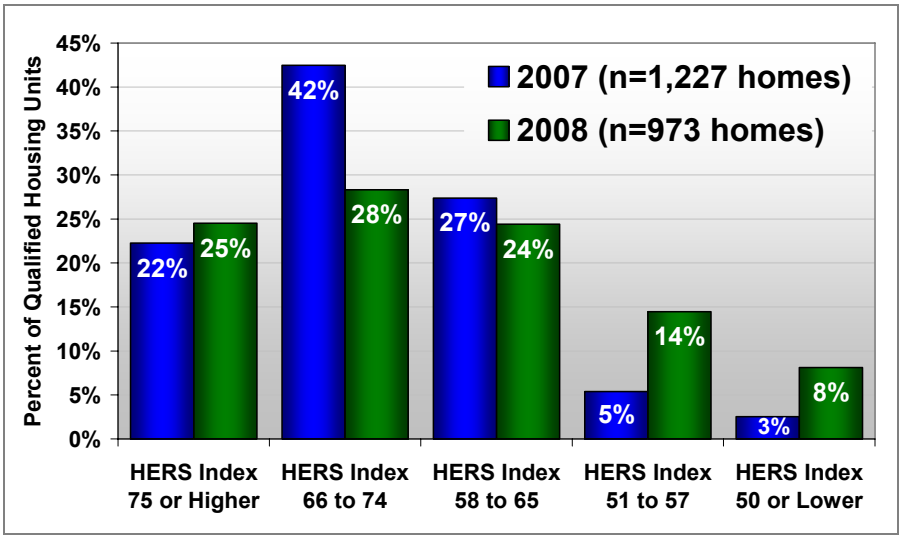


[3]For homes rated before July 1, 2006, the rating score is known as a "HERS Score." The HERS Score is a system in which a home built to the specifications of the HERS Reference Home (based on the 1993 Model Energy Code) has a HERS Score of 80. Unlike the HERS Index, each 1-point increase in a HERS Score is equivalent to a 5% increase in energy efficiency. Source: http://www.energystar.gov/index.cfm?c=bldrs_lenders_raters.nh_HERS

[4] The HERS Index is a scoring system established by the Residential Energy Services Network (RESNET) in which a home built to the specifications of the HERS Reference Home (based on the 2006 International Energy Conservation Code) scores a HERS Index of 100, while a net zero energy home scores a HERS Index of 0. The lower a home's HERS Index, the more energy efficient it is in comparison to the HERS Reference Home. Each 1-point decrease in the HERS Index corresponds to a 1% reduction in energy consumption compared to the HERS Reference Home. Source: http://www.energystar.gov/index.cfm?c=bldrs_lenders_raters.nh_HERS

Figure 2-10 compares the percentage of ENERGY STAR-qualified housing units falling into five HERS index ranges in 2007 and 2008. As shown, the biggest differences between the two years are that the percentage of qualified housing units with HERS indices of 66 to 74 fell sharply from 42% in 2007 to 28% in 2008; the percentage of qualified housing units with HERS indices of 51 to 57 grew from 5% to 14%; and the percentage of qualified housing units with HERS indices of 50 or lower grew from 3% to 8%. (A HERS index of 50 is considered an indication that a home could qualify for the $2,000 federal tax credit.). A likely factor in the increased percentage of homes achieving HERS indices of 65 or lower in 2008 is the 2008 Program's strategy to encourage builders to build to higher efficiency levels by paying a higher incentive for homes achieving HERS indices of 65 or lower.

Figure 2-10: 2007 and 2008 HERS Indices*



- Percentages do not add to 100 because of rounding.

Figure 2-11, Figure 2-12 and Figure 2-13 on the next page show the individual HERS indices achieved by homes qualified in 2008 for all qualified homes, qualified single family homes and qualified multi-family units, respectively. As shown, the average HERS index for all housing units is the same as the average for multi-family units, at 65; the average HERS index for single family homes is slightly higher at 66. The median HERS index for all housing units is 66, for single family homes is 67 and for multi-family units is 65. The range of HERS indices achieved by single family homes is much larger than for multi-family units: HERS indices achieved by multi-family units range from 85 to 44, while HERS indices achieved by single family homes range from 85 to 20.

Figure 2-11: 2008 HERS Indices—All Housing Units

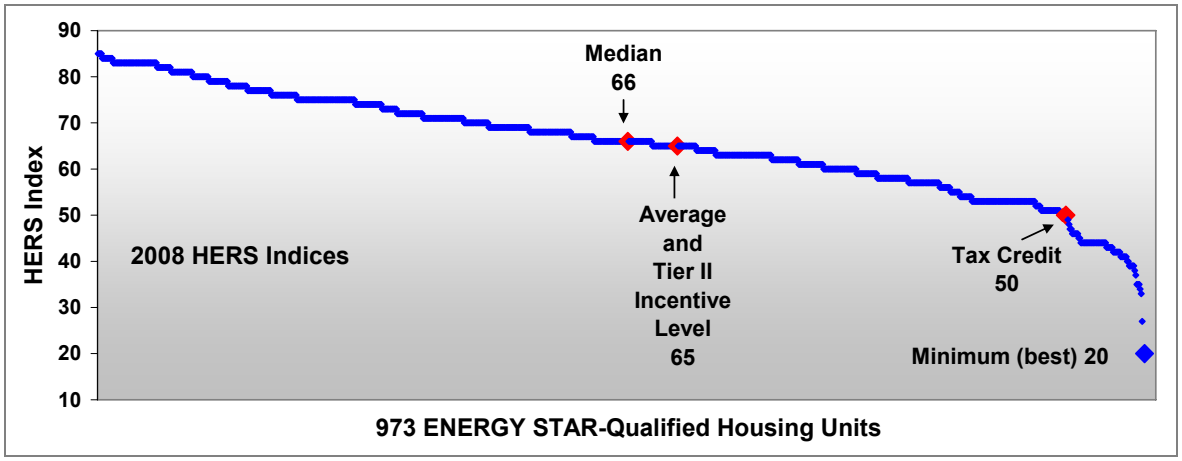


Figure 2-12: 2008 HERS Indices—Single Family Homes

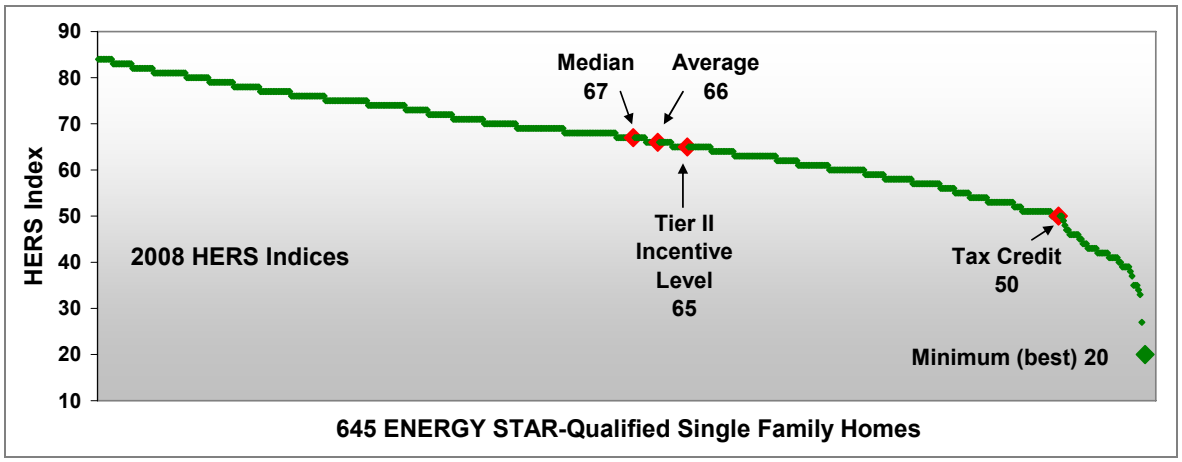
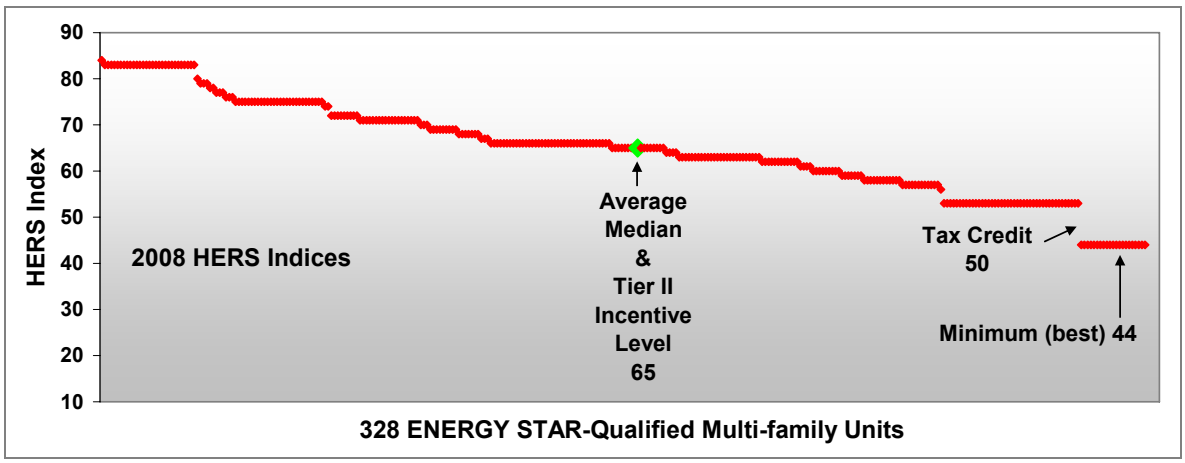


Figure 2-13: 2008 HERS Indices—Multi-family Units



2.5 Spending per Participating Housing Unit

Table 2-1 shows that the number of housing units signed in one year peaked in 2005 at 4,761. Beginning in 2006, homes were signed under non-ENERGY STAR as well as ENERGY STAR participation paths—ENERGY STAR and EMU paths in 2006 and ENERGY STAR and Code Plus paths in 2007 and 2008. The total number of housing units signed dropped sharply in 2006 and again in 2007, reflecting the impacts of not recruiting multi-family units in buildings over three stories and the slow down in the new construction market. The sharp increase in housing units signed in 2008 likely reflects the combined impact of increased Program marketing and aggressive recruiting by participating HERS raters.

The annual number of housing units completed through the Program rose steadily through 2006, then plunged in 2007. The drop in 2007 completions again reflects the impacts of the depressed market for new housing and the Program not qualifying multi-family units in buildings over three stories. The number of housing unit completed in 2008 is 220 or 14% lower than in 2007. However, as described earlier, the estimated number of housing units completed statewide in 2008 fell by more than the percentage of housing units completed through the Program (33% vs. 14%) resulting in the penetration of housing units completed through the Program growing from 11% in 2007 to 15% in 2008.

Table 2-1: Annual Program Spending, Signings and Completions

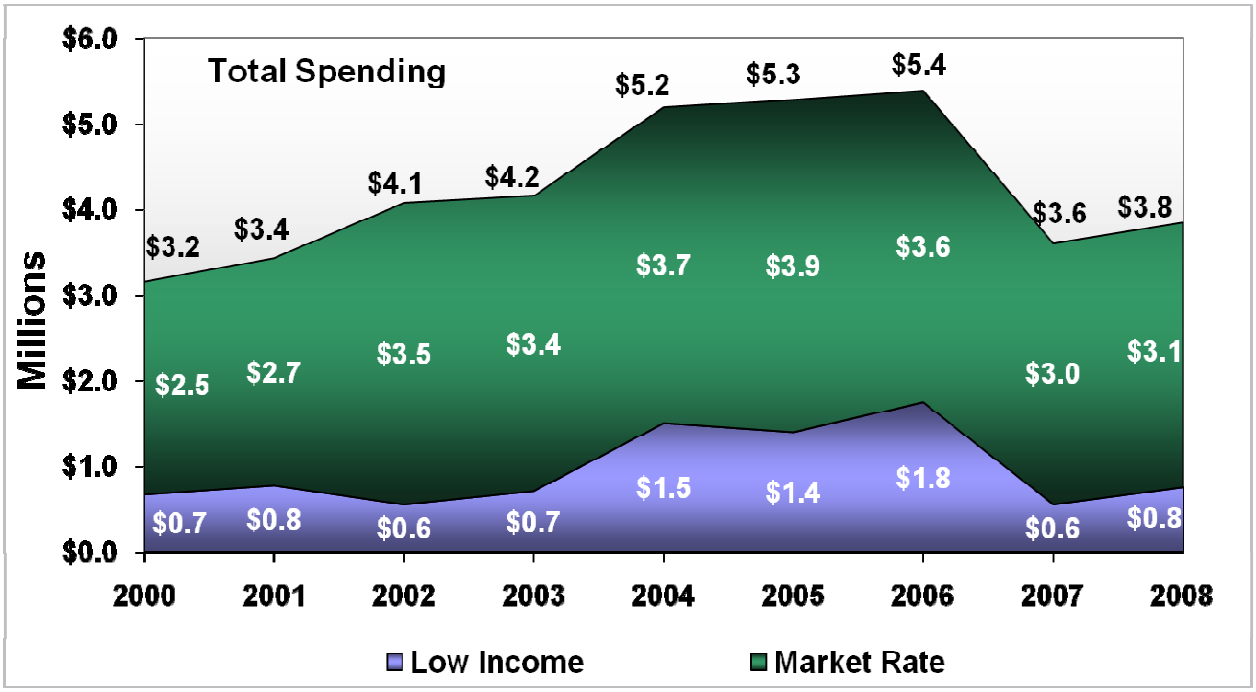
Year	Spending $Thousands	Housing Units Signed	Housing Units Completed
2000	$3,160	2,085	565
2001	$3,434	2,715	965
2002	$4,078	2,423	1,435
2003	$4,160	2,063	1,630
2004	$5,193	3,320	1,854
2005	$5,284	4,761	2,358
2006*	$5,390	2,580	3,318
2007*	$3,610	1,994	1,616
2008*	$3,848**	4,854	1,396

* 2006–2008 include ENERGY STAR, EMU and Code Plus housing units.

**Preliminary Estimate

Figure 2-14 shows annual spending by electric Program Sponsors increased each year from 2000 to 2006, then declined sharply in 2007, predominantly due to a decrease in low income spending.[5] Spending for both low income and market rate components of the Program increased in 2008.

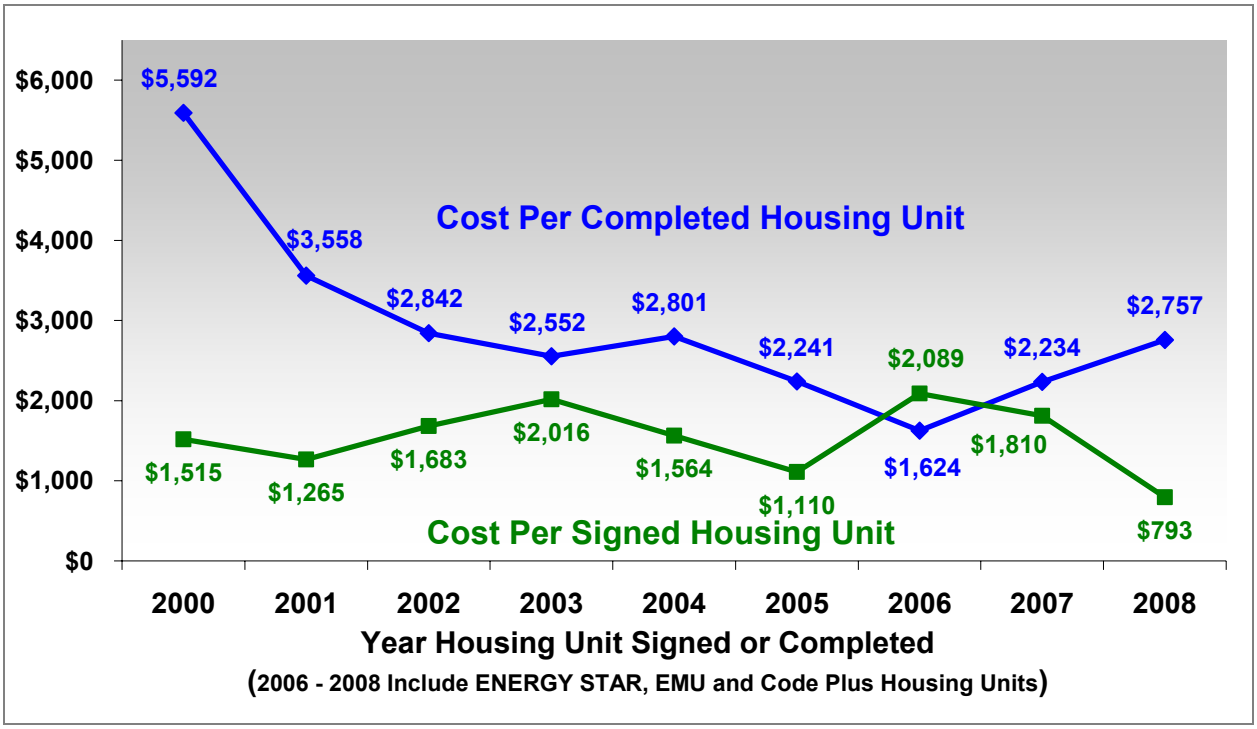
Figure 2-14: Annual Program Spending



[5] The cost data are from annual reports filed with the Division of Energy Resources (DOER) by the electric utilities and Cape Light Compact. The cost data include customer incentives plus in-house and contracted out expenses for planning and administration, marketing, and implementation. The cost data do not include evaluation expenses, market research expenses, performance incentives, other costs or participant costs.

Figure 2-15 shows the annual spending per signed housing unit and per completed housing unit. The dramatic decrease in spending per completed housing unit from the early years of the Program is largely a reflection of the lag between the time housing units are signed up and the time they are qualified. 2006 through 2007 include housing units signed and completed under both ENERGY STAR and non-ENERGY STAR paths. The sharp decline in 2008 spending per signed housing unit is the result of the number of units signed increasing by a higher percentage than spending—the number of housing units signed more than doubled from 2007 to 2008 while spending increased by only 7%. Conversely, the increase in 2008 spending per completed housing unit is the result of the number of completed housing units decreasing while spending increased— the number of completed housing units dropped 14% while spending increased by 7%.

Figure 2-15: Annual Spending per Housing Unit



3 2008 Housing Units Completed

Figure 3-1 shows the allocation of 2008 completions between single family and multi-family for combined ENERGY STAR and Code Plus completions; only ENERGY STAR completions; and only Code Plus completions.

Figure 3-1: All 2008 Completions by Housing Type

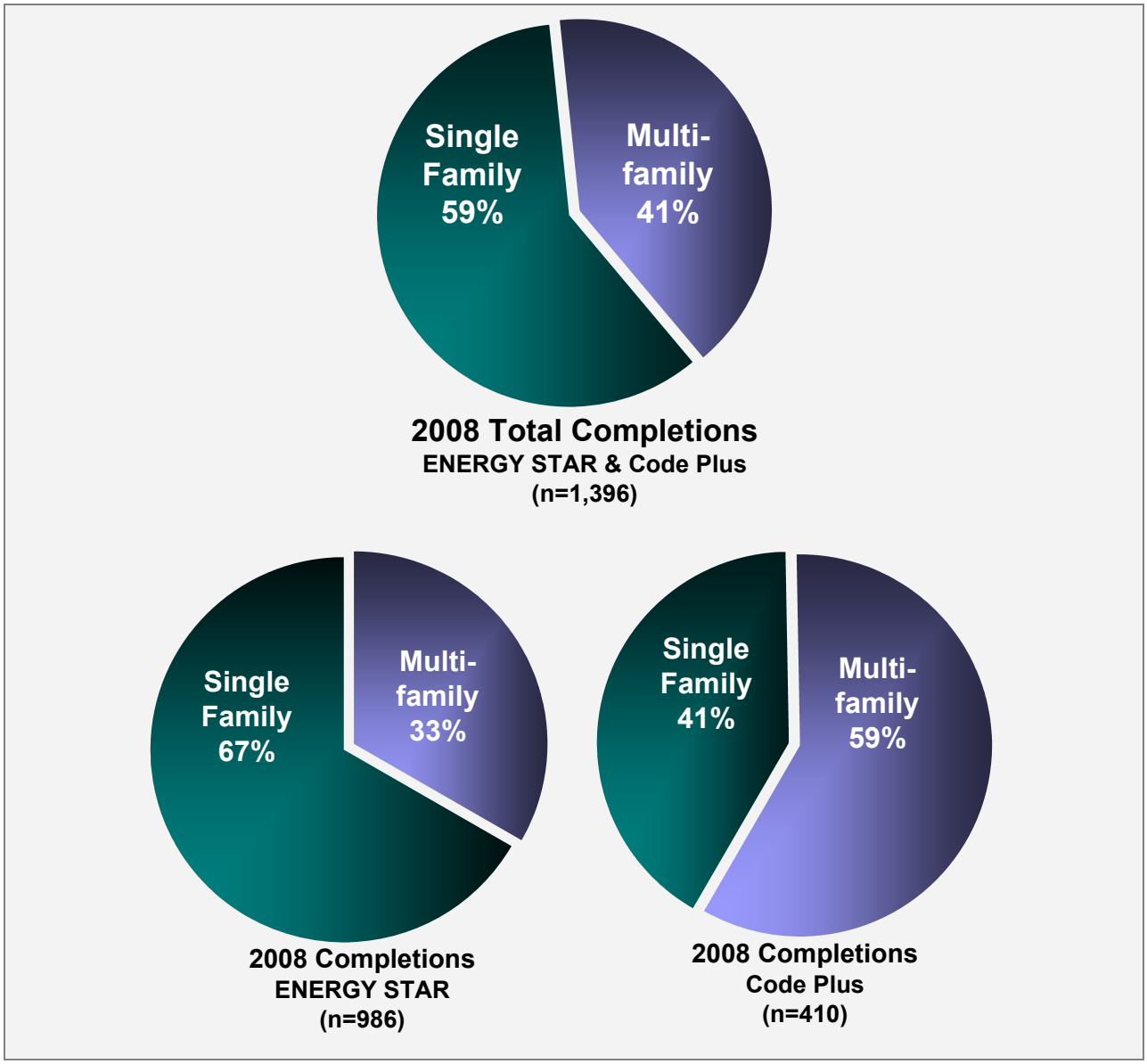


Figure 3-2 shows the allocation of 2008 market rate completions between single family and multi-family for combined ENERGY STAR and Code Plus completions; only ENERGY STAR completions; and only Code Plus completions.

Figure 3-2: 2008 Market Rate Completions by Housing Type

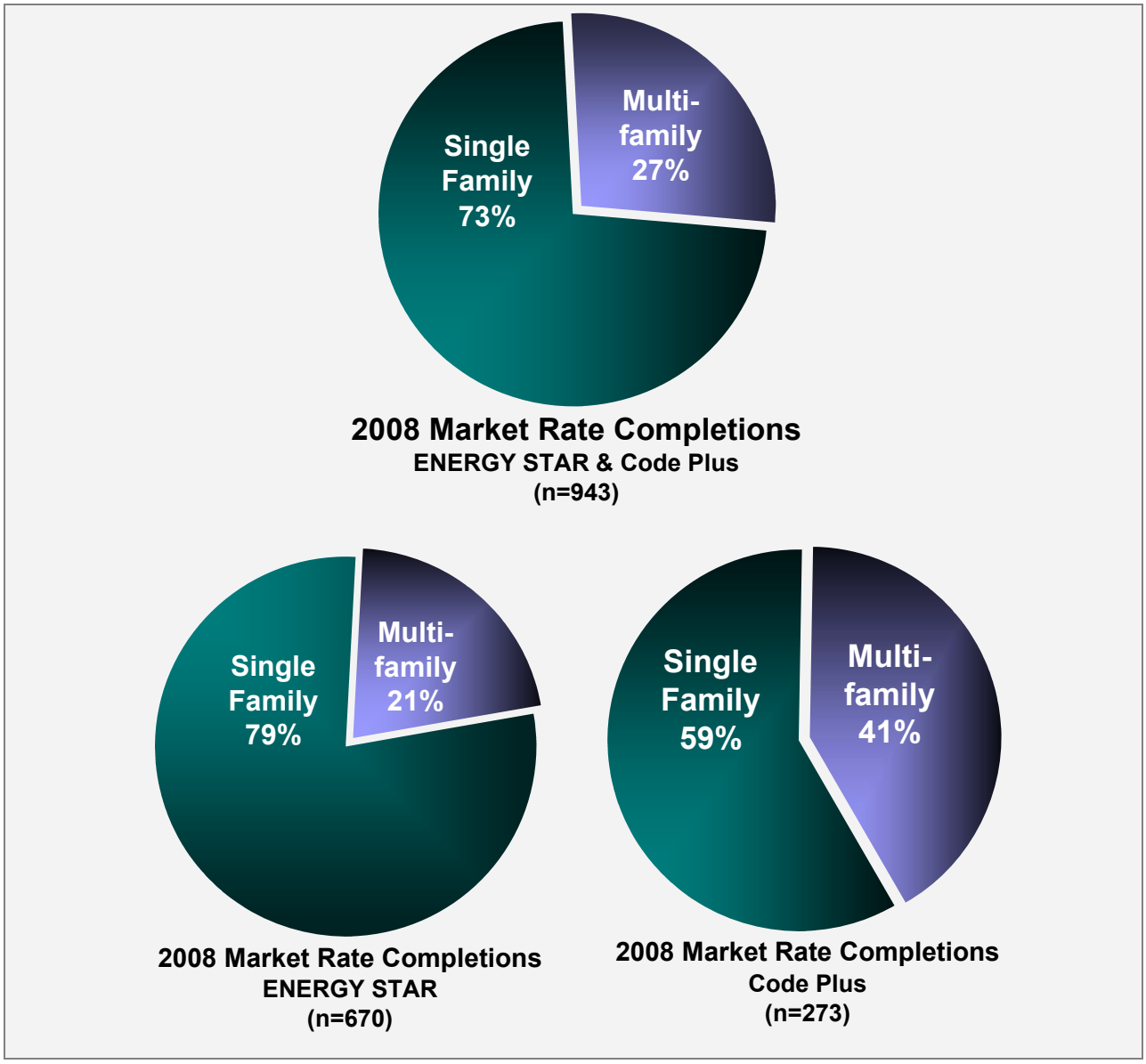
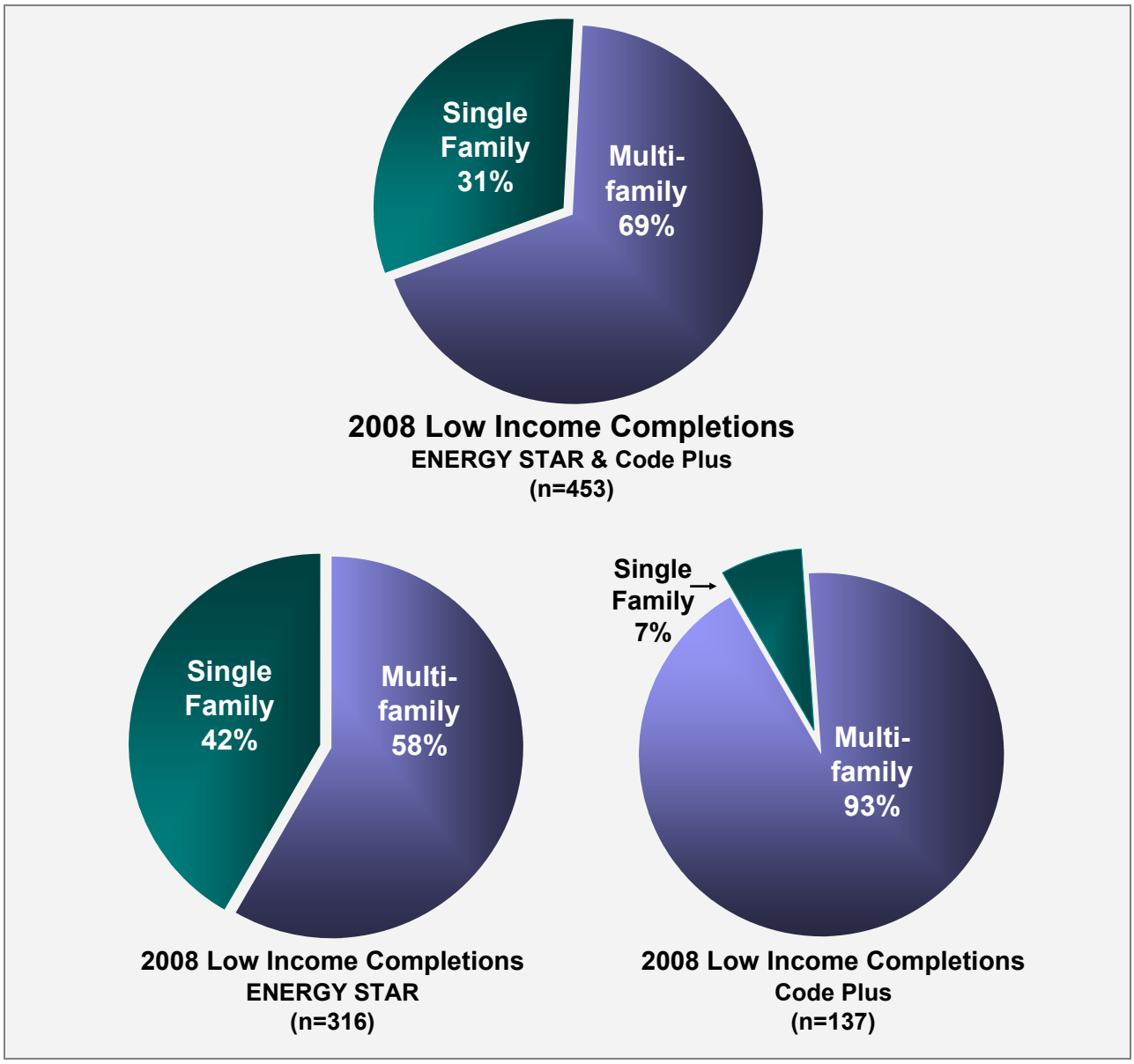


Figure 3-3 shows the allocation of 2008 low income completions between single family and multi-family for combined ENERGY STAR and Code Plus completions; only ENERGY STAR completions; and only Code Plus completions.

Figure 3-3: 2008 Low Income Completions by Housing Type



4 Distribution of Completions across Sponsor Territories

This section shows the distribution of housing units completed through the Program in 2008 by electric and gas Sponsors. Table 4-1 and Table 4-2 show the data used to generate the figures on the following pages.

Table 4-1: Electric Sponsor 2008 Completed Housing Units

Electric Sponsors	Code Plus Completions			ENERGY STAR Completions			Total Completions: ENERGY STAR and Code Plus
	Total Units	Market Rate Units	Low Income Units	Total Units	Market Rate Units	Low Income Units	
National Grid	81	75	6	305	257	48	386
NSTAR	323	197	126	493	270	223	816
Western Mass Electric (WMECo)	0	0	0	87	56	31	87
Cape Light Compact (CLC)	6	1	5	79	65	14	85
Unitil	0	0	0	13	13	0	13
Municipals (Muni)	0	0	0	9	9	0	9
Totals:	**410**	**273**	**137**	**986**	**670**	**316**	**1,396**

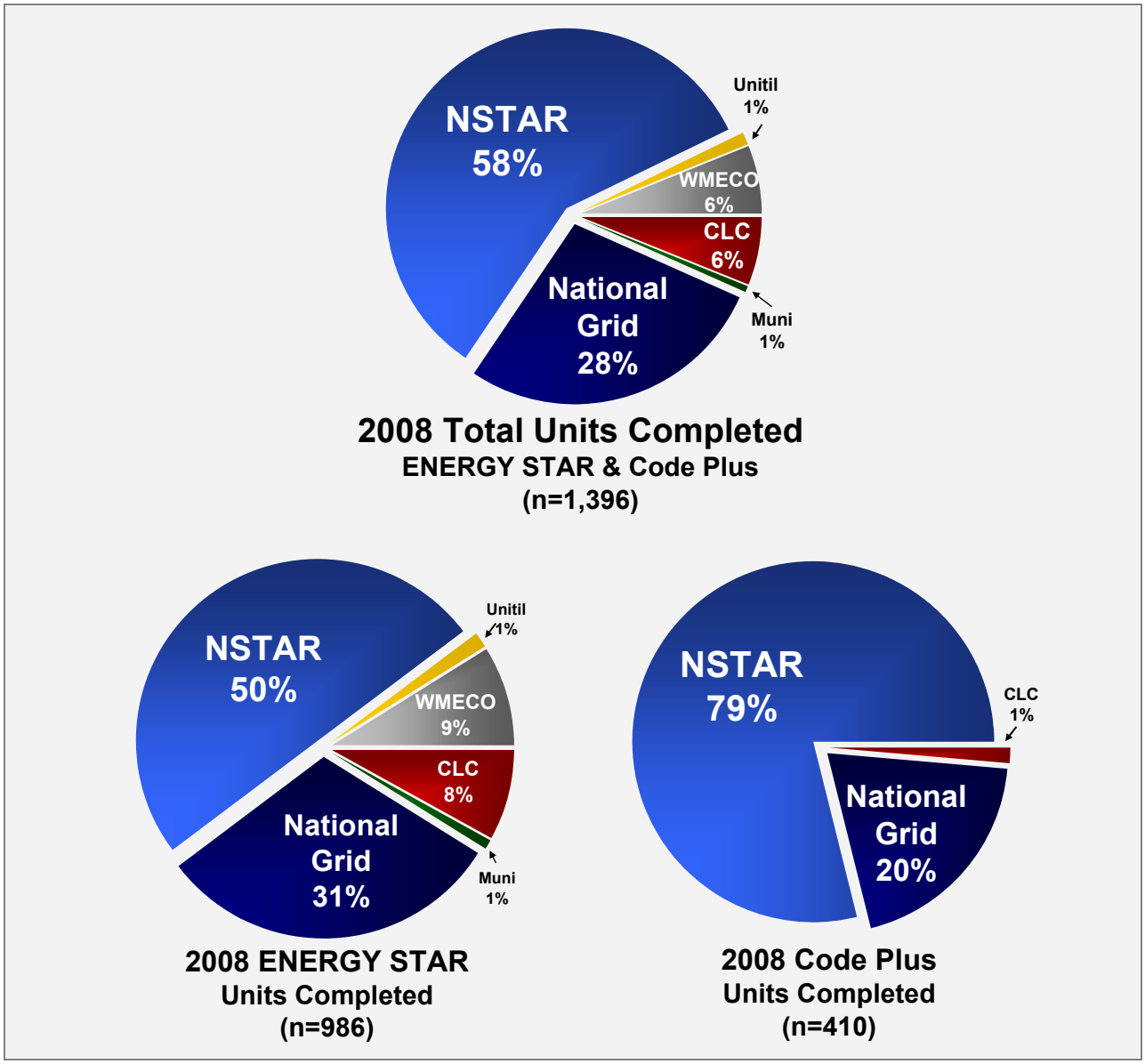
Table 4-2: Gas Sponsor 2008 Completed Housing Units

Gas Sponsors	Code Plus Completions			ENERGY STAR Completions			Total Completions: ENERGY STAR and Code Plus
	Total Units	Market Rate Units	Low Income Units	Total Units	Market Rate Units	Low Income Units	
Bay State Gas	21	20	1	125	91	34	146
National Grid	360	227	133	495	268	227	855
Berkshire Gas (BRKSH)	0	0	0	37	23	14	37
NSTAR	25	22	3	208	179	29	233
New England (NE)	3	3	0	9	9	0	12
No Gas Sponsor	1	1	0	112	100	12	113
Totals:	**410**	**273**	**137**	**986**	**670**	**316**	**1,396**

4.1 Electric Sponsor Territories

Figure 4-1 shows the percentage of total ENERGY STAR and Code Plus housing units completed in 2008 in each of the electric Sponsors' service areas and in municipal electric service areas; the percentage of total ENERGY STAR-qualified housing units completed in 2008 in each of the electric Sponsors' service areas and in municipal electric service areas; and the percentage of total Code Plus housing units completed in 2008 in each of the electric Sponsors' service areas and in municipal electric service areas.

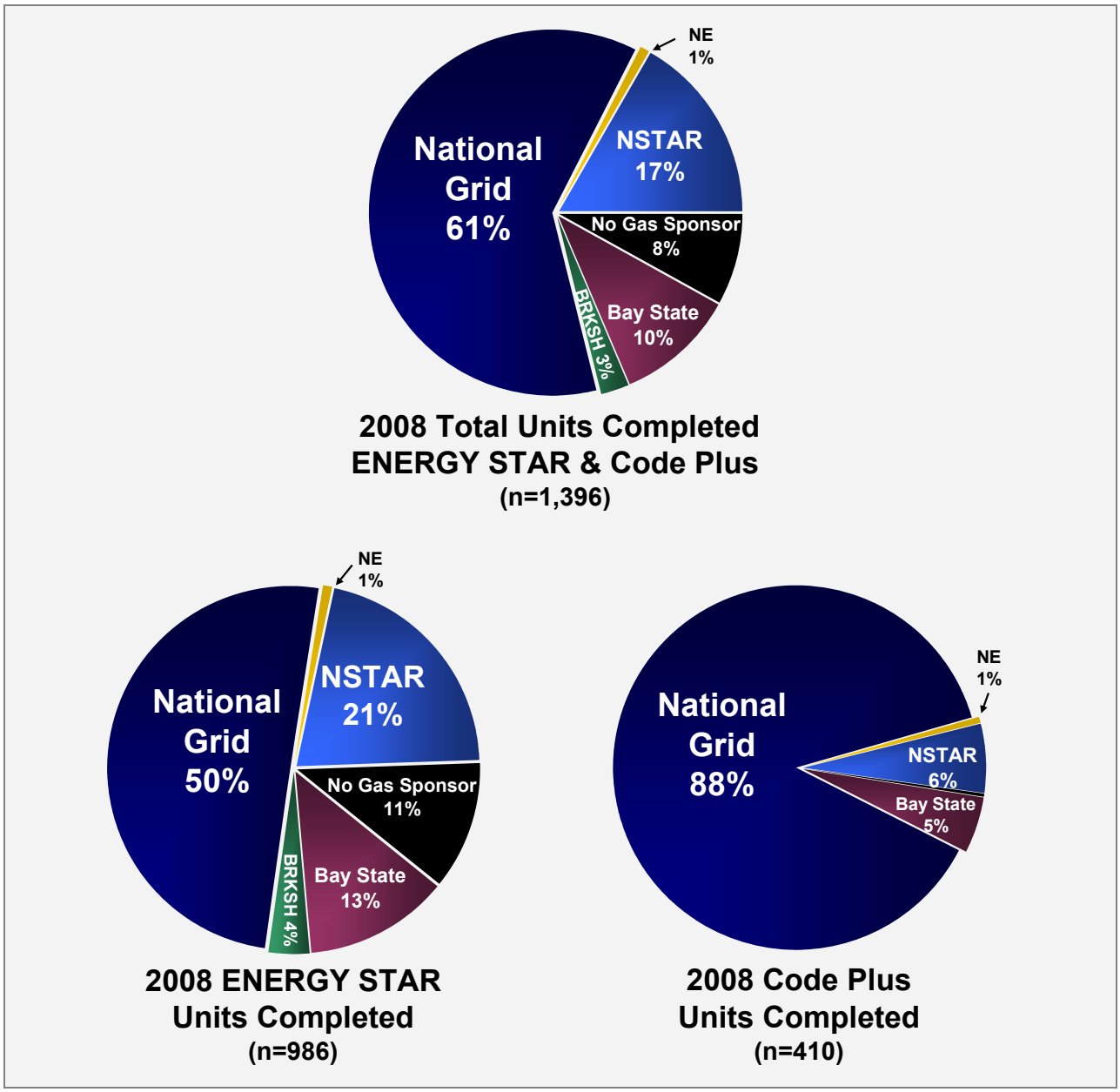
Figure 4-1: Electric Sponsor 2008 Completed ENERGY STAR and Code Plus Housing Units



4.2 Gas Sponsor Territories

Figure 4-2 shows the percentage of total ENERGY STAR and Code Plus housing units completed in 2008 in each of the gas Sponsors' service areas and in areas not served by the gas Sponsors; the percentage of total ENERGY STAR-qualified housing units completed in 2008 in each of the gas Sponsors' service areas and no gas Sponsor areas; and the percentage of total completed Code Plus housing units in 2008 in each of the gas Sponsors' service areas and no gas sponsor areas.

Figure 4-2: Gas Sponsor 2008 Completed ENERGY STAR and Code Plus Housing Units



5 2008 Projects and Housing Units Recruited

Figure 5-1 and Figure 5-2 show, respectively, the annual percentages of market rate and low income projects and housing units recruited from 2003 through 2008. Low income projects are defined as any project that includes at least one low income unit. As shown, in 2008 the percentages of both projects and housing units recruited that are low income are higher than in previous years.

Figure 5-1: Percent of 2003–2008 Market Rate versus Low Income Projects Signed

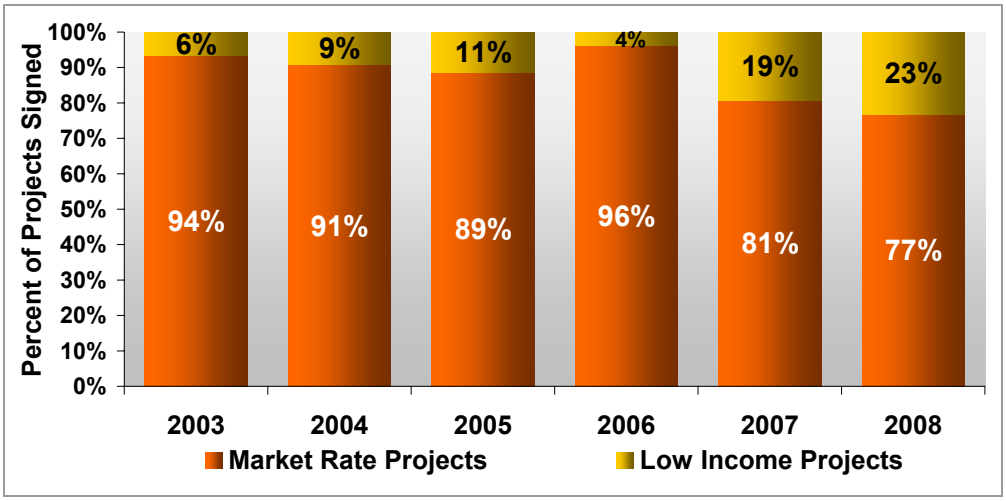
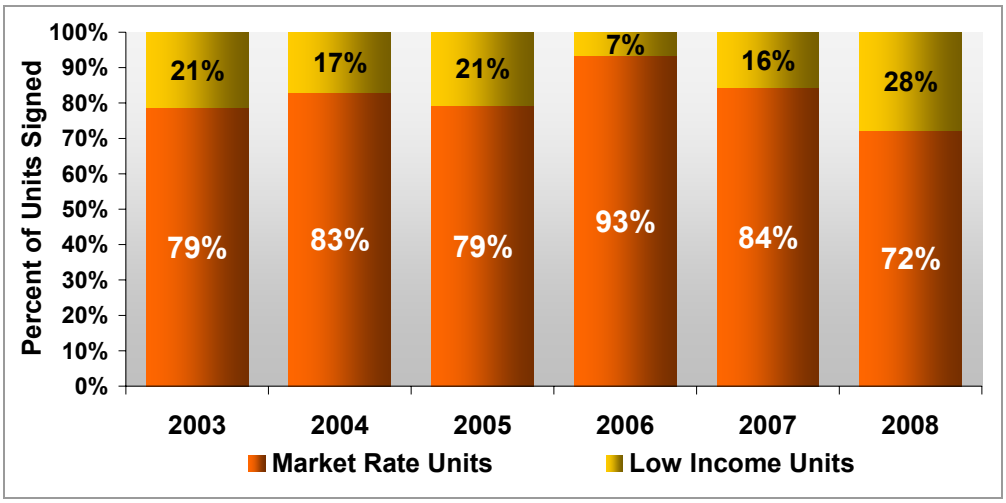


Figure 5-2: Percent of 2003–2008 Market Rate versus Low Income Housing Units Signed



5.1 2008 Recruited Projects by Size—Number of Units

Figure 5-3 and Figure 5-4 show the annual percentages of projects and housing units signed from 2003 through 2008 falling into various size categories based on the number of housing units in the project. Figure 5-3 shows single homes account for over half of all signed projects in each year but 2007 (48% in 2007). Projects with more than 25 units account for 15% or less of signed projects in each year. However, as Figure 5-4 shows, in every year a majority (65% to 80%) of signed housing units are in the large, over 25 unit projects and 10% or fewer in one- to five-unit projects.

Figure 5-3: 2003—2008 Signed Projects by Number of Housing Units per Project

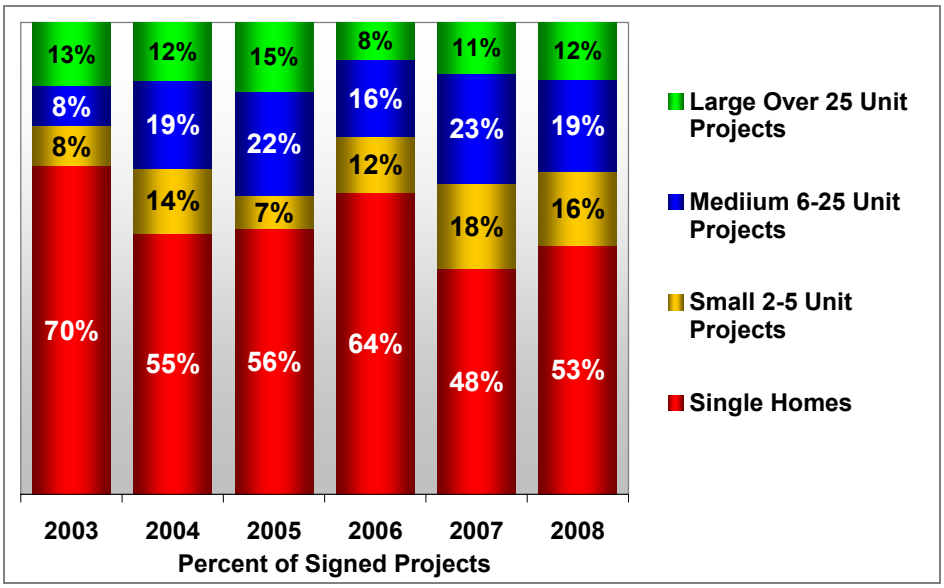


Figure 5-4: 2003—2008 Signed Housing Units by Project Size

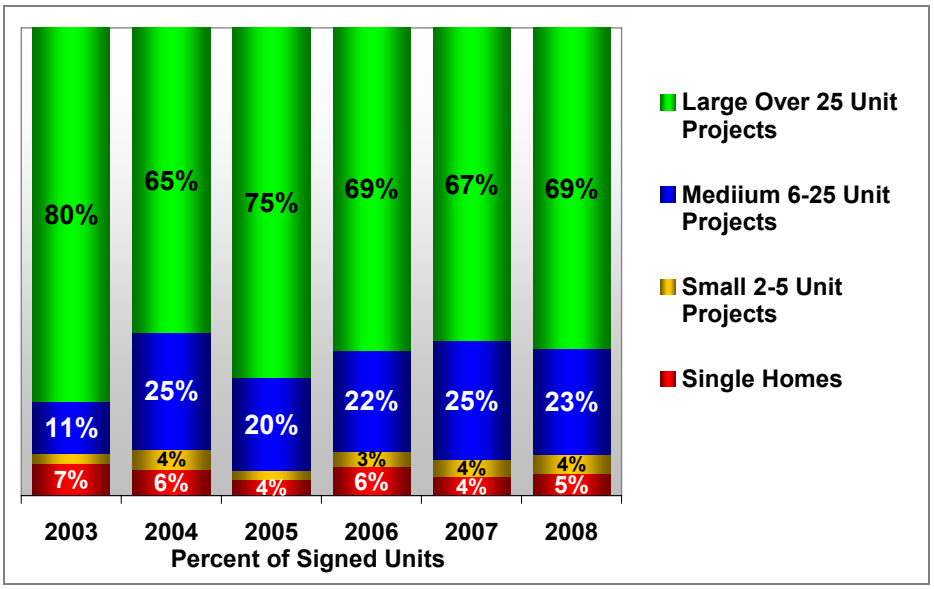
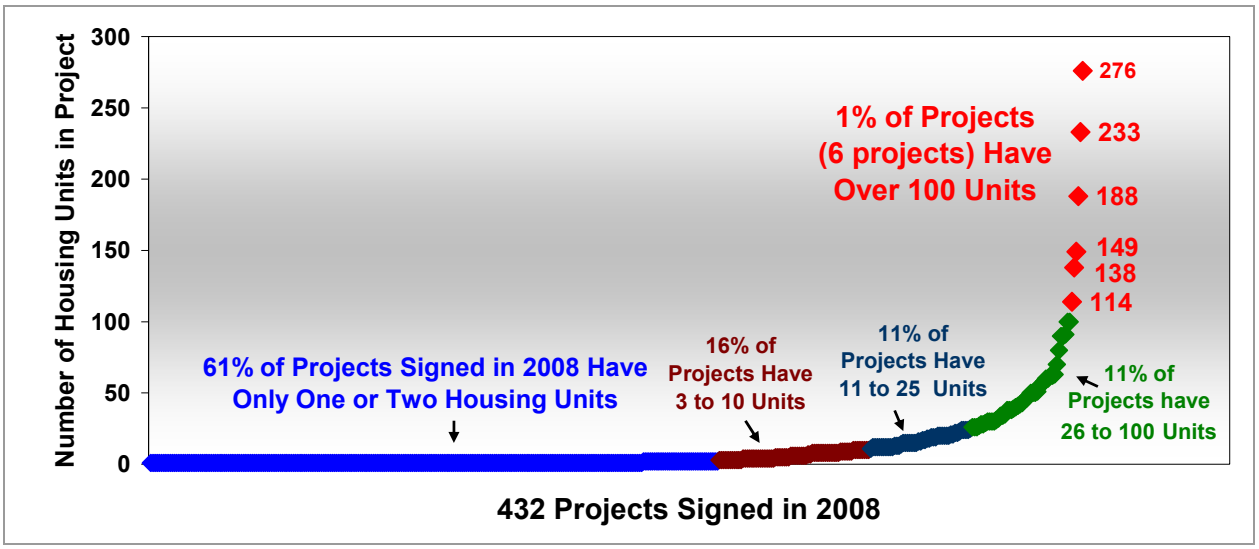


Figure 5-5 is another way of showing the very high percentage of projects signed in 2008 that have very few housing units and includes the number of units in the individual very large projects. Going forward it will be interesting to see if the percentage of one- and two-unit projects decreases as the Program moves further toward a market driven model using independent HERS raters to recruit projects. HERS raters will likely target multiple unit projects because those projects are more profitable, requiring less time per housing unit to service than single-home projects. On the other hand, if the number of one- and two-unit projects is predominantly driven by small builders who want to participate in the Program and homeowners who want their custom home built to ENERGY STAR standards the percentage of one and two unit projects may continue to be high.

Figure 5-5: 2008 Signed Projects by Number of Housing Units



6 Distribution of Signings across Sponsor Territories

This section shows the distribution of housing units signed in 2008 by electric Sponsor and gas Sponsor. Table 6-1 and Table 6-2 show the data used to generate the figures on the following pages.

Table 6-1: Electric Sponsor Signed Projects and Housing Units

All 2008 Signed Projects and Units						
Electric Sponsors And Municipals	**Total Projects**	**Market Rate Projects**	**Low Income Projects**	**Total Units**	**Market Rate Units**	**Low Income Units**
National Grid	167	126	41	1,747	1,343	404
NSTAR Electric	145	108	37	2,585	1,812	773
Western Mass Electric (WMECo)	48	39	9	280	211	69
Cape Light Compact (CLC)	58	47	11	179	86	93
Unitil	NA	NA	NA	NA	NA	NA
Municipals (Muni)	14	12	2	63	58	5
Totals:	**432**	**332**	**100**	**4,854**	**3,510**	**1,344**

Table 6-2: Gas Sponsor Signed Projects and Housing Units

All 2008 Signed Projects and Units						
Gas Sponsors	**Total Projects**	**Market Rate Projects**	**Low Income Projects**	**Total Units**	**Market Rate Units**	**Low Income Units**
Bay State Gas	73	49	24	858	613	245
National Grid	190	139	51	2,685	1,827	858
Berkshire Gas (BRKSH)	18	14	4	199	146	53
NSTAR	74	64	10	838	720	118
New England Gas (NE)	7	5	2	12	9	3
No Gas Sponsor	70	61	9	262	195	67
Totals:	**432**	332	100	**4,854**	**3,510**	**1,344**

6.1 Electric Sponsor Territories

Figure 6-1 shows the percentage of total projects, market rate projects and low income projects signed in 2008 in each of the electric Sponsors' service areas and in municipal electric service areas. Figure 6-2 shows the percentage of total housing units, market rate housing units and low income housing units signed in 2008 in each of the electric Sponsors' service areas and in municipal electric service areas.

Figure 6-1: Electric Sponsor Signed Total, Market Rate and Low Income Projects

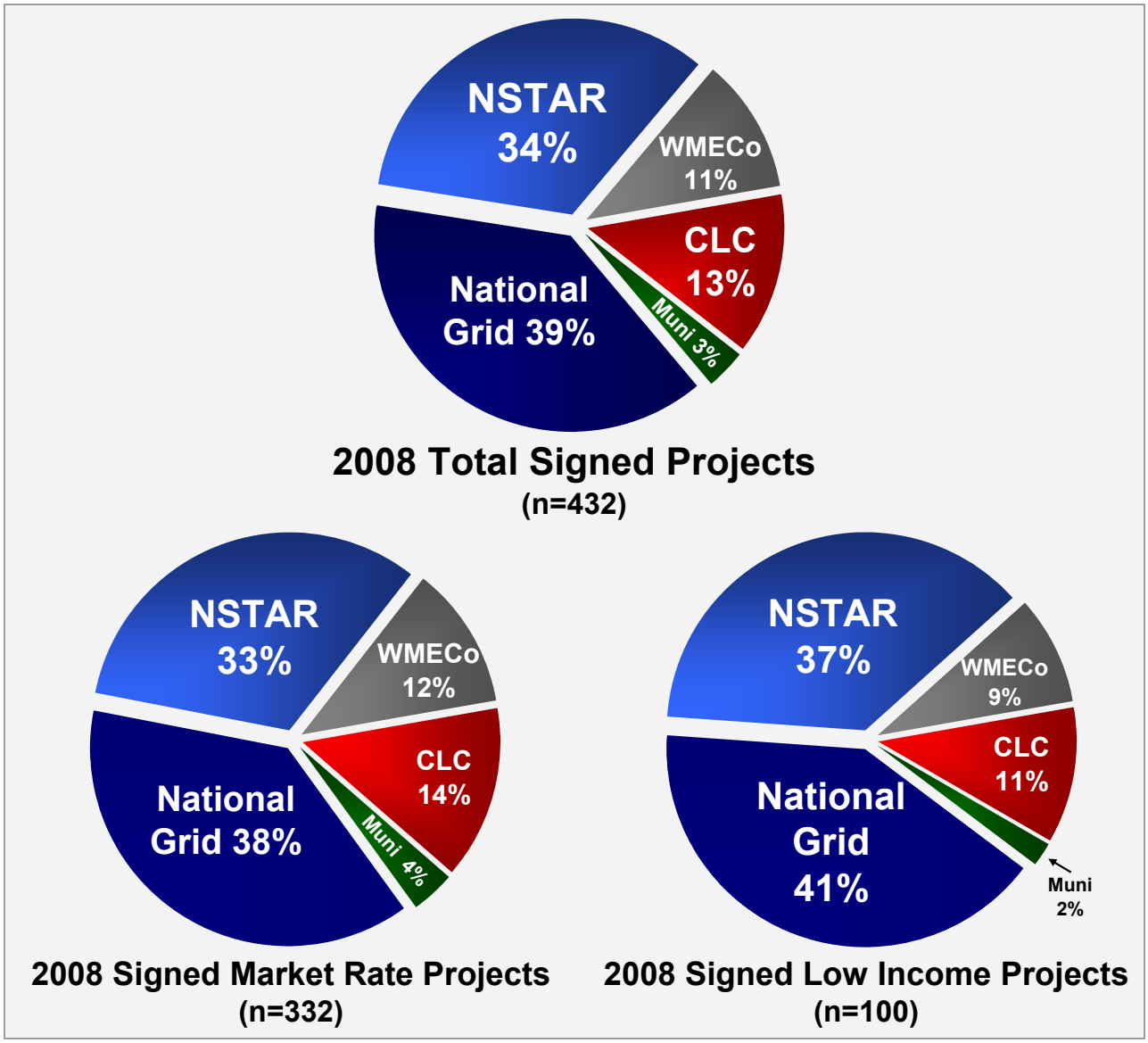
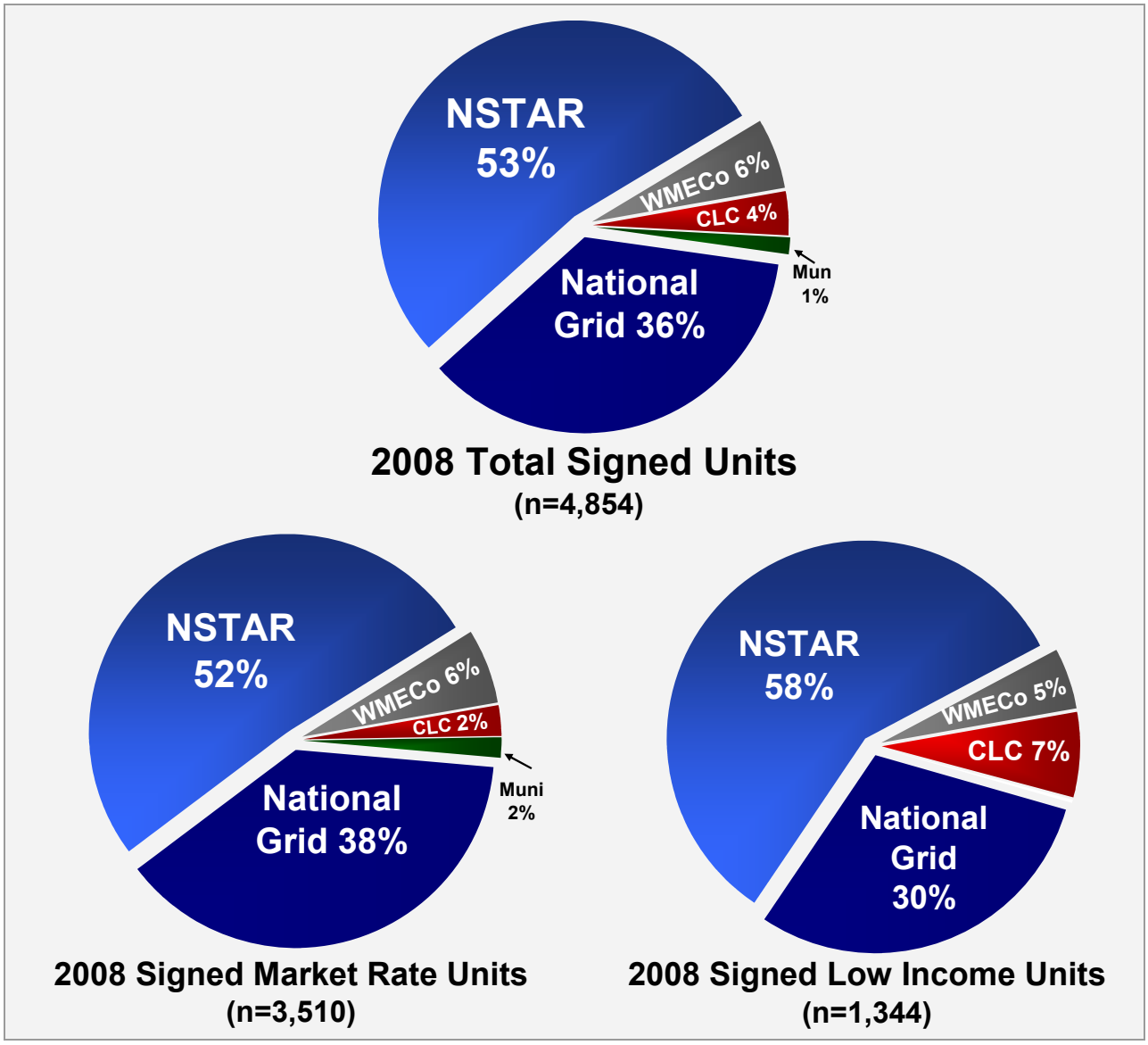


Figure 6-2: Electric Sponsor Signed Total, Market Rate and Low Income Housing Units



6.2 Gas Sponsor Territoriesm.

Figure 6-3 shows the percentage of total projects, market rate projects and low income projects signed in 2008 in each of the gas Sponsors' service areas and in areas where natural gas is not available or gas providers do not sponsor the Program. Figure 6-4 shows the percentage of total housing units, market rate housing units and low income housing units signed in 2008 in each of the gas Sponsors' service areas and in areas where natural gas is not available or gas providers do not sponsor the Program.

Figure 6-3: Gas Sponsor Signed Total, Market Rate and Low Income Projects

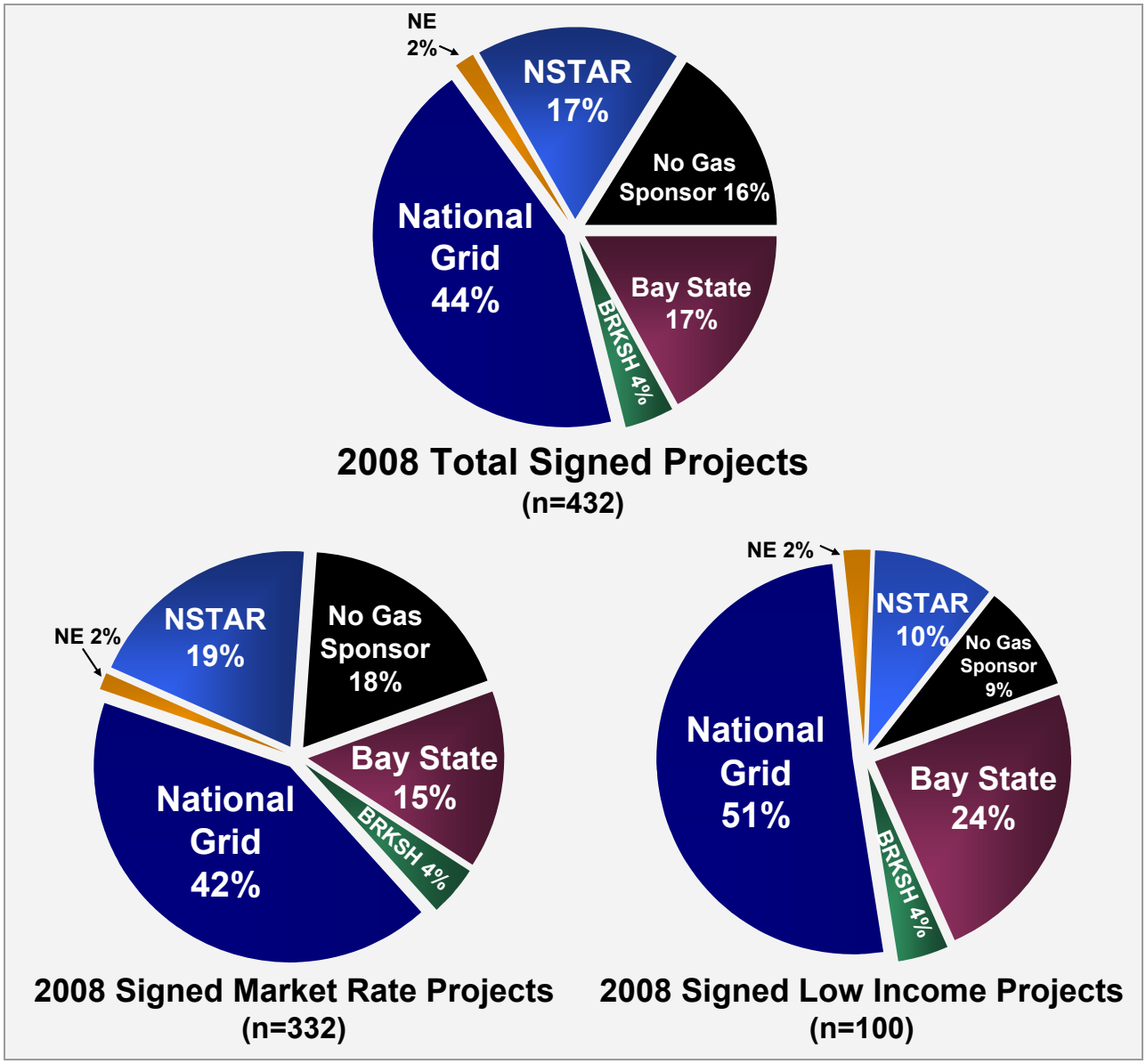
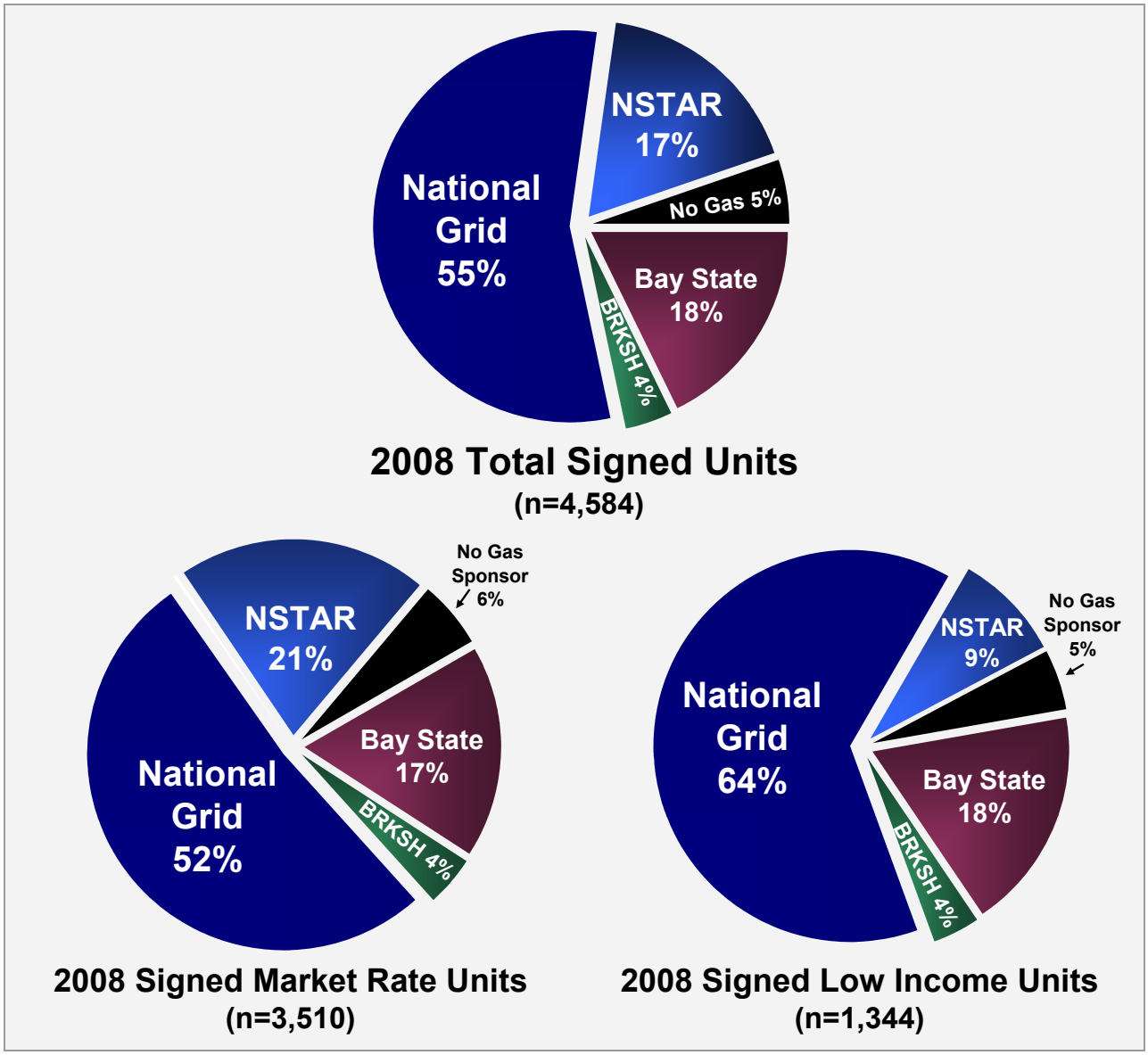


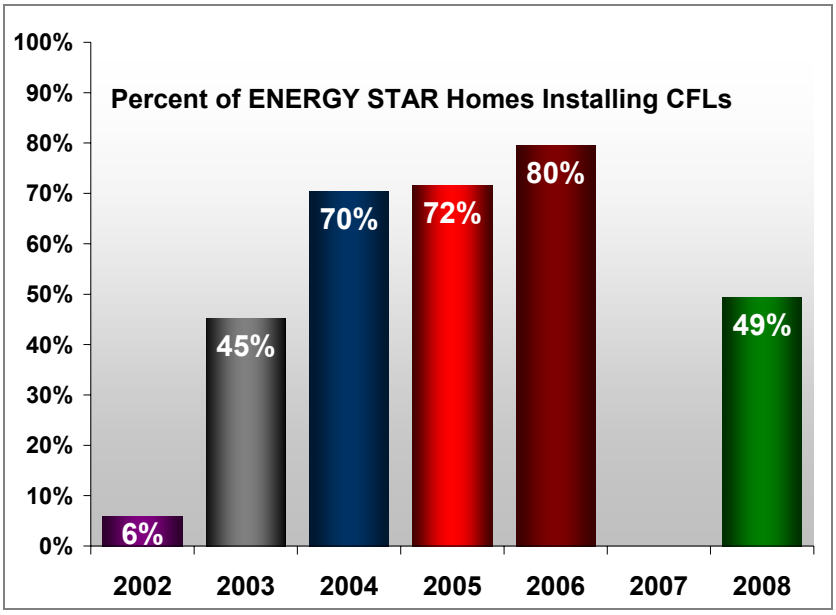
Figure 6-4: Gas Sponsor Signed Total, Market Rate and Low Income Housing Units



7 Lighting

Prior to 2008 builders could have their HERS raters install free compact fluorescent lamps (CFLs) in all appropriate sockets when the final inspection was conducted; builders did not pay anything for the CFLs and there was no limit to the number of CFLs that could be installed. In 2008, builders became responsible for selecting, ordering and installing the free CFLs and received an incentive of $2 for each CFL they installed. Figure 7-1 shows the percentage of ENERGY STAR-qualified housing units in each year from 2002 through 2006 and 2008 that installed CFLs through the Program. (ICF was not able to provide the number of homes installing lighting measures in 2007.) The drop in the percentage of ENERGY STAR-qualified homes installing CFLs in 2008 likely reflects many builders deciding not to install CFLs if they had to select, order and install the CFLs themselves rather than have their HERS rater install them at the final inspection.

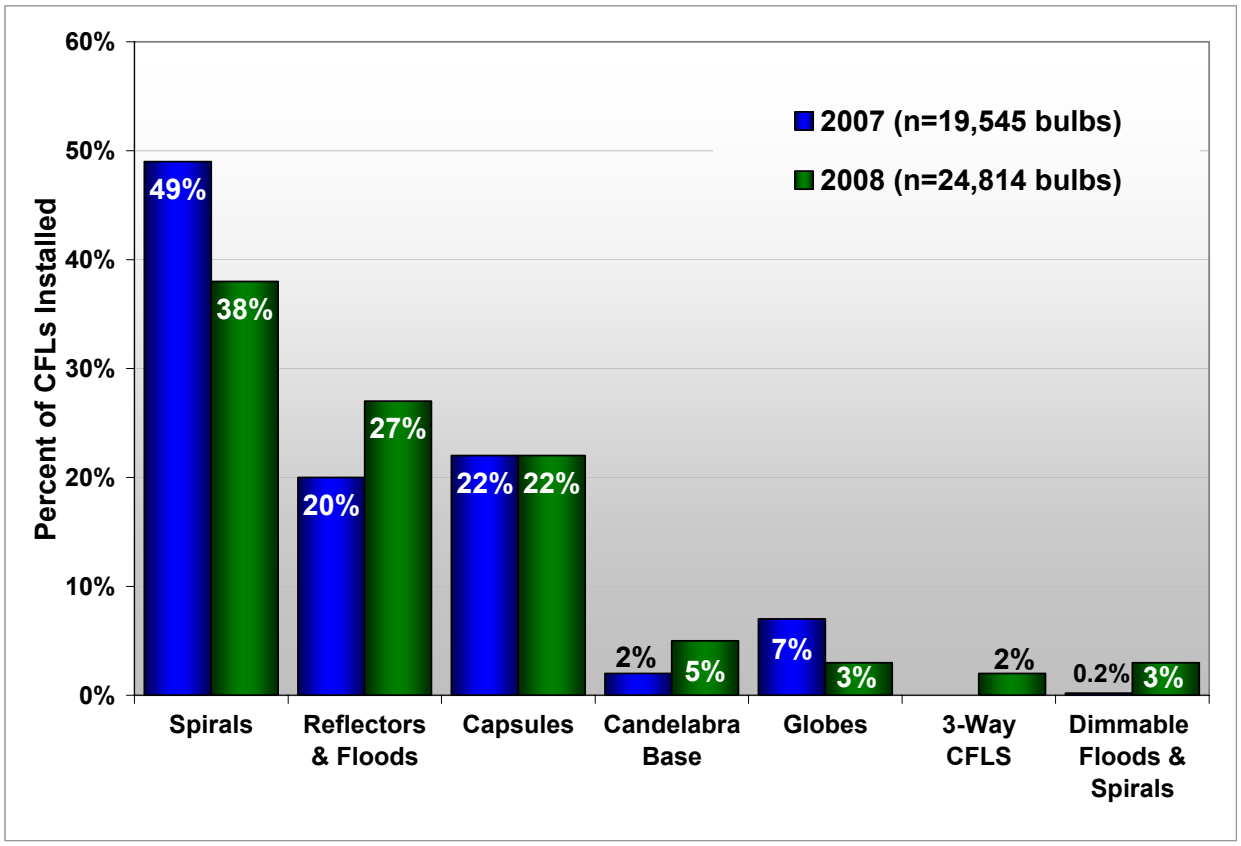
Figure 7-1: Percent of Qualified Housing Units Installing CFLs 2002 – 2008



7.1 Changes in Types of CFLs Installed—2007 to 2008

ICF provided data on the number of CFLs, by bulb type, they installed and verified in participating homes in the 2007 and 2008 Program years. Almost all (91%) of the bulbs installed in 2008 were ordered and installed by builders. Figure 7-2 shows that spirals remain the most frequently installed type of CFL, but that they accounted for a much smaller percentage of CFLs in 2008 (38% vs. 49% in 2007). Globes also accounted for a smaller percentage of 2008 CFLs (3% vs. 7% in 2007). Capsules accounted for 22% of all CFLs in both 2007 and 2008. Reflectors and floods, candelabra-based bulbs, 3-way bulbs, and dimmable floods and spirals all accounted for larger percentages of bulbs in 2008 than in 2007, though some of the percentages are very low. The drop in the percentage of spirals installed likely reflects builders becoming more familiar with and comfortable with the variety of CFL choices now available to them. ICF installed an average of 25 CFLs per housing unit installing CFLs in 2007. In 2008, the average number of CFLs installed per housing unit installing CFLs was 44.

Figure 7-2: Type of CFLs Installed—2007 and 2008



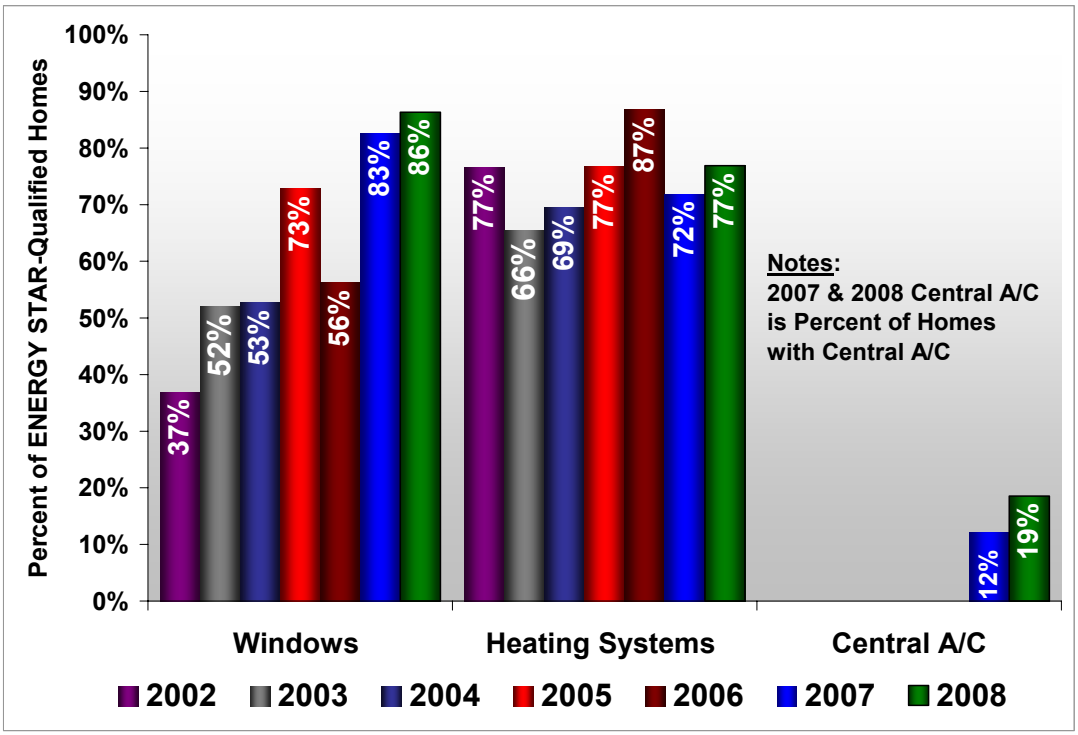
8 ENERGY STAR Windows and HVAC Equipment

Figure 8-1 shows the percentages of ENERGY STAR-qualified housing units that installed ENERGY STAR windows, heating systems and central air conditioning. As shown, the percentage of homes installing ENERGY STAR windows has varied over the years. In 2005, almost three-fourths (73%) of all qualified homes installed ENERGY STAR windows; in 2006 the percentage of homes installing ENERGY STAR windows fell sharply to 56%, then rebounded in 2007 to 83% of qualified homes and rose to 86% in 2008. Window U-values in 2008 ENERGY STAR-qualified housing units range from 0.22 to 0.82; the average is 0.33.

The percentage of ENERGY STAR housing units with ENERGY STAR heating systems increased steadily from 2003 through 2006 to 87%, fell to 72% in 2007 and climbed to 77% in 2008. In 2008, boiler Average Fuel Utilization Efficiencies (AFUEs) range from 80.0 to 98.5; the average is 85.4. Natural gas and propane furnace AFUEs range from 91.9 to 98.0; the average is 91.9.

The percentage of housing units installing ENERGY STAR central air conditioning remains low. The percentages of ENERGY STAR homes installing ENERGY STAR central air conditioning in 2007 and 2008 are percentages of homes with central air conditioning. (Comparable percentages are not available prior to 2007 because data on the number of ENERGY STAR central air conditioning units installed were available, but not on the number of homes with central air conditioning.) The percentage of ENERGY STAR-qualified homes with central air conditioning was 55% in 2007 and 58% in 2008. The average SEER of central air conditioning systems installed in ENERGY STAR-qualified housing units in 2008 (567 homes) is 12.8; the minimum SEER is 9.4 and the maximum SEER is 21.4.

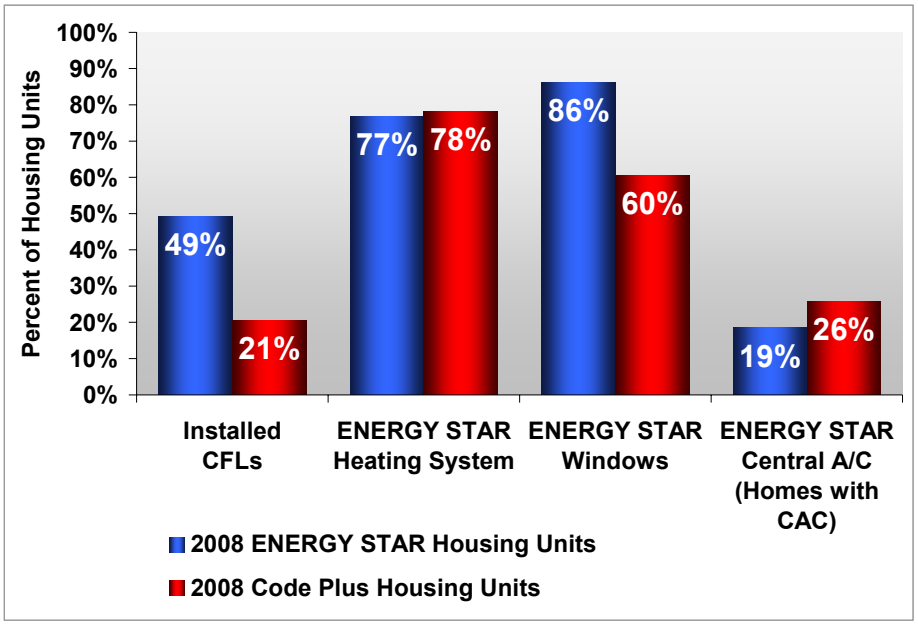
Figure 8-1: Percent of ENERGY STAR-Qualified Housing Units Installing ENERGY STAR Windows, Heating Systems, and Central Air Conditioning 2002 – 2008



9 ENERGY STAR-qualified versus Code Plus Homes

Figure 9-1 shows that virtually the same percentages of ENERGY STAR-qualified and Code Plus housing units installed ENERGY STAR heating systems in 2008, and Code Plus housing units with central air conditioning were more likely than ENERGY STAR-qualified housing units with central air conditioning to have ENERGY STAR air conditioning systems. At the same time, Code Plus housing units were much less likely than ENERGY STAR-qualified housing units to have installed free CFLs through the Program or have ENERGY STAR windows.

Figure 9-1: Comparison of 2008 ENERGY STAR versus Code Plus Housing Units Installing Free CFLs and ENERGY STAR Heating Systems, Windows and Air Conditioning



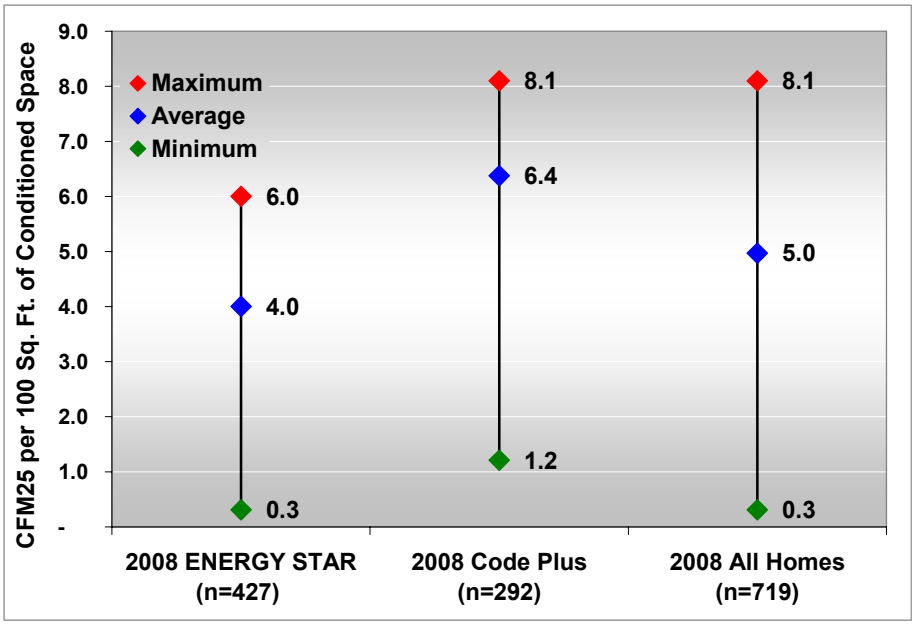
10 Duct Leakage

Standards for ENERGY STAR qualification require that ducts be sealed and tested to have leakage at or below 6 cfm25 to outdoors per 100 square feet of conditioned floor area. However, duct leakage testing is not required if all ducts and air handling equipment are in conditioned space and envelope leakage is 3 ACH50 or less. The majority of homes participating in the Program have ducts—98% of ENERGY STAR and 100% of Code Plus homes completed through the Program in 2008.

The Program encourages builders to install ducts in conditioned space and, based on findings from the 2005 Baseline study, it has been successful. In the 2005 Baseline Study, only 11% of the single family homes with ducts had all ducts installed in conditioned space. In 2007, 42% of all ENERGY STAR-qualified housing units had all ducts installed in conditioned space. In 2008, 77% of ENERGY STAR-qualified housing units and 64% of Code Plus housing units had all ducts installed in conditioned space. In addition, in 2008, 72% of the ENERGY STAR-qualified housing units and 45% of the Code Plus housing units with all ducts in conditioned space had envelope leakage of 3 ACH50 or less, which means duct leakage testing could be waived.

The average duct leakage in 2007 for ENERGY STAR-qualified housing units with ducts in unconditioned space was 4.3 cfm25 per 100 square feet of conditioned floor area. In 2008, duct leakage testing was required in 427 ENERGY STAR-qualified housing units and 219 Code Plus housing units that had ducts in unconditioned space or had ducts in conditioned space, but envelope leakage was greater than 3 ACH50. Figure 10-1 shows the average, minimum and maximum duct leakage measured in the 2008 housing units where duct leakage testing was required. As shown, duct leakage in ENERGY STAR homes requiring duct leakage testing ranged from 0.3 to 6.0 and averaged 4.0 cfm25 per 100 square feet of conditioned space, which is 0.3 lower than in 2007. Average duct leakage in 2008 Code Plus homes requiring testing is 6.4 and the average over all ENERGY STAR and Code Plus homes requiring testing is 5.0 cfm25 per 100 square feet of conditioned space.

Figure 10-1: 2008 Duct Leakage



11 Envelope Leakage

For many years the Massachusetts Program required housing units to have envelope leakage of 5 ACH50 or lower to be ENERGY STAR qualified—this is not a requirement of the national ENERGY STAR Homes Program performance path. In 2007, the Massachusetts Program dropped the envelope leakage requirement. Figure 11-1 shows the average, minimum and maximum ACH50 measured in Code Plus and ENERGY STAR housing units completed in 2008. As shown, and not surprisingly, average envelope leakage is lower in the groups of housing with lower HERS indices. Figure 11-2 shows the percentages of Code Plus and ENERGY STAR housing units with ACH50 greater than 5. As shown, 56% of Code Plus housing units, 31% of ENERGY STAR I housing units and 3% of ENERGY STAR II housing units with HERS indices over 50 have ACH50 greater than 5. All ENERGY STAR housing units with HERS indices of 50 or lower have ACH50 below 5.

Figure 11-1: Envelope Leakage (ACH50)

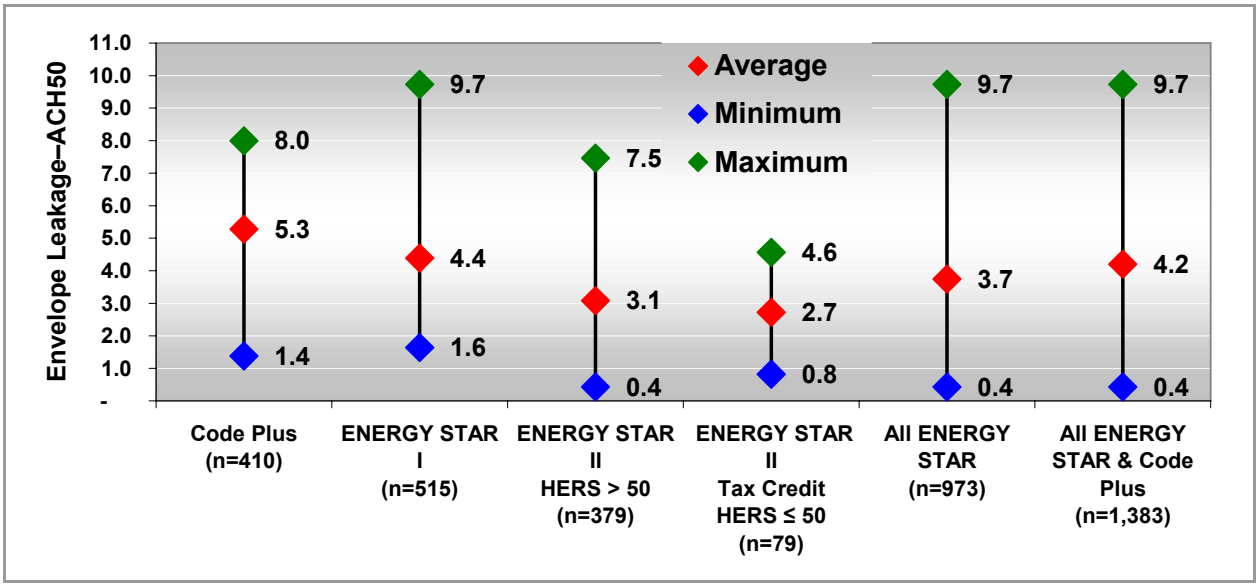
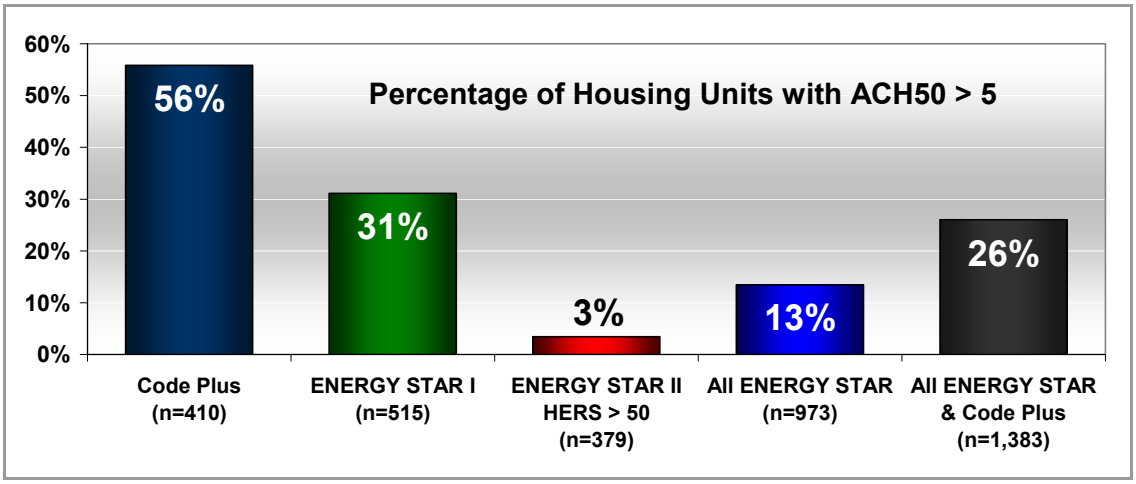


Figure 11-2: Percent of 2008 Housing Units with ACH50 Greater than 5



12 HERS Raters

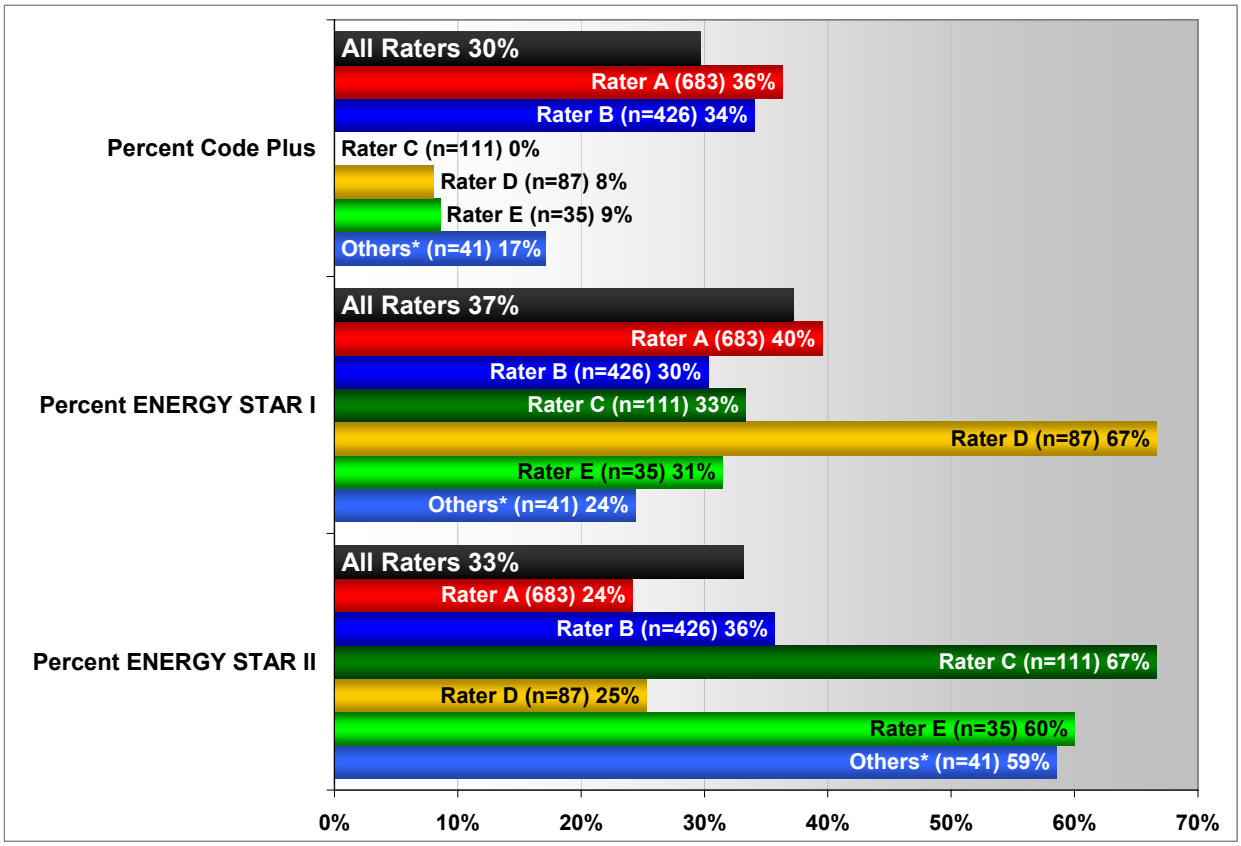
Eleven HERS rating companies participated in the Program in 2008. These HERS raters worked with builders that completed ENERGY STAR and/or Code Plus housing units and/or are working with new projects. Table 12-1 shows how many Code Plus and ENERGY STAR housing units each rater completed in 2008, the average HERS index of completed ENERGY STAR housing units and the number of housing units signed in 2008 that each rater is working with. The number of HERS raters working with participating builders is increasing and, as Table 12-1shows, includes a mix of small and large rating companies, offering builders a wide choice of raters. By HERS rater, the average HERS index for rated ENERGY STAR housing units ranges from 49 to 73.

Table 12-1: 2008 Participating HERS Raters

HERS Rater	2008 Completed Housing Units				2008 Signed Housing Units
	Code Plus	ENERGY STAR*	Total Housing Units	Average ENERGY STAR HERS Index	
Rater A	248	435	683	67	2,089
Rater B	145	281	426	64	1,603
Rater C	0	111	111	61	514
Rater D	7	80	87	73	266
Rater E	3	32	35	61	288
Rater F	0	22	22	63	0
Rater G	0	10	10	49	0
Rater H	7	0	7	NA	29
Rater I	0	1	1	70	2
Rater J	0	0	0	NA	62
Rater K	0	0	0	NA	1
Totals:	**410**	**972**	**1,382**	**65**	**4,854**

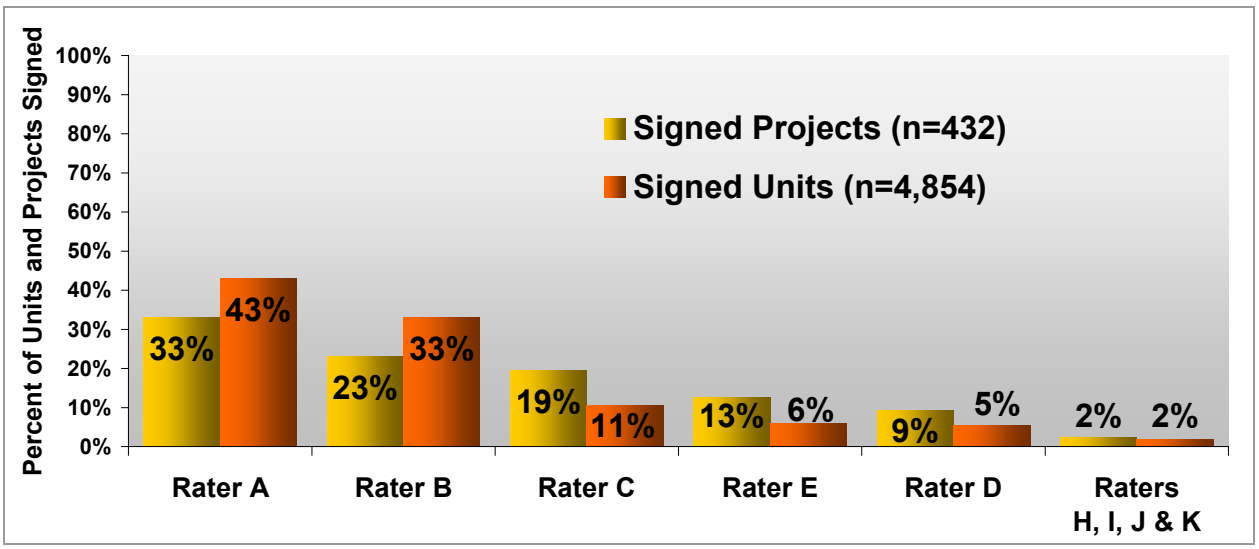
Figure 12-1 shows the percentage of housing units completed by each rater in 2008 that were Code Plus, ENERGY STAR I and ENERGY STAR II. Figure 12-2 shows the percentage of projects and housing units signed in 2008 that each rater is working with.

Figure 12-1: Rater Percentages of ENERGY STAR and Code Plus Housing Units



*Others includes raters F, G, H and I.

Figure 12-2: Percentages of Signed Projects and Units Raters Working With



RESIDENTIAL LIGHTING MARKDOWN IMPACT EVALUATION

FINAL

January 20, 2009

Submitted to:

Markdown and Buydown Program Sponsors in Connecticut, Massachusetts, Rhode Island, and Vermont

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1 Executive Summary

The purpose of this study was to provide updated information to the sponsors of markdown and buydown programs (hereafter markdown programs) in the New England states of Connecticut, Massachusetts, Rhode Island, and Vermont that would assist in their calculations of demand and energy savings for CFLs obtained through these programs (hereafter, markdown CFLs). Specifically, the report presents load shapes, coincidence factors, delta watts, daily and annual hours of use, and first-year and lifetime installation rates. Tasks completed toward the estimation of these parameters for calculating energy savings include:

- The development of a sample of markdown participants through a random digit dial (RDD) telephone survey
- An on-site survey and lighting inventory to gather information on factors related to lighting use (especially product placement and usage) and
- The logging of markdown CFLs installed in participating homes at the time of the on-site survey.

This executive summary summarizes the highlights and key findings of these activities.

It is important to note that the evaluation team designed the RDD survey and sampled homes for the on-site visits with the sole purpose of finding recently purchased and installed markdown CFLs. This reflects a directive from the sponsors; the fact that the evaluation team was under tight time constraints related to the timing of the kickoff meeting (October 19, 2007), the need to identify a panel of participants and install loggers in their homes in time for the winter peak lighting period, and the sponsors' requirement that we provide preliminary winter load shape and coincidence factor results by February 28, 2008 necessitated the use of this method. The survey questionnaire and sampling techniques explicitly eliminated households that did not have recently purchased markdown CFLs installed in the home. The RDD and on-site surveys, furthermore, included very few questions on demographics, housing characteristics, or other issues that may help explain some of the findings reported below (although we provide breakdowns when possible and relevant by such variables as the number of recently obtained markdown CFLs in the home). In short, this study focused on finding and logging a representative sample of markdown CFLs to obtain the necessary information to update demand and energy savings parameters. It was not designed to provide a representative sample of households—or even all markdown purchases—in the region, nor was it meant to provide detailed information on all factors that may affect lighting in the home.

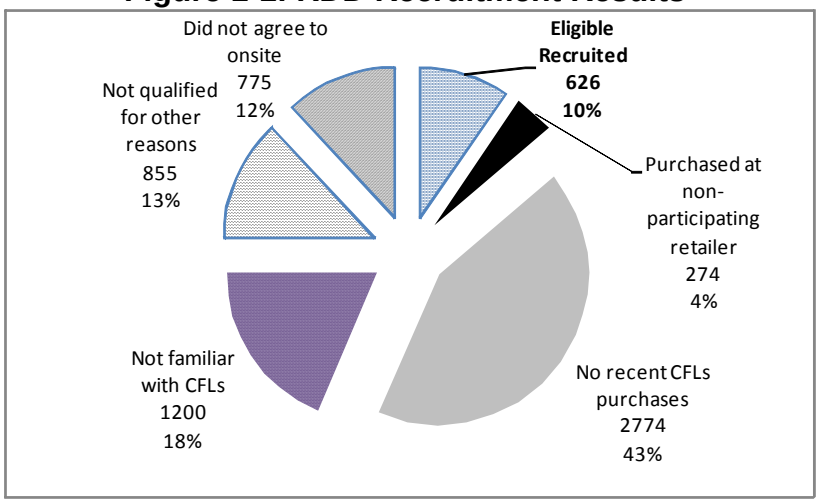
1.1 Task 2: Develop Sample of Product Purchasers (Chapter 3)

The NMR team relied on a brief RDD survey designed solely to determine if respondents had recently purchased and installed any markdown CFLs. We fielded the survey twice: the first from December 5 to December 16, 2007, to recruit households for the winter on-site logging panel, and the second in February 11 to March 10, 2008, to recruit households for the summer on-site logging panel. As soon as the interviewer could determine whether or not a respondentwas eligible for the on-site portion of this study and determined if the respondent was willing to do so, the call was terminated. The average respondent spent less than five minutes on

the phone. It is important to keep in mind that the panel season refers to when the products were *logged* and not when they were *obtained*. Respondents purchased products logged for the winter panel between August and early December 2007, while products logged in the summer panel were obtained between November 2007 and February 2008.

Figure 1-1 presents the results of the recruitment efforts. Overall, about 10% of the respondents surveyed were both eligible for the on-site study and willing to take part in it. The lack of any recent purchases (43%) served as the most common reason for exclusion from the on-site study. As discussed in more detail in Chapter 3, a slightly greater percentage of winter panel respondents were eligible for and willing to take part in the on-sites (12%) than summer panel respondents (9%).

Figure 1-1: RDD Recruitment Results

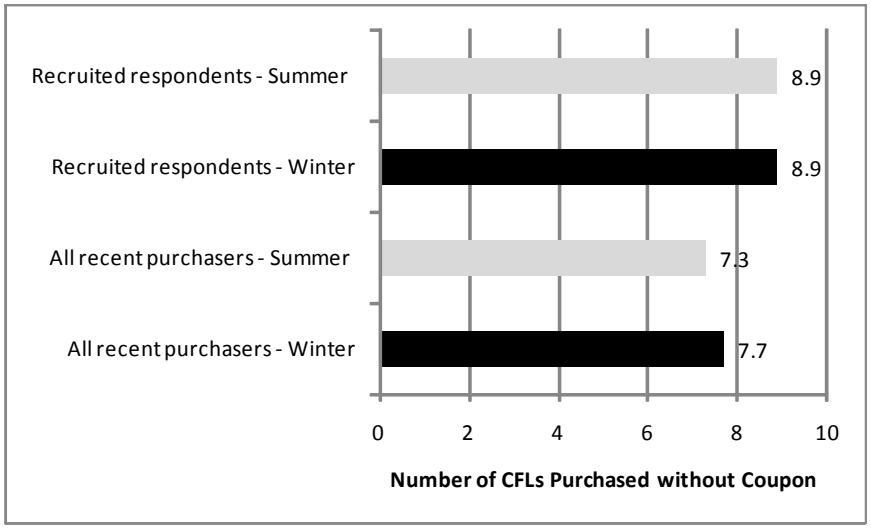


One of the screening questions asked respondents how familiar they were with CFLs. While 83% of winter panelists and 82% of summer panelists reported being at least 'slightly familiar' with CFLs, the percentage of summer panelist (70%) who stated that they were 'very familiar' with CFLs was significantly lower than among winter panelists (81%). Due to the nature of the recruitment survey, we did not collect information to help us explain this unexpected finding.[1]

[1] A reviewer voiced concern that awareness in this survey was lower than that estimated from a similarly worded question in the recent NMR (2008) *Telephone Survey Results for Market Progress and Evaluation Report (MPER) 2007 Massachusetts ENERGY STAR® Lighting Program.* The Massachusetts study suggested that familiarity was 89% (94% when descriptions of additional types of CFLs were included). We believe the discrepancy relates to the fact that the Massachusetts study included numerous call backs to boost response rates in an effort to represent the state population while the current survey focused less on response rates and more on getting people on the phone to find out if they had eligible products.

The data presented in Figure 1-2 show that 'recruited individuals'—that is, those who were eligible for and agreed to take part in the on-site—reported purchasing more CFLs in both the summer and winter panel than did all RDD survey respondents who had recently purchased CFLs. This suggests that recruited respondents may be more committed to CFLs than the other recent purchasers. While we did not collect information during the RDD survey to explore this question in more detail, the analyses reported in Chapter 4 examine such issues as the relationship between commitment to CFLs and the number of markdown CFLs found during on-site visits, as well as the type and age of home included in the on-site portion of the study.

Figure 1-2: Average Numbers of CFLs Purchased by Panel



The NMR team supplemented recruitment through the RDD survey by identifying households taking part in the New England measure life study who also had recent markdown purchases.[2] A total of 18 households were recruited into the current markdown study in this manner.

[2] NMR and RLW (2008) *Residential Lighting Measure Life Study*. Submitted June 10, 2008.

1.2 Task 4: Product Placement and Usage (Chapter 4)

After developing a sample of participants through the RDD survey, we created a sample design for the on-site visits that ensured we would visit homes in each load zone that had purchased various numbers of markdown CFLs. The design served only as a guide because the on-site conditions encountered by the technicians sometimes differed from what the respondent reported on the phone. Table 1–1 summarizes the disposition of products reported through the RDD survey, as well as additional recently purchased markdown products identified in the home that were not originally reported by the respondent during the RDD survey (i.e., the respondent forgot about them or obtained them between the RDD survey and the on-site visit). Differences observed between households recruited in the summer and winter panels are discussed in Chapter **Error! Reference source not found.**.

Table 1–1: Disposition of Products Reported as Purchased during RDD Phone Survey and All Qualified Markdown Purchases Found On-site

(Based on products found in homes identified through RDD survey)

Product Disposition	Overall	
	#	%
Markdown CFLs reported during phone survey (customer recall)	1,868	100%
RDD markdown CFLs reported and found	1,137	61%
RDD markdown CFLs reported but not purchased	703	38%
RDD markdown CFLs installed elsewhere	28	1%
All markdown CFLs found in home	1,544	100%
Markdown CFLs logged	1,073[a]	69%
RDD markdown CFLs logged	666	61%[a]
New markdown CFLs found and logged	407	38%[a]
Markdown CFLs eligible not logged	239	15%
Markdown CFLs in storage or removed	232	15%
Loggers placed in all homes	657	%

[a] Percentage based on the CFLs logged.

The markdown participants installed CFLs in a greater percentage of sockets (31%) compared to participants in the measure life study (27%) and the 2003 Residential Lighting Impact Study conducted for the sponsors in Massachusetts, Rhode Island, and Vermont (26%).[3] They also had a predisposition toward lower wattage lighting products, no matter what type of bulb was installed in the socket. Respondents who recently obtained eleven or more CFLs were the most likely to have a greater proportion of sockets devoted to CFLs and to have lower wattage lighting products installed throughout their homes. Such respondents, however, on average had a greater number of sockets in their homes. While we cannot explain this finding based on the data collected as part of this study, it may be that such respondents have more multiple-socket fixtures or circuits rated only for lower wattage products instead of a few higher-wattage fixtures.

[3] NMR and RLW (2008) *Measure Life.* NMR and RLW (2004) *Impact Evaluation of the Massachusetts, Rhode Island, and Vermont 2003 Residential Lighting Programs.* Submitted October 1, 2004.

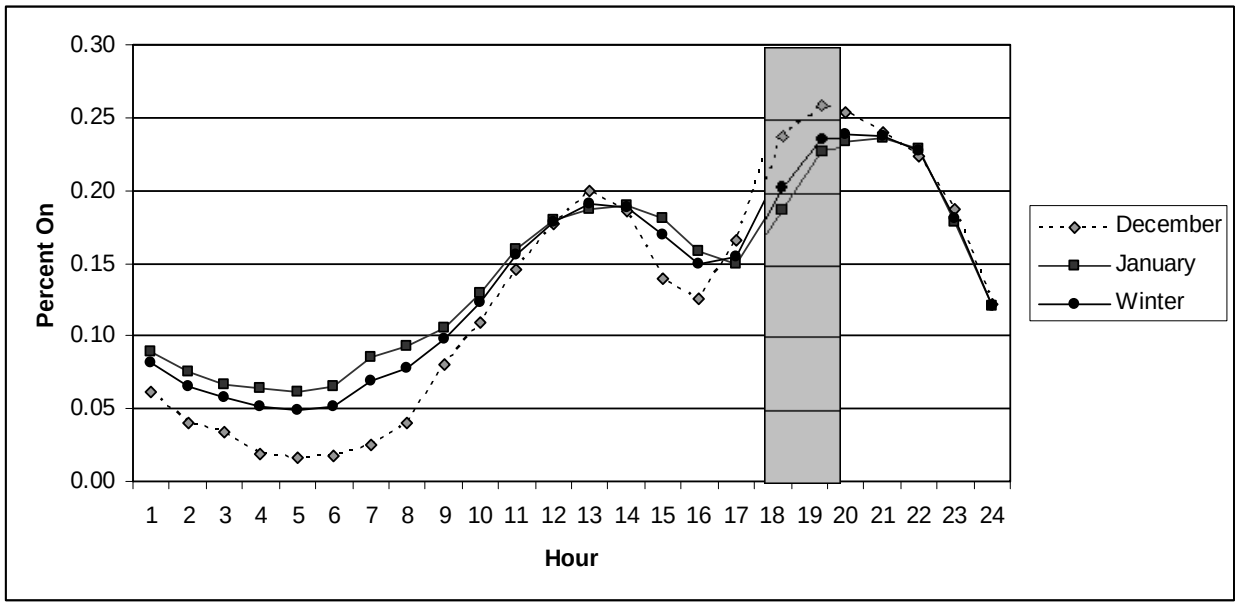
Alternatively, they may be installing lower-wattage products to reduce the electricity costs associated with having so many sockets in their homes.

1.3 Task 5: Energy and Demand Savings (Chapter 5)

This task involved the calculation and estimation of various parameters related to energy savings resulting from the use of markdown lighting products. Figure 1-3 and Figure 1-4 present the winter and summer lighting profiles and Table 1–2 summarizes the energy savings parameters, with related precision factors for the coincidence factors and 80% confidence intervals for all. Details on the development of these parameters as well as additional analyses and comparisons to other studies are presented in Chapter 5, but here we provide a simplified explanation of the data reported in Table 1–2.

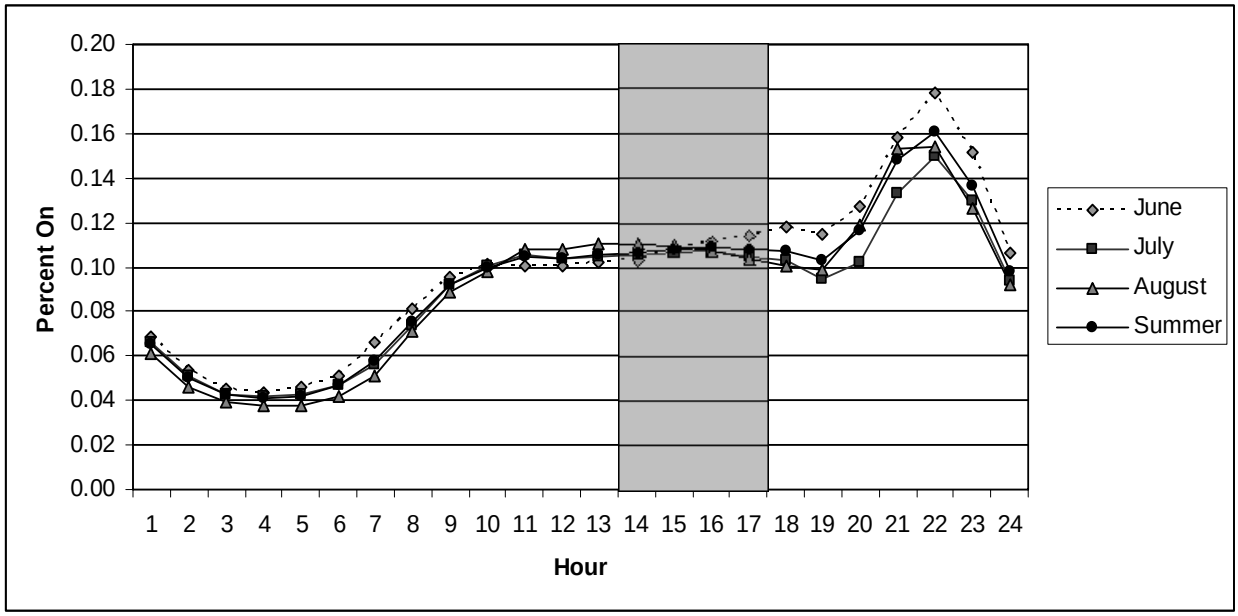
Coincidence factors are ratios that represent the percentage of CFL operation during a period of interest and are one component of the demand reduction calculation. The winter on-peak hours are during non-holiday weekdays from 5 PM to 7 PM. The summer on-peak hours are during non-holiday weekdays from 1 PM to 5 PM. Therefore, the operation of markdown CFLs coincides about 22% to 23% of the time with the period of peak electricity usage; in summer, the coincidence is around 11%. The other parameters in the table factor into the calculation of annual and lifetime energy savings. Average daily and annual hours of use are calculated from the amount of time the logger determined each markdown CFL was turned on. The typical change in watts is the average difference between the customer self-reported wattage of the bulb in place before the CFL was installed in the socket and the wattage of the CFL currently in the same socket. The first year installation rate denotes the percentage of markdown CFLs that get installed within a year of their purchase, while the lifetime installation rate is the percentage that will get installed at some point after the first year.

Figure 1-3: Winter Monthly and Average Lighting Profile[a]



[a] Results reported by the hour ending at the time listed.

Figure 1-4: Summer Monthly and Average Lighting Profile[a]



[a] Results reported by the hour ending at the time listed.

Table 1–2: Savings Estimation Parameters

Parameter	Estimate	Precision Factor	80% Confidence Interval	
			Low	High
Winter Coincidence Factor On-Peak	0.22	±10.2%	0.20	0.24
Winter Coincidence Factor Seasonal	0.23	±10.1%	0.20	0.25
Summer Coincidence Factor On-Peak	0.11	±5.8%	0.10	0.11
Summer Coincidence Factor Seasonal	0.11	±9.8%	0.10	0.12
Daily Hours of Use	3		3	3
Annual Hours of Use	1,022[b]		949	1,095
Typical Change in Watts	46		45	46
First Year Installation Rate	77%		75%	78%
Lifetime Installation Rate	97%		97%	98%

[a] Additional measures as well as estimates taken to a greater number of decimal places are reported in Table 6-1 in the full report.

[b] Calculated as 2.8 x 365 (2.8 is the more precise estimate). However, annual operating hours is listed as 1,010 in Table 5-15, with the difference being due to rounding error.

MASSACHUSETTS RESIDENTIAL APPLIANCE SATURATION SURVEY (RASS)

VOLUME 1: SUMMARY RESULTS AND ANALYSIS

Final

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EXECUTIVE SUMMARY

Five Massachusetts electric energy efficiency program administrators – Cape Light Compact, National Grid, NSTAR Electric, Unitil, and Western Massachusetts Electric Company (hereafter collectively referred to as "the Sponsors") – retained Opinion Dynamics Corporation to conduct a state-wide residential appliance saturation survey (RASS). The study effort consisted of a mail/Internet survey of close to 3,000 Massachusetts residential customers and an in-home verification of customer-provided data in 118 of the survey respondents' residences.

This report presents the findings of the survey and in-home verification efforts. The report consists of two Volumes:

- Volume 1 presents the methodology as well as summary results and analysis of the data collected in the 2008 Home Energy Survey and the in-home verification.
- Volume 2 contains the survey questions, as seen by the responding customer in the mail survey, and the detailed survey results by 1) electric energy efficiency program administrator, 2) building type of the residence, and 3) primary space heating fuel type of the residence.

One of the primary purposes of this study was to determine the penetration and saturation of Massachusetts homes with appliances and other energy using equipment. Key penetration and saturation data are presented in the table below. Other study findings, as well as comparison of results by different subgroups, are presented in Sections 1 through 14 of Volume 1.

Table 1. Summary of Appliance Penetration and Saturation
(Data adjusted by in-home visits is marked with "*")

Appliance/Equipment	Penetration	Saturation
Space Heating		
Space heating system	99%	--
Natural gas heat*	53%	--
Oil heat*	36%	--
Electric heat*	8%	--
Space Cooling		
Space cooling*	81%	--
Central air cooling*	29%	--
Room air conditioner	64%	126%
Water Heating		
Water heating system	98%	--
Natural gas heat*	57%	--
Oil heat*	24%	--

Appliance/Equipment	Penetration	Saturation
Electric heat*	16%	--
Insulation blanket	25%	--
Low-flow shower head*	68%	--
Faucet aerator*	57%	--
Laundry		
Clothes washer (private use)*	86%	--
Clothes dryer (private use)*	83%	--
Food Preparation		
Microwave oven*	95%	--
Indoor grill (electric)	32%	--
Dishwasher*	71%	--
Refrigerators and Freezers		
Refrigerator*	100%	128%
Freezer*	13%	14%
Entertainment Equipment		
Television*	99%	273%
CRT TV*	88%	197%
Flat panel LCD TV*	45%	69%
Flat panel plasma TV*	4%	7%
Projection TV*	3%	3%
DVD player or DVD/VCR*	83%	128%
Stereo*	75%	93%
Digital cable box*	61%	97%
VCR*	36%	45%
Home theater*	19%	20%
Home Office		
Computer*	82%	169%
Computer with flat panel monitor*	70%	139%
Computer with CRT monitor*	24%	25%
Telephone (landline)*	86%	255%
Cell phone	83%	148%
Answering machine*	79%	80%
Multifunction machine*	52%	59%
Printer*	37%	44%
Home network	24%	25%
Scanner*	8%	8%
Fax machine*	7%	7%

Appliance/Equipment	Penetration	Saturation
Copier*	3%	3%
Lighting		
Incandescent*	97%	--
CFL*	72%	--
Fluorescent tube lights*	60%	--
Halogen torchieres*	11%	--
Fluorescent torchieres*	7%	--
Miscellaneous Appliances		
Electric Clocks	82%	171%
Portable Fan	69%	119%
Ceiling Fan*	61%	147%
Dehumidifier*	50%	46%
Battery Charger	50%	80%
Humidifier*	33%	39%
Pond/Well/Pool Pump*	23%	22%
Electric Exercise Equipment*	20%	22%
Home Security System*	18%	19%
Cordless Vacuum	16%	17%
Electronic Household Air Cleaner	9%	12%
Attic or Whole-house fan*	8%	9%
Electric Whirlpool Spa*	7%	7%
Electric Water Heater for Pool*	3%	3%
Heated Waterbed*	2%	2%
Sauna-Electric*	1%	1%

INTRODUCTION

Five Massachusetts electric energy efficiency program administrators – Cape Light Compact, National Grid, NSTAR Electric, Unitil, and Western Massachusetts Electric Company (hereafter collectively referred to as "the Sponsors") – retained Opinion Dynamics Corporation to conduct a state-wide residential appliance saturation survey (RASS). The study effort consisted of a mail/Internet survey of close to 3,000 Massachusetts residential customers and an in-home verification of customer-provided data in a subset of survey respondents' residences. The field work was conducted by Mad Dash Incorporated under subcontract to Opinion Dynamics Corporation.

This report presents the findings of the survey and in-home verification efforts. This report consists of two Volumes:

Volume 1 presents summary results and analysis of the data collected in the 2008 Home Energy Survey and the in-home verification. Volume 1 is organized in three parts:

- **Introduction and Methodology:** These two sections provide background about the study and this report and present the data collection and analysis methodology.
- **Numbered sections 1 through 14:** These sections summarize and analyze the data collected in the study. The sections consist of graphs, tables, and brief descriptions of the most important findings summarizing. The 14 sections address the following study topics:
    - Section 1: Home Characteristics
    - Section 2: Space Heating
    - Section 3: Space Cooling
    - Section 4: Water Heating
    - Section 5: Building Shell
    - Section 6: Laundry Equipment
    - Section 7: Food Preparation
    - Section 8: Refrigerators and Freezers
    - Section 9: Entertainment Equipment
    - Section 10: Home Office
    - Section 11: Lighting
    - Section 12: Miscellaneous Appliances
    - Section 13: Energy Efficiency

  - Section 14: Profile of Respondents

- **Data Summary Tables:** Three sets of tables present study results by 1) electric energy efficiency program administrator, 2) building type of the residence, and 3) primary space heating fuel type of the residence. The tables are organized by the same topics used in the numbered sections of the report.

Volume 2 contains the detailed survey results, again organized by the same topics used in the numbered sections of Volume 1. Each section in Volume 2 begins with the survey questions, as seen by the responding customer in the mail survey.

METHODOLOGY

The residential appliance saturation survey consisted of a mail/internet survey of Massachusetts residential customers and an in-home verification of customer-provided data in a subset of survey respondents' residences.

Mail / Internet Survey

The mail survey was sent to 12,000 Massachusetts homes in October 2008. The survey pack consisted of a cover letter, a survey booklet, and a postage-paid return envelope. To enhance recognition and response rates, all written communications with customers were conducted on specially-designed stationary, displaying the logos of all five Sponsors. The cover letter included a reference to a website and a personal identification number (PIN), and offered customers the option to complete the survey on-line instead of by mail. The cover letter also announced a drawing of five $100 gift cards among respondents who returned the completed survey by the specified deadline.

Postcard reminders and a second copy of the survey booklet were sent to the entire sample in November 2008. After the response deadline had passed, brief follow-up calls were made to non-responding customers in survey strata that had not yet met their quota.

Sample Design

The survey sample was stratified by 1) electric energy efficiency program administrator; 2) heating fuel based on electric and non-electric rate codes; and 3) for NSTAR, by its three operating companies.

We estimated sample sizes for each stratum using a modified proportional approach. This approach consists of first allocating the sample of 12,000 surveys to each Sponsor based on the Sponsor's share of the total Massachusetts population. Proportional allocation of the overall sample resulted in precision levels of 10% or better (at a 90% confidence interval) for all Sponsors, except Unitil. Unitil's sample size was then increased to achieve a precision level of 7% (needed to achieve 10% precision levels for the substrata discussed below). To maintain an overall sample size of 12,000, the sample sizes of all other Sponsors were reduced in proportion to their total sample size.

We then allocated each Sponsor's sample to the Sponsor-specific substrata. This was again done using a modified proportional approach based on the number of customers in each substratum. For each Sponsor, the sample was allocated into "electric heat" and "non-electric heat" substrata. For all Sponsors except NGRID, the proportional allocation would not result in 10% precision for the "electric heat" stratum, so enough additional sample was allocated to the electric heat strata to achieve 10% precision. To maintain the overall sample size for the Sponsor, the sample size for the "non-electric heat" stratum was reduced accordingly. For NSTAR, the sample was further stratified by operating company: Boston Edison,

Commonwealth Electric, and Cambridge Electric Light. NSTAR's sample was first allocated among these three strata, and then among the "electric heat" and "non-electric heat" substrata. Again, a proportional approach was used, which was then adjusted to achieve 10% precision for each substratum.

Table 2 below summarizes, for each stratum and substratum, the population and sample sizes, the expected number of completed surveys (assuming a 25% response rate), and the expected precision levels (for a 90% confidence level).

Table 2. Summary of Sample Design

By Stratum	Population Size	Sample Size	Expected Completes *(25% resp. rate)*	Expected Precision *(90% CI)*
1 - National Grid	1,114,663	5,290	1,323	2.3%
1a - National Grid - Electric Heat	82,513	392	98	8.3%
1b - National Grid - Non-Electric Heat	1,032,150	4,899	1,225	2.3%
2 - NSTAR	795,360	3,775	944	2.7%
2a - NSTAR - Boston Edison - Electric Heat	45,744	268	67	10.0%
2b - NSTAR - Boston Edison - Non-Elec. Heat	565,493	2,360	590	3.4%
2c - NSTAR - Commwlth Electric – Elec. Heat	6,806	268	67	10.0%
2d - NSTAR - Commwlth Electric - Non-Elec. Heat	135,119	342	86	8.9%
2e - NSTAR – Camb. Elect. Light - Electric Heat	1,504	268	67	10.0%
2f - NSTAR – Camb. Elect. Light - Non-Elec. Heat	40,694	268	67	10.0%
3 - WMECO	182,203	865	216	5.6%
3 - WMECO - Electric Heat	21,428	268	67	10.0%
3 - WMECO - Non-Electric Heat	160,775	597	149	6.7%
4 - Cape Light Compact (CLC)	170,739	810	203	5.8%
4 - CLC - Electric Heat	19,355	268	67	10.0%
4 - CLC - Non-Electric Heat	151,384	542	136	7.0%
5 - Unitil	25,188	548	137	7.0%
5 - Unitil - Electric Heat	2,196	268	67	10.0%
5 - Unitil - Non-Electric Heat	22,992	280	70	9.8%
6 - Municipal Utilities	150,000	712	178	6.1%
TOTAL	2,438,153	12,000	3,000	1.5%

For each survey stratum, the sample was drawn at random from the Sponsors' customer databases to provide a statistically valid representation of the population. For the 40 Massachusetts municipal utilities, we purchased address information for customers living within the towns served by these utilities, in proportion to each utility's number of customers.

Summary of Mail Survey Statistics

Overall, 2,667 customers responded to the survey, 2,308 by mail and 359 via the Internet.

The survey responses were weighted to each stratum's population to ensure that all results are representative of the service provider and the Massachusetts population as a whole. For each sample stratum, sample weights were estimated as the ratio of the percentage of the population the stratum represents divided by the percentage of the completed surveys the stratum represents. For example, customers served by municipal utilities represent 6.15% of all Massachusetts customers (150,000 / 2,438,153; see Table 2) and 4.50 % of all survey responses (120 / 2,667; see Table 3). As a result, the sample weight for municipal utilities is 1.37 (6.15% / 4.50%).

Table 3 summarizes the mail survey statistics – including the actual number of completed surveys, the response rate, the achieved precision levels, and the sample weights – by sample stratum.

Table 3. Summary of Mail Survey

By Stratum	Actual Completes	Response Rate	Precision *(90% CI)*	Sample Weight
1 - National Grid	1,156	22%	2.4%	--
1a - National Grid - Electric Heat	96	25%	8.4%	0.94
1b - National Grid - Non-Electric Heat	1,060	22%	2.5%	1.07
2 - NSTAR	830	22%	2.8%	--
2a - NSTAR - Boston Edison - Electric Heat	64	24%	10.3%	0.78
2b - NSTAR - Boston Edison - Non-Elec. Heat	514	22%	3.6%	1.20
2c - NSTAR - Commwlth Electric – Elec. Heat	64	24%	10.3%	0.12
2d - NSTAR - Commwlth Electric - Non-Elec. Heat	85	25%	8.9%	1.74
2e - NSTAR – Camb. Elect. Light - Electric Heat	51	19%	11.5%	0.03
2f - NSTAR – Camb. Elect. Light - Non-Elec. Heat	52	19%	11.4%	0.86
3 - WMECO	204	24%	5.7%	--
3 - WMECO - Electric Heat	67	25%	10.0%	0.35

By Stratum	Actual Completes	Response Rate	Precision *(90% CI)*	Sample Weight
3 - WMECO - Non-Electric Heat	137	23%	7.0%	1.28
4 - Cape Light Compact (CLC)	224	28%	5.5%	--
4 - CLC - Electric Heat	75	28%	9.5%	0.28
4 - CLC - Non-Electric Heat	149	27%	6.7%	1.11
5 - Unitil	133	24%	7.1%	--
5 - Unitil - Electric Heat	64	24%	10.3%	0.04
5 - Unitil - Non-Electric Heat	69	25%	9.9%	0.36
6 - Municipal Utilities	120	17%	7.5%	1.37
TOTAL	2,667	22%	1.6%	--

Data Cleaning

Returned surveys were first screened for completeness. Twenty blank surveys (not included in the total count of 2,667 completed surveys) were set aside and excluded from further consideration. Completed surveys were then entered into a CATI database.

The primary data cleaning consisted of adjusting or eliminating contradictory responses. For example, if a customer did not respond to the question of how many refrigerators they have plugged in, but then provided characteristics for two refrigerators, we assumed that the response to the number of refrigerators should have been two. We generally did not override customer responses. In the example above, if the customer indicated that they have no refrigerator but then provided refrigerator characteristics, we excluded the refrigerator characteristics from consideration. Similarly, multiple responses to a single-response question, for example, two responses to "How old is your dishwasher?" were excluded from the analysis.

Questions that should have been answered but were left blank were treated as "No response." Such non-responses are identified in the detailed data tables in Volume 2, but they are excluded from the valid responses and any percentage calculations.

Data Analysis

All survey responses were analyzed for all Massachusetts customers as well as by four key variables: 1) energy efficiency program administrator, 2) building type of the residence, 3) primary space heating fuel type of the residence, and 4) income level. Two types of tests were conducted to determine the significance of differences observed between comparison groups: percentages were compared using the independent z-test for proportions/percentages; means were compared using the independent t-test for means (unequal variances). These tests were conducted at two levels of significance: 90% and 95%.

The two significance tests are used to test the hypothesis that an observed proportion or mean is the same for two different groups. For example, the z-test for proportions is used to test the hypothesis that the proportion of respondents using a specific fuel for their primary space heating system is the same for groups of respondents (example - by building type of the residence). High values of the z-test for proportions at a 90% or 95% level of significance constitute evidence against the hypothesis that the proportions are the same.

For readability purposes, the discussion of survey results in Volume 1 does not explicitly note levels of significance when comparing results between different respondent groups. However, differences are only pointed out when a statistically significant difference exists. The detailed data tables presented in Volume 2 use upper case letters to indicate significant differences between respondent groups at the 95% and lower case letters to indicate significant differences at the 90% level, as illustrated below.[1]

[1] Detailed data tables only include three of the four analyzed key variables: 1) energy efficiency program administrator, 2) building type of the residence, and 3) primary space heating fuel type of the residence.

	BUILDING TYPE				
	Total	Single-family	2-4 units	5+ units	Other
	(A)	(H)	(I)	(J)	(K)
Natural Gas	1,158	756	307	77	9
	49%	45%	66%	51%	38%
			HJK		
Electric	189	70	44	70	3
	8%	4%	10%	46%	14%
			H	HIK	
Oil	905	784	104	3	10
	39%	46%	23%	2%	42%
		IJ	J		iJ
Other	94	85	6	1	1
	4%	5%	1%	1%	6%
		IJ			
TOTAL VALID RESPONSES	2,346	1,695	462	152	23
	100%	100%	100%	100%	100%
TOTAL VALID RESPONSES (UNWEIGHTED)	2,367	1,638	476	215	24
Missing responses	27	8	13	6	-
	1%	*%	3%	4%	
			H	H	
TOTAL RESPONSES	2,373	1,703	474	158	23

Customers in multi-family residences of 2-4 units are significantly more likely to use natural gas as their primary space heating fuel than customers living in other types of residences.

Customers in single family homes are significantly more likely to use oil as their primary space heating fuel than customers living in multi-family residences.

Comparison Groups: HIJK
Independent T-Test for Means (unequal variances), Independent Z-Test for Percentages
Upper case letters indicate significance at the 95% level.
Lower case letters indicate significance at the 90% level.

In addition to the three key variables noted above, survey results were also analyzed by other customer or home characteristics of interest, such as income, age of the home, or awareness of the ENERGY STAR® label. Such comparisons are noted, where interesting or relevant results have been observed.

Penetration and Saturation

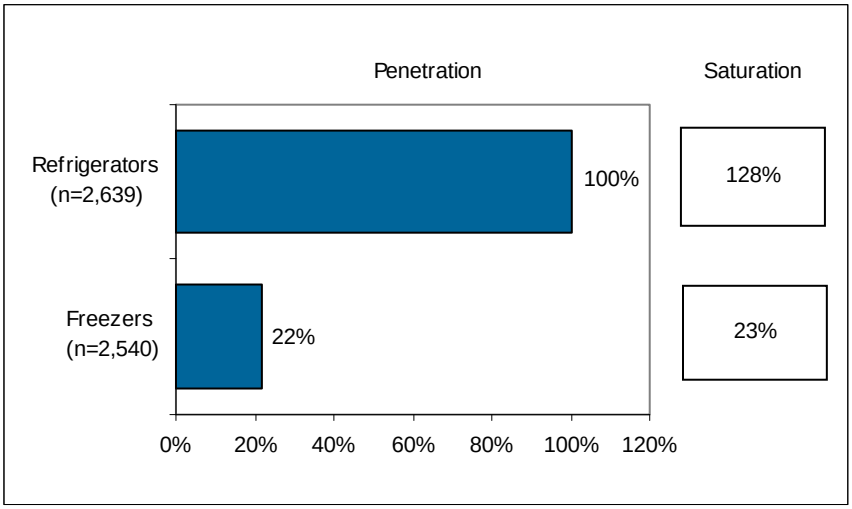
A primary purpose of this study was to determine the penetration and saturation of Massachusetts homes with key appliances. These two concepts are defined as follows:

- **Penetration:** A percentage representing the proportion of customers that have one or more particular appliance (or other piece of equipment). It is calculated by dividing the number of customers with one or more of an appliance (or other piece of equipment) by the total number of customers responding to that question.
- **Saturation:** A percentage representing how many of a particular appliance (or other piece of equipment) exist among all customers. It is calculated by dividing the total number of a particular appliance (or other piece of equipment) by the total number of customers responding to that question. This percentage is at least equal to, but generally higher than the corresponding penetration of a

particular appliance, because some households will have more than one of the appliance.

In this report, penetration levels are generally displayed as bar graphs with saturation levels, where available, presented in a separate column to the right of the penetration graph, as shown in the example below.

Figure 1: Example of Penetration and Saturation Figure



In-Home Verification

There is always potential measurement error from the mail survey because respondents could have misunderstood the questions in the survey or not known the answers. To reduce this possible error, we chose to conduct site visits at a subset of the respondent homes to verify the data from the mail survey. This in-home verification occurred by trained technicians. Because we felt that there would be no difference in errors people may have made regardless of their service territory or house characteristics, we chose the sites randomly from the completed surveys. Ultimately we verified the survey responses from 118 homes.

Data Adjusted

We used data from the verification to adjust the mail surveys to the extent practicable. However, we did not adjust all items. Items we did not adjust include:

- **Questions about customer behavior**, e.g., "How many dishwasher loads are run in a typical week?" Behavioral questions were not verified since the technicians could not observe the answer.
- **Questions about equipment age.** In most cases, the technicians could not reliably determine the age of equipment. As a result, we decided not to adjust this information.

- **Questions with low incidence in the verification sample.** Some questions explore details of appliances that few customers own. Where the incidence of an appliance type was low, we did not adjust the responses to questions about the characteristics of the appliance. An example is stand-alone freezers, which only 13% of Massachusetts households own.

Below are the survey questions we did adjust, by report section. The number in parentheses indicates the question number in the mail survey (see Volume 2 for the complete set of survey questions).

1. Home Characteristics
Type of residence (A1)
Number of rooms (A5)
Natural gas line (A11)

2. Space Heating
Have space heating (B1)
Primary heating system type (B2A)
Use/type of secondary heating (B2B)
Number/type of thermostats (B5)

3. Space Cooling
Have central air cooling (C1)
Percent of space cooled (C2)
Number/type of central air cooling (C3)
Number/type of thermostats (C5)
Age of room air conditioners (C7A)
Size of room air conditioners (C7B)

4. Water Heating
Have water heating (D1)
Primary heating system type (D2A)
Use of secondary heating (D2B)
Have low flow shower heads (D5)
Have water-saving faucets (D6)

5. Building Shell
Thickness of attic/ceiling insulation (K3)
Type of windows (K4)
Type of window frames (K5)

6. Laundry
Private use of laundry (E1)
Type of clothes washer (E3)
Have clothes dryer (E7)
Type of clothes dryer (E7)

7. Food Preparation
Type of stovetop/range (F1A)
Age of stovetop/range (F1B)
Have microwave oven (F2)
Have dishwasher (F4)

8. Refrigerators and Freezers
Number of refrigerators (G1)
Refrigerator characteristics (G2)
Number of freezers (H1)

9. Entertainment Equipment
Number/type of TVs (I1)
Number/ type of audio/TV accessories (I5)

10. Home Office
Number/type of computers (I6)
Number/type of other office products (I10)

11. Lighting
Number/type of lighting products (J1)

12. Miscellaneous Appliances
Number/type of appliances (L1)

Adjustment Methodology

We used the ratio adjustment method to adjust the mail survey responses for the items listed above.[2] This method first develops an adjustment factor, based on value of the 118 in-home visits and the value from the survey responses of the same 118 households. The adjustment factor is then multiplied by the value from the survey responses for all 2,667 households. The values to be adjusted can be either a mean or a proportion.

Figure 2 shows this two-step ratio adjustment method.

Figure 2. Ratio Adjustment Algorithm

Step 1: $$Adjustment\ Factor = \frac{\overline{X}_o}{\overline{Y}_o}$$

Step 2: $$\overline{Y}_{sa} = Adjustment\ Factor * \overline{Y}_s$$

Where:

Y_{sa} = adjusted mean/proportion for the item
X_o = mean/proportion from the 118 in-home visits
Y_o = mean/proportion from the survey responses for the 118 households with in-home visits
Y_s = mean/proportion from the survey responses for all 2,667 households

Consider the following example:

The in-home visits found that 95% of refrigerators are frost free and 5% are manual defrost. By contrast, the mail survey responses provided by the same 118 households reported that 90% of refrigerators are frost free while 10% are manual defrost.

Using these values, we first develop the adjustment factors for frost-free refrigerators and manual defrost refrigerators, as follows:

Frost-free refrigerators: $$Adjustment\ Factor = \frac{95\%}{90\%} = 1.06$$

Manual defrost refrigerators: $$Adjustment\ Factor = \frac{5\%}{10\%} = 0.47$$

All mail survey respondents reported that 91% of refrigerators are frost free while 5% are manual defrost. Multiplying the adjustment factors by the proportions reported by all survey respondents yields:

Frost-free refrigerators: $$Adjusted\ Value = 91\% * 1.06 = 96\%$$

[2] Judith T. Lessler and William D. Kalsbeek. Nonsampling Error in Surveys. 1992. p. 269.

Manual defrost refrigerators: $Adjusted\ Value = 9\% * 0.47 = 4\%$

When adjusting proportions, one has to be careful about how to use the results. When the data is categorical data, as in the example above, each category is adjusted separately. As a result, in many cases, the individual proportions no longer add up to 100%. In the example above, displaying the results to the first decimal would show that the adjusted proportion of frost-free refrigerators is 96.2% while the adjusted proportion of manual defrost refrigerators is 4.3%, for a total of 100.5%.

To correct for this, when adjusting categorical data in this report, we rebased the adjusted proportions to sum to 100%. Rebasing consists of dividing each adjusted proportion for a single question by the sum of all adjusted proportions. In this case, the rebasing would look as follows:

Frost-free refrigerators: $Rebased\ Value = \frac{96.2\%}{100.5\%} = 95.8\%$

Manual defrost refrigerators: $Rebased\ Value = \frac{4.3\%}{100.5\%} = 4.2\%$

In this example, rebasing the adjusted proportions does not change the final values, when presented as a whole number. However, in other cases it might.

Table 4 summarizes the data inputs and results of these adjustment calculations.

Table 4. Adjustment Example

	Frost-free	Manual Defrost
Onsite results ($X_{o)}$	95%	5%
Mail results for onsite HH (Y_o)	90%	10%
Adjustment Factor	1.06	0.47
Mail results for all surveys (Y_s)	91%	9%
Adjusted Mail results for all surveys (Y_{sa})	96.2%	4.3%
Rebased-Adjusted Mail results for all surveys	95.8%	4.2%

Use of Verification Work in this Report

This report incorporates the results of our verification work in two ways:

1. **Volume 1 data summary tables.** Adjustment factors for the questions presented above are included in the data summary tables at the end of Volume 1. As demonstrated in the example above, adjustment factors for categorical data cannot be used in isolation. As a result, the adjustment factors in the data summary tables should be considered an indication of the magnitude of the adjustment resulting from the in-home visits. ***Adjustment factors should not be directly applied to the percentages presented in the tables, unless all categories are adjusted and rebased.***

2. **Volume 1 Sections 1 through 14.** In the numbered sections that follow this methodology section, mail survey data were adjusted – using the developed adjustment factors – and rebased. Adjusted data are annotated by "(adj.)". It should

be noted that the sample size for the onsite audits (118) was insufficient to develop separate adjustment factors for subgroups of interest (such as by program administrator, building type, primary fuel type, or income category). Therefore, when adjusting results that are presented by subgroup, a single adjustment factor was used across all groups. While there is no reason that subgroups should differ in their ability to provide correct answers to the mail survey, any such differences might lead to different results.

3. **Volume 2.** The data presented in Volume 2 were ***not*** adjusted. The Volume 2 tables therefore show the self-reported data based on the mail survey, which might differ from the adjusted results presented in Sections 1 through 14.

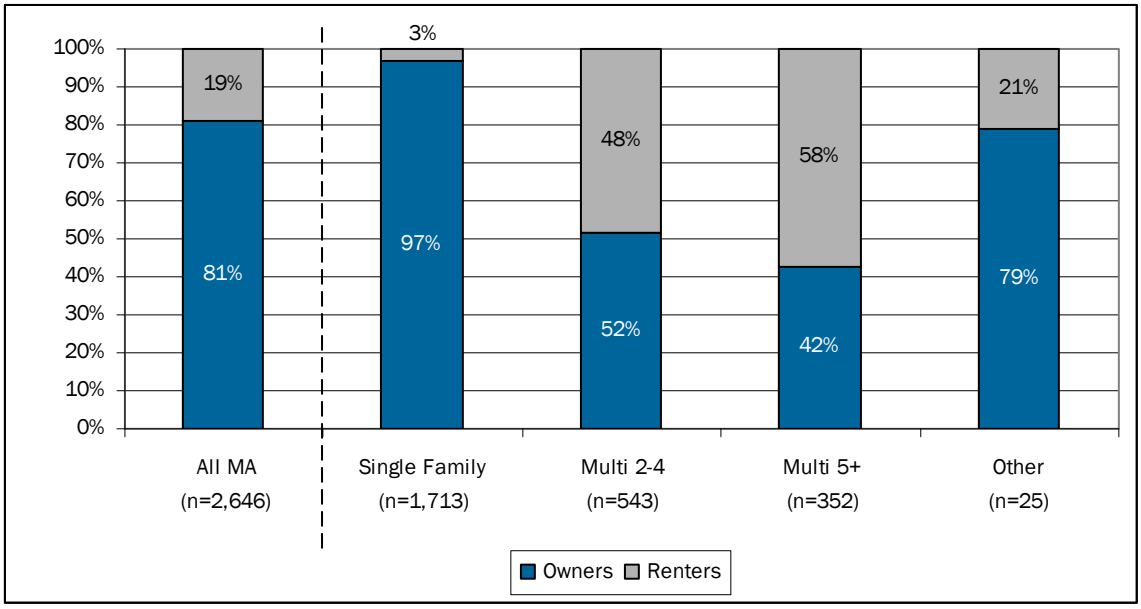
1. HOME CHARACTERISTICS

Home Ownership

Over 80% of Massachusetts residential customers own their home or current residence. Not surprisingly, customers living in single family homes are much more likely to own their home (97%) than customer living in multi-family or other residences.

Residents who use natural gas or oil heat are more likely to be amongst this group of homeowners than those with electric heat. In addition, customers served by Cape Light Compact and municipalities are more likely to be homeowners than those served by other providers. Not surprisingly, low income customers are more likely to rent their home.

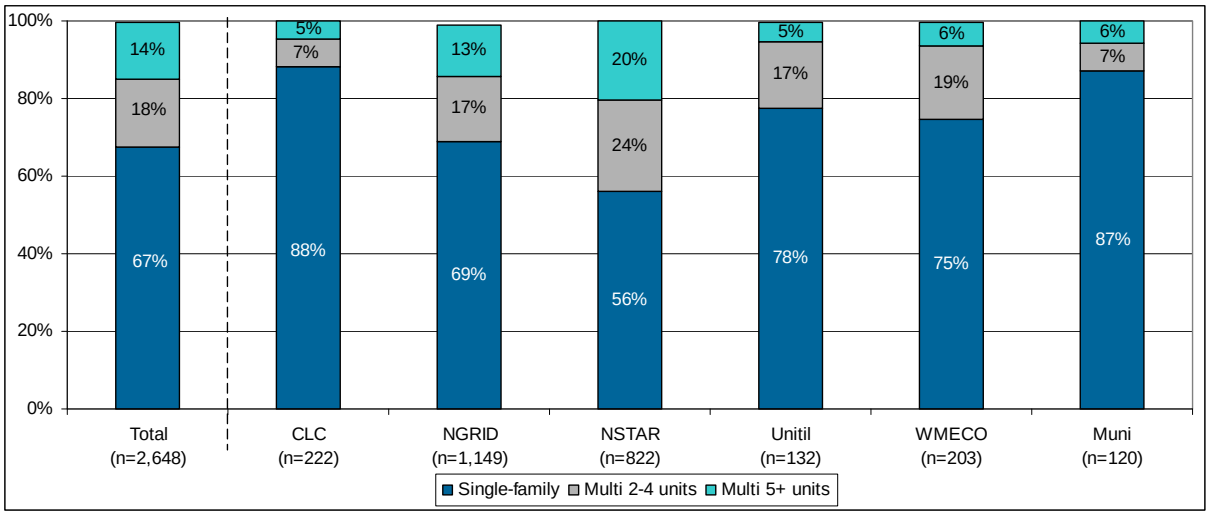
Figure 3. Home Ownership by Building Type



Type of Residence

Sixty-seven percent of customers live in single family homes (adj.). The remaining 33% are divided between multi-family residences with two to four units (18%), multi-family residences with five or more units (14%), and other types of residences (1%). Given that Cape Light Compact and municipalities have the highest percentage of homeowner customers, it is not surprising that they also have the largest percentage of single family customers of all service providers. Low income customers more often live in multi-family residences than other Massachusetts customers.

Figure 4. Type of Building (Adj.)



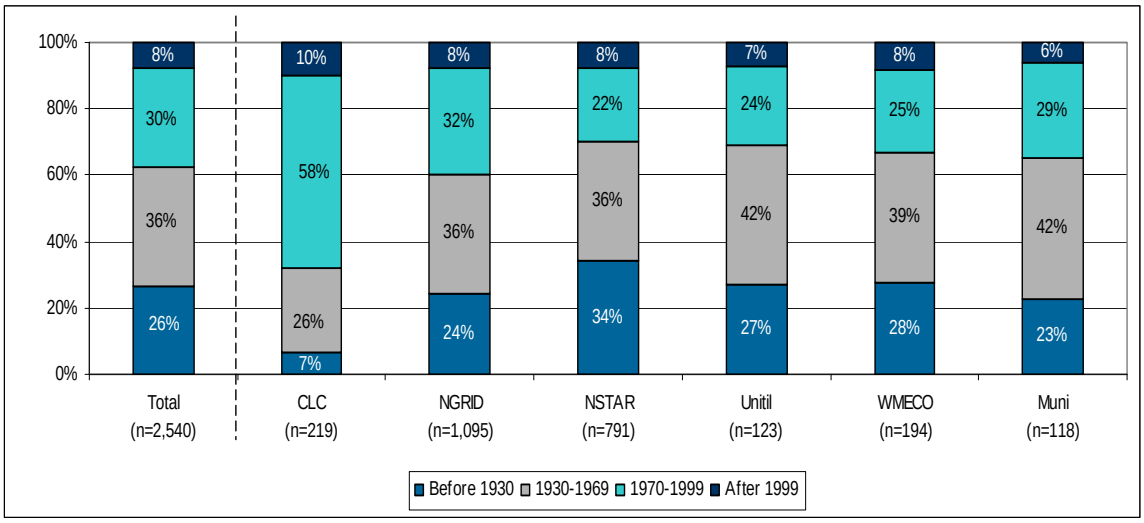
Ninety-three percent of respondents completed the survey for a permanent residence. Cape Light Compact is the only service provider with a substantial percentage of customers (41%) completing the survey for a seasonal or partial-year residence. A majority of partial-year residents use their homes during the summer months of June (87%), July (92%), August (92%), and September (83%).

Size and Age of Residence

Massachusetts residents have an average of 6.7 rooms in their residences (adj.),[3] making up an average of 1,866 square feet of living space. A majority of these homes are older residences with 26% built before 1930, 36% between 1930 and 1969, 30% between 1970 and 1999, and only 8% built after 1999. Homes of Cape Light Compact customers tend to be newer than those of other Massachusetts customers. Low income customers are more likely to live in homes built before 1970 than non-low income customers.

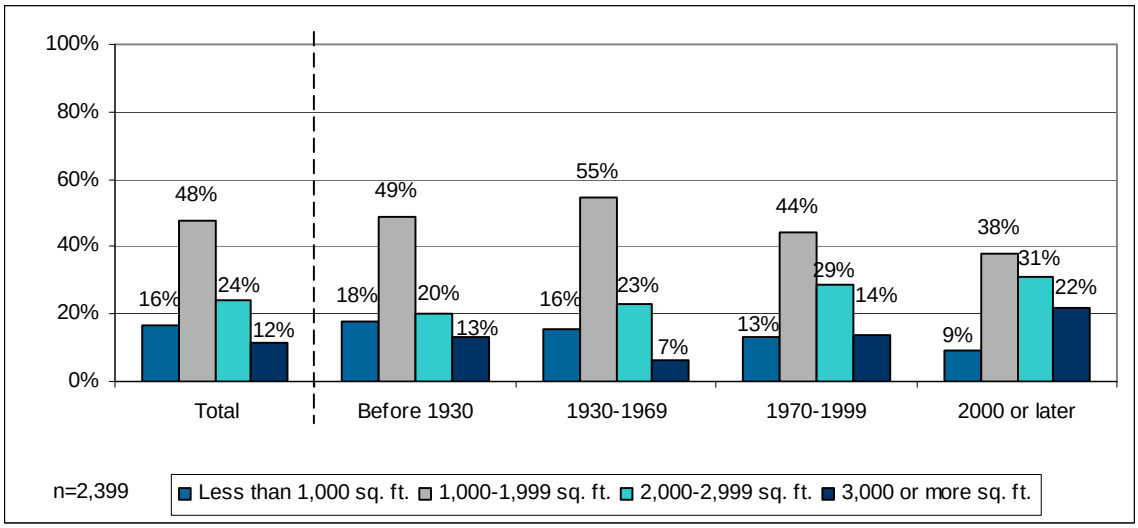
[3] The count of rooms excludes bathrooms, halls, pantries, unheated rooms, and garages.

Figure 5. Year Residence was Built, by Provider



The number of homes built with fewer than 1,000 square feet has decreased consistently across the years. Homes built since 2000 are more likely to be larger homes, with 3,000 or more square feet.

Figure 6. Size of Residence, by Year Residence was Built

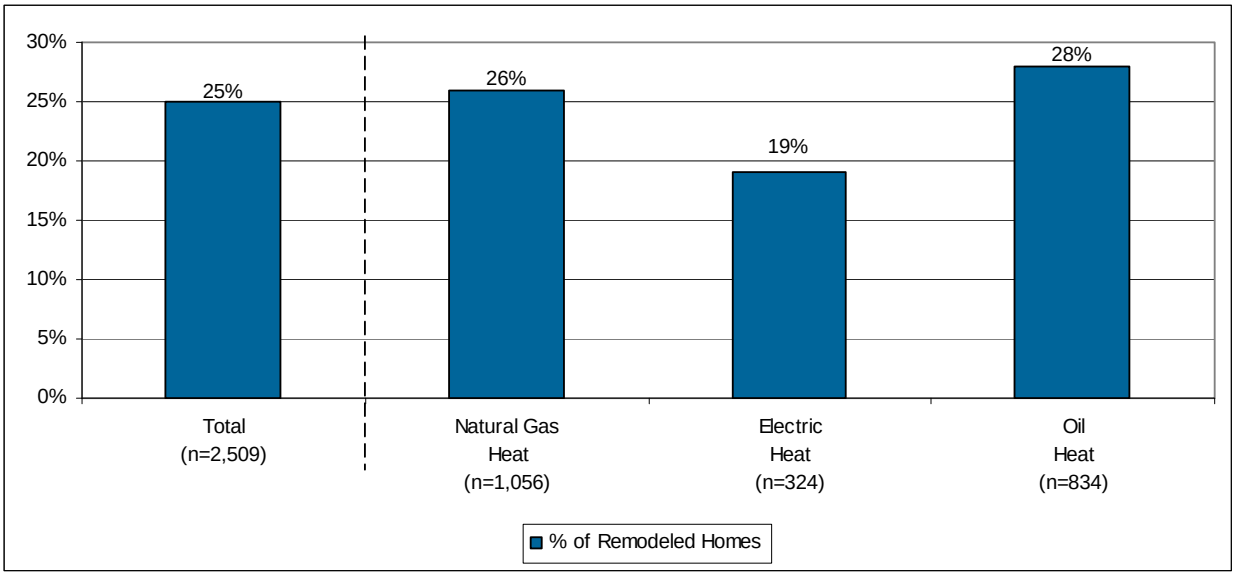


Approximately 61% of residences have a natural gas line to their home (adj.).

Incidence of Remodels

Twenty-five percent of customers remodeled their residence within the past three years.[4] Residences heated with natural gas and oil had a higher percentage of remodels than those with electric heat.

Figure 7. Percentage of Homes Remodeled in the Past 3 Years, by Heating Type



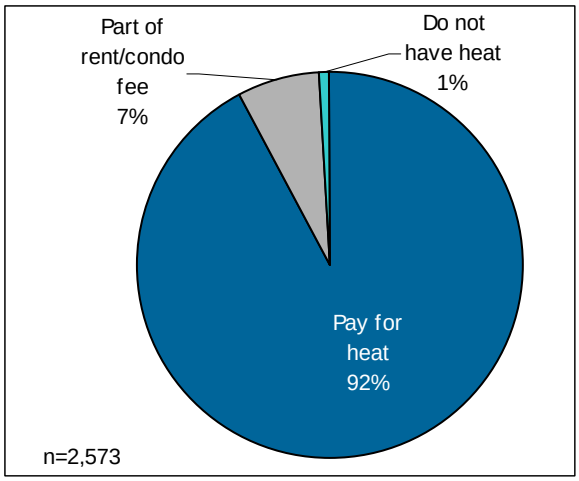
Most remodels were done to kitchens or bathrooms (63%); other remodels include adding a room or square footage (20%), finishing a basement (14%), and rebuilding most of the home (14%). While 14% of additions are not heated, those that are heated tend to be heated by extending the existing heating system (63%).

[4] Remodeling activities included in the survey include (1) adding a room or square footage to the home, (2) converting a basement to finished space, (3) remodeling the kitchen or bathroom, (4) rebuilding most of the home.

2. SPACE HEATING

Ninety-two percent of Massachusetts residential customers pay to heat their home. Seven percent of customers have heat included in their rent or condo fee, and less than 1% report that the home for which they completed the survey is not heated. National Grid and NSTAR customers are more likely than other Massachusetts customers to have heating costs included in their rent or condo fee, reflecting the fact that they more often live in multi-family residences of five or more units.

Figure 8. Penetration of Space Heating Systems



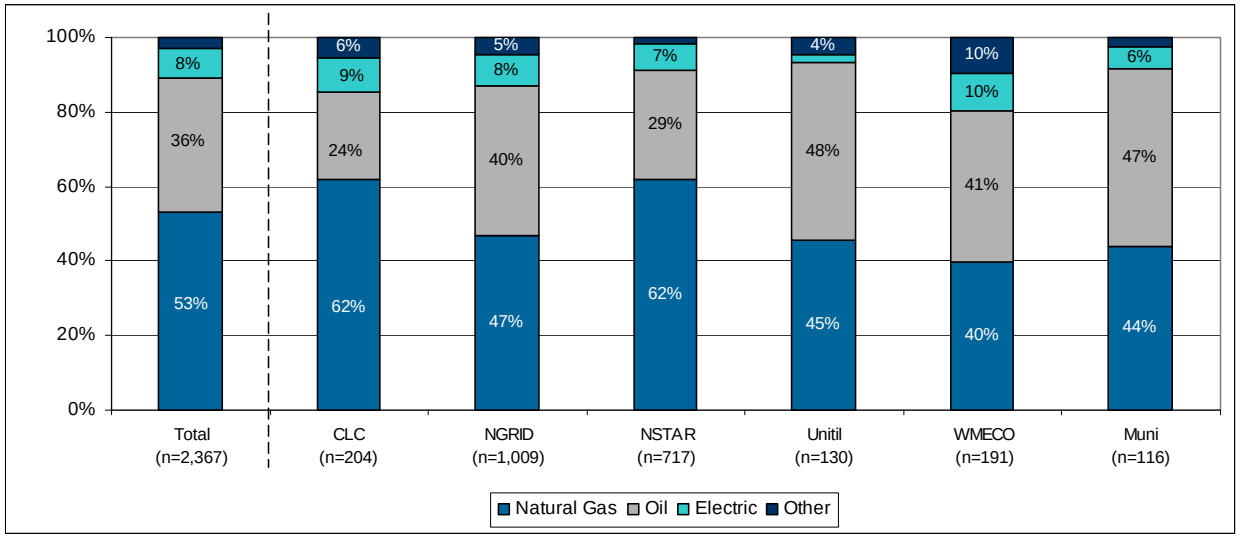
Primary Heating Fuel

Of customers who pay to heat their homes, 53% use natural gas as their primary heating fuel while 36% use oil (adj.). Only 8% use electricity as their primary source of heat (adj.).

CLC and NSTAR customers are more likely to use natural gas to heat their homes than customers of other electric service providers.[5] Conversely, customers of National Grid, Unitil, and WMECO are more likely to use oil to heat their homes than CLC and NSTAR customers.

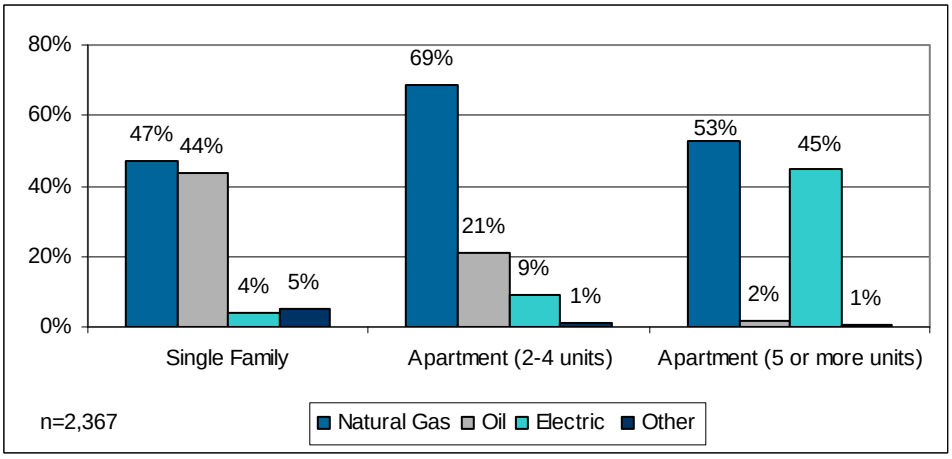
[5] Note that not all Massachusetts communities have the availability of natural gas.

Figure 9: Primary Heating Fuels by Provider (Adj.)



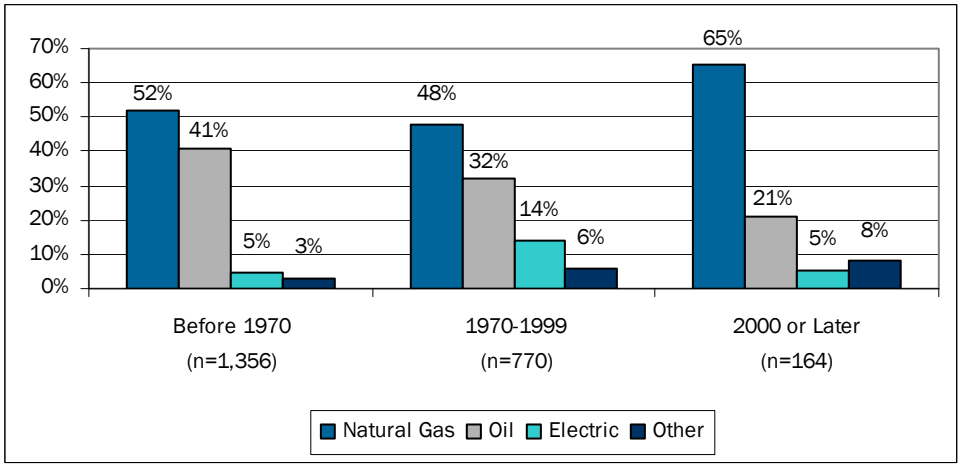
The prevalence of primary heating fuel types varies somewhat with the type and age of the home. Customers who live in single family homes are more likely have an oil system, customers who live in residences with two to four units are more likely to have a natural gas system, and customers who live an apartment building with five or more units are more likely to have an electric heat system.

Figure 10. Primary Fuel Type by Building Type (Adj.)



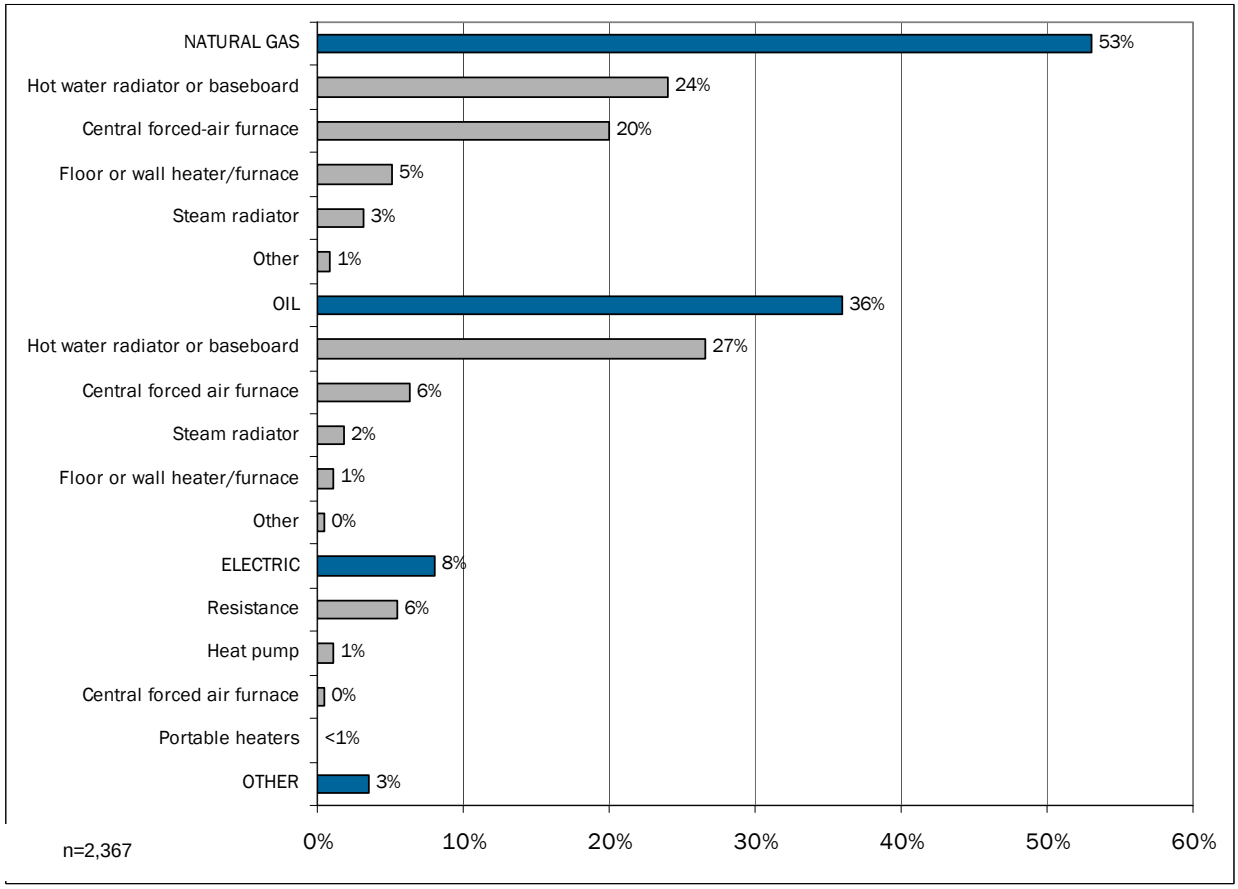
Across three age ranges (before 1970, between 1970 and 1999, and 2000 or later), natural gas is the most common primary heating fuel type. However, natural gas heating is most prevalent in newer homes (built in 2000 or later). Conversely, oil heat is more common in older homes (built before 1970), and electric heat is more common in homes built between 1970 and 1999.

Figure 11. Primary Heating Fuel by Age of Home (Adj.)



Most natural gas customers have either hot water radiator/baseboards or a central forced-air furnace. Over half of oil customers have hot water radiator/baseboards, and almost three-quarters of electric customers use a resistance heating system.

Figure 12. Heating System Types by Fuel Type (Adj.)

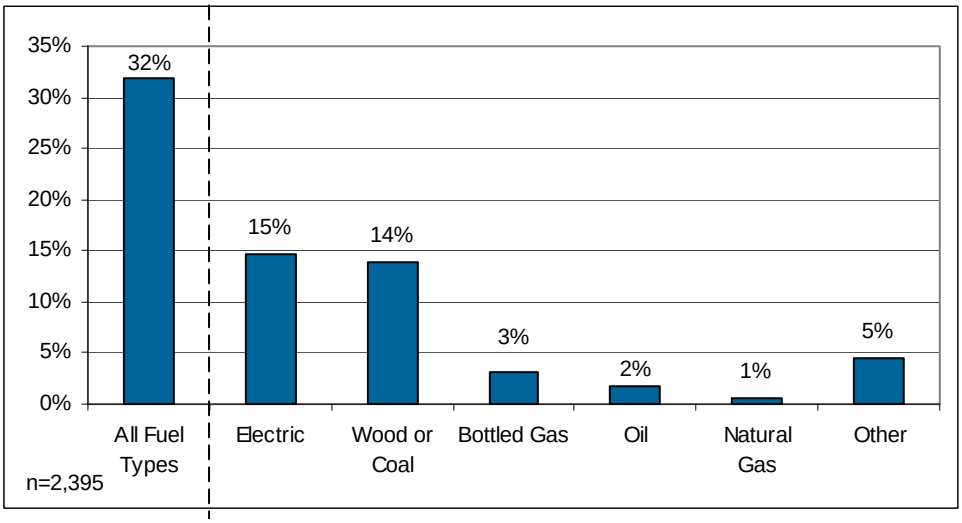


Additional Heating Systems

Nearly one-third of Massachusetts residential customers report using a secondary heating system. Most additional heating systems are electric or consist of wood/coal stoves or fireplaces. Customers in homes where oil is the primary heating fuel are more likely to have an additional heating system than other Massachusetts customers. Low income customers are less likely to have an additional heating system.

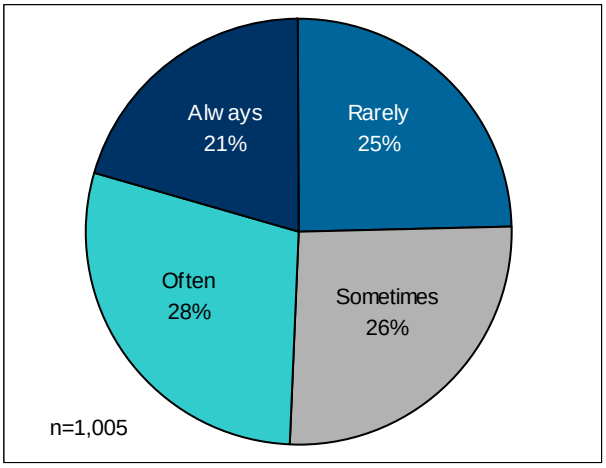
NSTAR customers, customers that live in an apartment building with five or more units, and customers with natural gas as a primary fuel type are more likely to have an electric secondary heating system. Unitil customers, customers that live in single family homes, and customers that use either oil or electricity as their primary heating fuel are more likely to use a wood/coal stove or fireplace for additional heating.

Figure 13. Fuel Types of Additional Heating Systems



Use of additional heating systems among Massachusetts customers varies. Almost equal shares of customers rarely (once per month), sometimes (once per week), often (2-4 days per week), and always (5-7 days per week) use their additional heating system during the heating season.

Figure 14. Use of Additional Heating System



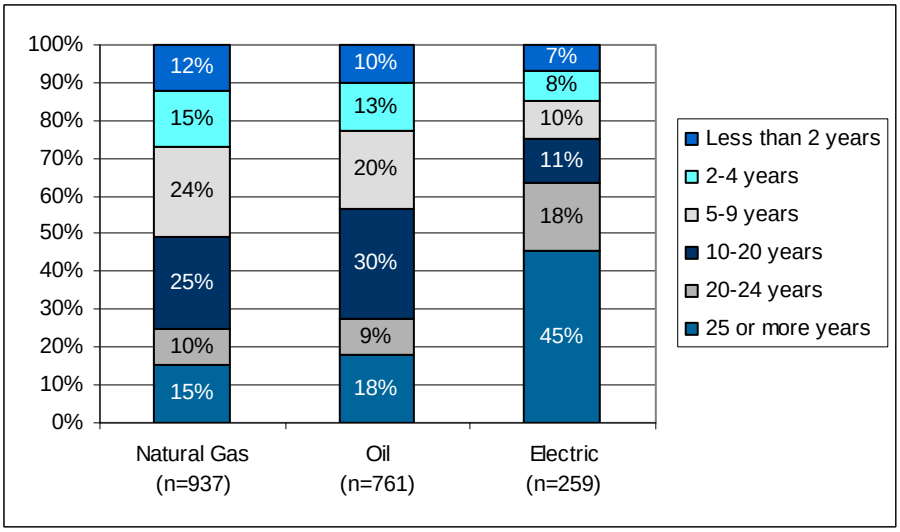
Age of Primary Heating System

The average age of customers' primary heating systems is 12.3 years. Eleven percent of customers report that their heating system is less than two years old, while 18% of customers have a heating system that is 25 or more years old.

In general, electric heating systems are older (18.0 years) than oil systems (12.6 years) and natural gas systems (11.5 years). Sixty-three percent of electric heating systems are 20 years or older.

Homes built between 1970 and 1999 have the oldest heating systems (14.2 years), compared to those built before 1970 (12.6 years) and those built after 1999 (4.3 years), reflecting more recent replacements of heating systems in the oldest homes.

Figure 15. Age of Main Heating System

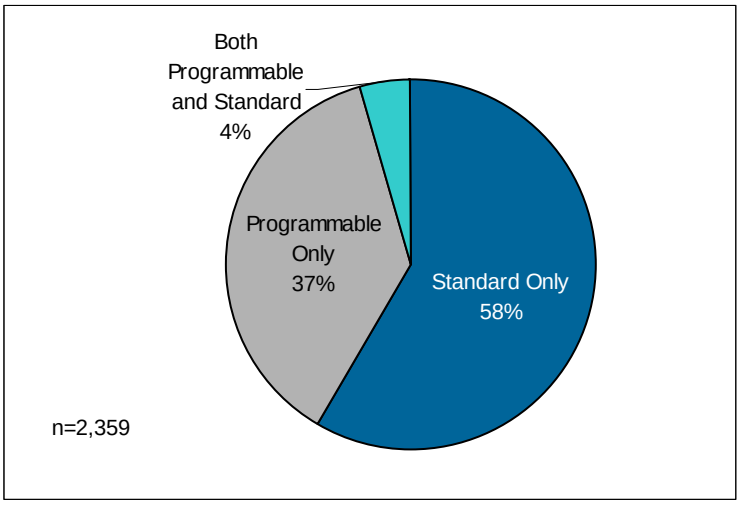


Thermostats

Ninety-five percent of customers have at least one thermostat for their heating system, with an average of 1.7 thermostats per home (adj.). Electric heat customers have more thermostats (3.4 thermostats) than those who use oil (1.7 thermostats) or natural gas (1.6 thermostats) as a primary fuel (adj.).

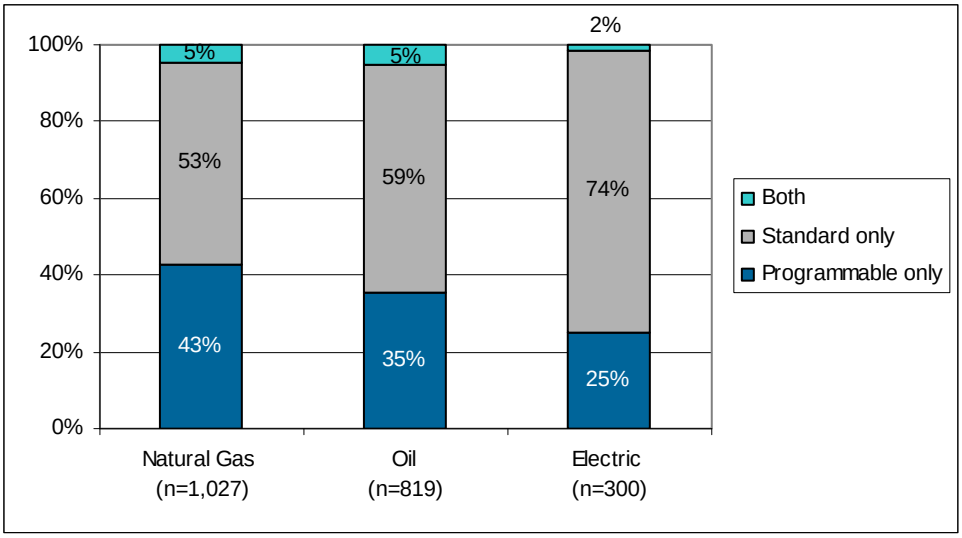
Over half of Massachusetts residential customers are using only standard thermostats (adj.). Low income customers have fewer thermostats and are more likely to use only standard thermostats than other Massachusetts customers.

Figure 16. Thermostat Type (Adj.)



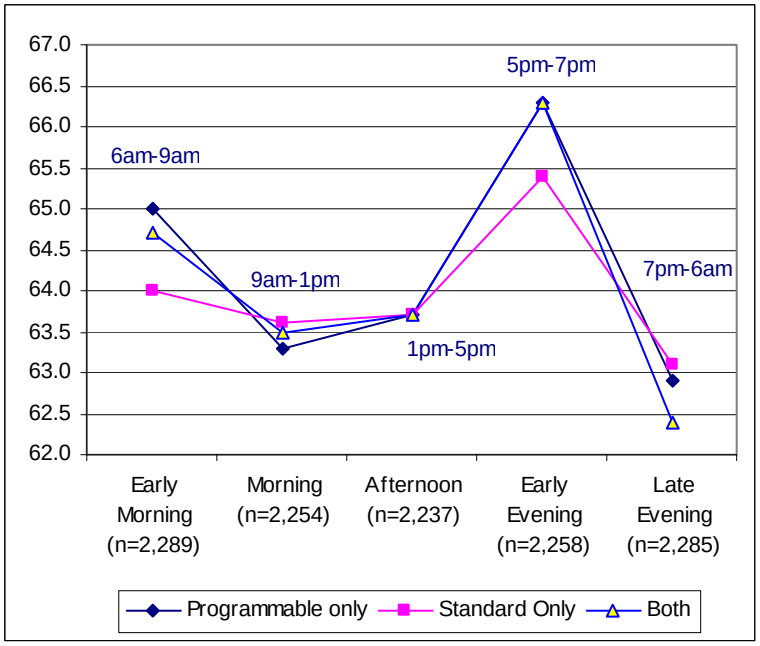
Cape Light Compact customers, customers who use electric heat as their primary fuel type, and customers with heating systems over 20 years old are more likely to use only standard thermostats. Conversely, customers with natural gas systems, customers whose heating systems is less than two years old and those with homes built after 1999 are more likely to use only programmable thermostats in their residence.

Figure 17. Thermostat Type by Primary Fuel Type (Adj.)



The mean thermostat setting for heating systems ranges from a low of 63.0 degrees (late evening, 7 p.m. to 6 a.m.) to a high of 65.8 degrees (early evening, 5 p.m. to 7 p.m.). Not surprisingly, temperature settings are slightly higher in the early morning (6 a.m. to 9 a.m.) and the early evening (5 p.m. to 7 p.m.), when people are in their homes before and after work/school. In general, CLC customers tend to set their thermostats at a lower setting than other electric service providers. Customers with newer homes (built in 2000 or later) tend to set their thermostats at a higher setting than those in homes built before 2000, and customers heating their homes with natural gas tend to set their thermostats at higher setting than customers heating with oil.

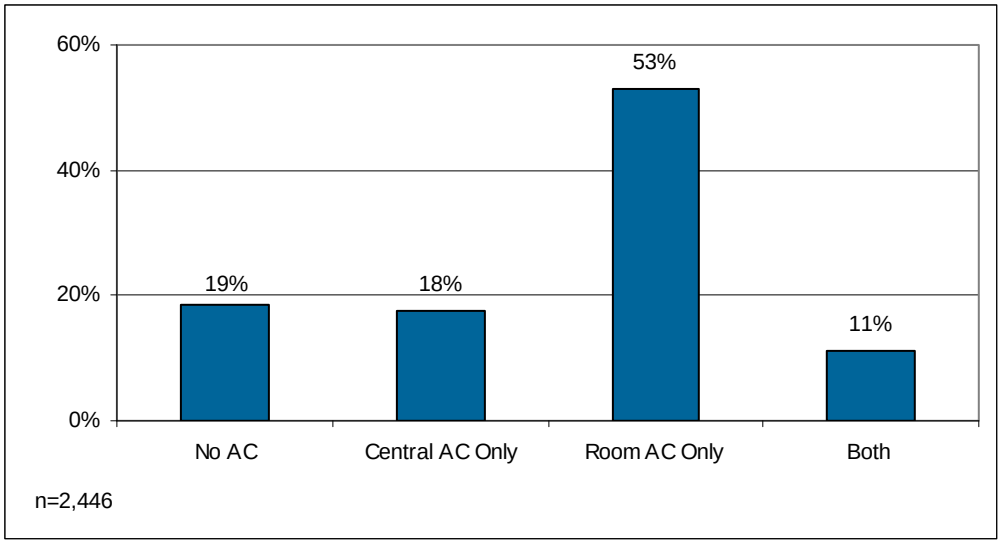
Figure 18. Mean Temperature Setting by Thermostat Type



3. SPACE COOLING

Overall, 81 percent of customers have some type of space cooling (adj.). Of those customers, 18% have only central air conditioning, 53% have only room air conditioning, and 11% have both central and room air conditioning (adj.).

Figure 19. Incidence of Space Cooling (Adj*.)

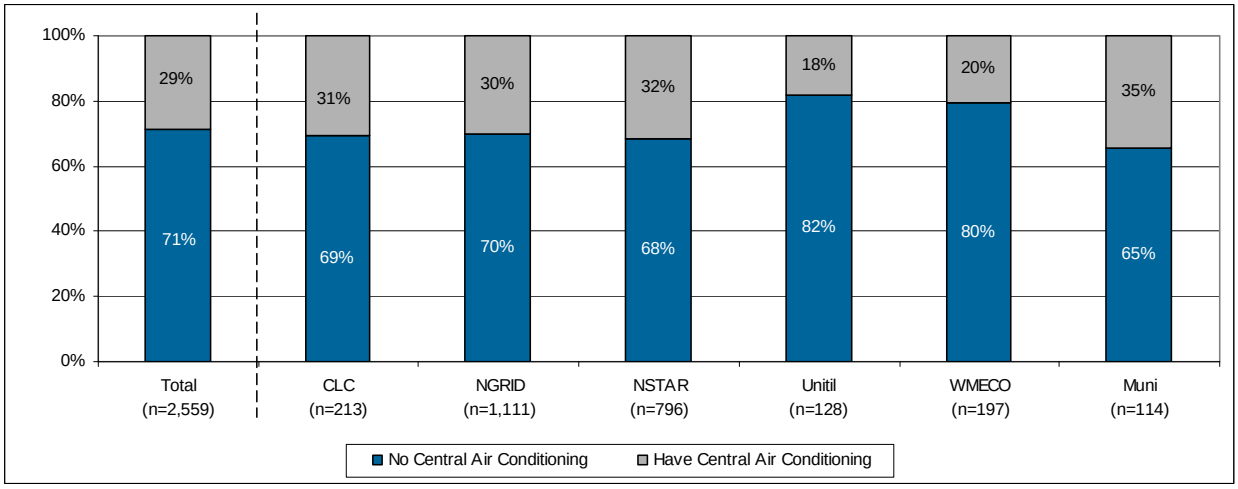


*Incidence of room air cooling could not be verified; adjustments were only made to central air cooling.

Central Air Cooling

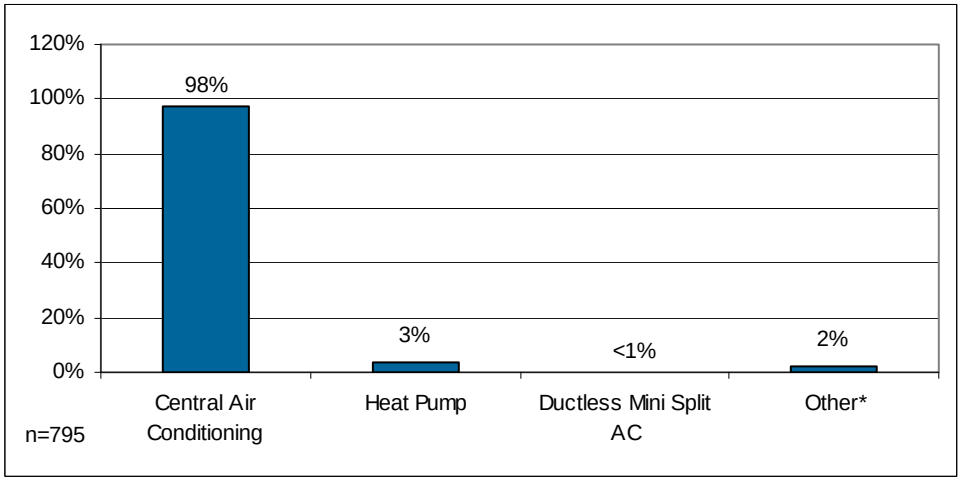
Twenty-nine percent of customers have central air cooling (adj.). Customers who live in an apartment building with five or more units, customers in homes built after 1999, and non-low income customers are more likely to have a central air cooling system. Customers of Unitil and WMECO are less likely to have a central air cooling system than customers of other Massachusetts service providers.

Figure 20. Incidence of Central Air Cooling by Provider



Almost all customers who have central air systems have central air conditioning (98%). Only 3% have a heat pump that heats and cools, and less than 1% have a ductless mini-split system (adj.).

Figure 21. Cooling System Type (Adj.)



*Incidence of "other" types of central air cooling could not be verified; no adjustment was made.

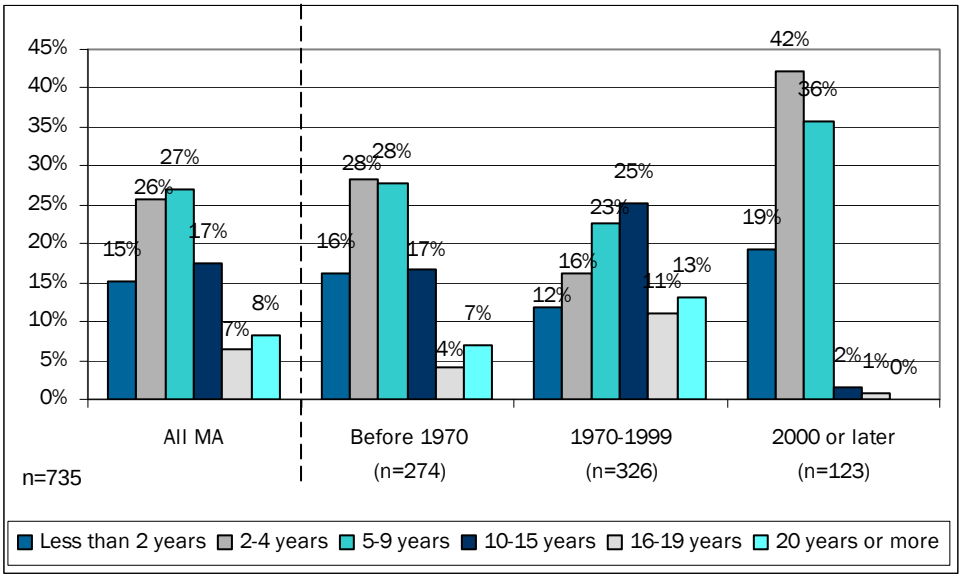
Customers with central air conditioning generally have 1.2 units per household (adj.). Over 80% of central air cooling systems cool 75-100% of the residence (adj.).

The mean age of customer's main cooling system is 7.7 years. Fifteen percent of customers report that their cooling system is less than two years old, while 8% of customers have a system that is more than 20 years old.

Homes built between 1970 and 1999 have the oldest central air conditioning systems (9.7 years), compared to those built before 1970 (7.0 years) and those built after 1999 (4.3

years), reflecting more recent additions or replacements of central cooling systems in the oldest homes.

Figure 22. Age of Central AC System by Age of Home

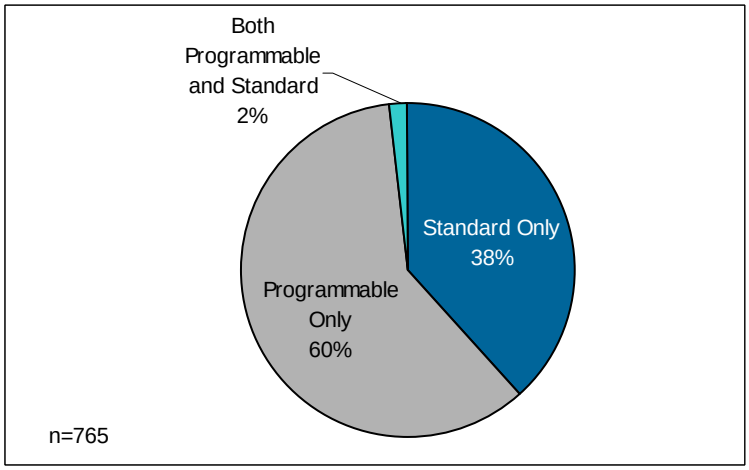


Thermostats

Ninety-two percent of customers have at least one thermostat for their cooling system, with an average of 1.5 thermostats per home (adj.). Customers in single family homes have more thermostats (1.6 thermostats) than those in apartments with 2-4 units (1.1 thermostats) or five or more units (1.2 thermostats) (adj.).

Over half of Massachusetts residential customers are using programmable thermostats only. Non-low income customers are more likely than other Massachusetts customers to use programmable thermostats only.

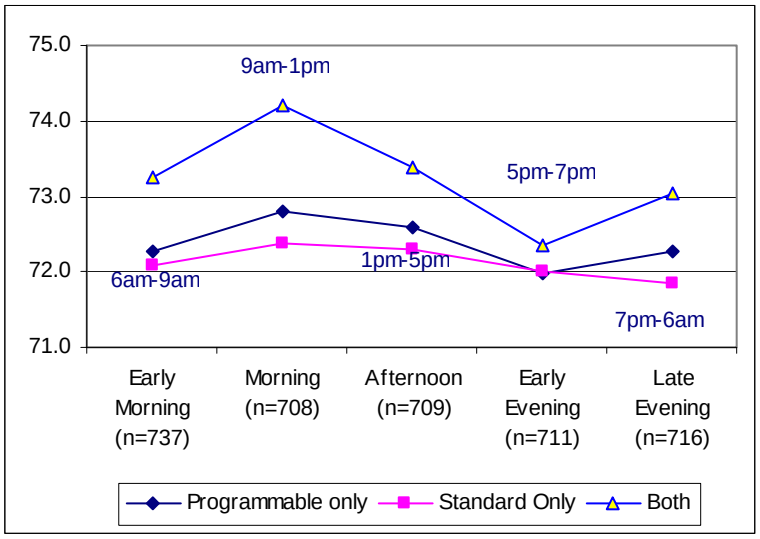
Figure 23. Type of Thermostat (Adj.)



Cape Light Compact customers, customers with electric heat as their primary fuel, and those that live in an apartment building with five or more units are more likely to use only standard thermostats. Conversely, customers with natural gas systems and customers whose central air cooling unit is less than two years old are more likely to use only programmable thermostats in their residence.

The mean thermostat settings for air cooling systems are fairly consistent throughout the day, with the average temperatures ranging from a low of 72.0 in the early evening (5 p.m. to 7 p.m.) to a high of 72.6 in the morning (9 a.m. to 1 p.m.).

Figure 24. Mean Temperature Setting by Thermostat Type



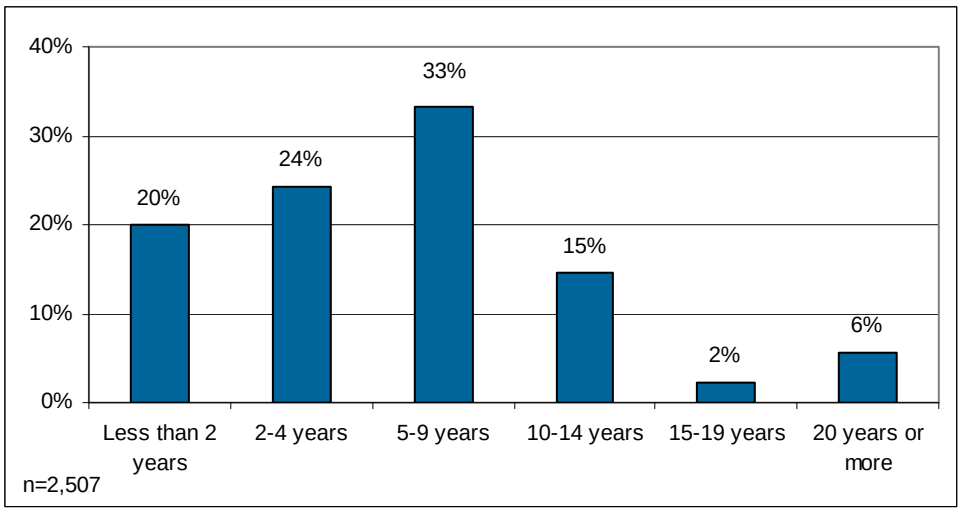
Room Air Conditioners

Sixty-four percent of customers have room air conditioners. National Grid customers, customers who live in homes built before 2000, and low income customers are more likely to have room air conditioners.

Customers who have room air conditioners have an average of two units.

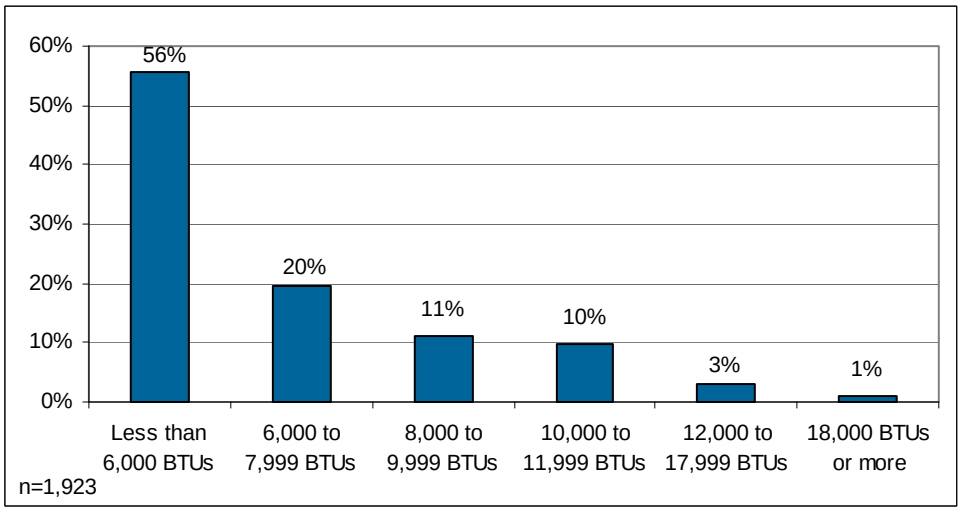
The average age of customers' room air conditioners is 6.5 years (adj.). Customers that live in an apartment building with five or more units are more likely to have an older room air conditioner (8.7 years) compared to those living in a single-family home (6.6 years) or those living in a building with two to four units (5.9 units) (adj.).

Figure 25. Age of Room Air Conditioners (Adj.)



Over half of all room air conditioners are less than 6,000 BTUs in size; the average size is approximately 7,200 BTUs (adj.). In general, customers in homes that have electric heat as their primary heating fuel, and customers of NGRID, NSTAR, and WMECO tend to have a larger room air conditioner compared to those with natural gas heat and customers of CLC and Unitil.

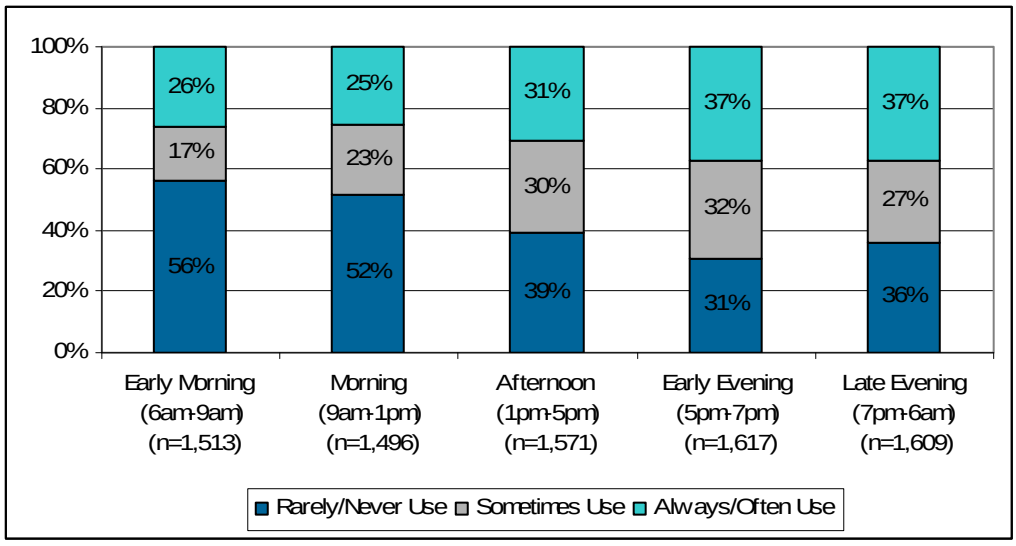
Figure 26. Size of Room Air Conditioners (Adj.)



Frequency of Use

Customers tend to use their air conditioning systems more frequently from the early evening through the night with around one-third of customers saying they use their cooling system often or always (at least five days a week) during the cooling season. Over 50% of customers report not using or rarely (two days a week or less) using the cooling system during the morning hours.

Figure 27. Frequency of Air Conditioning Use by Time Period

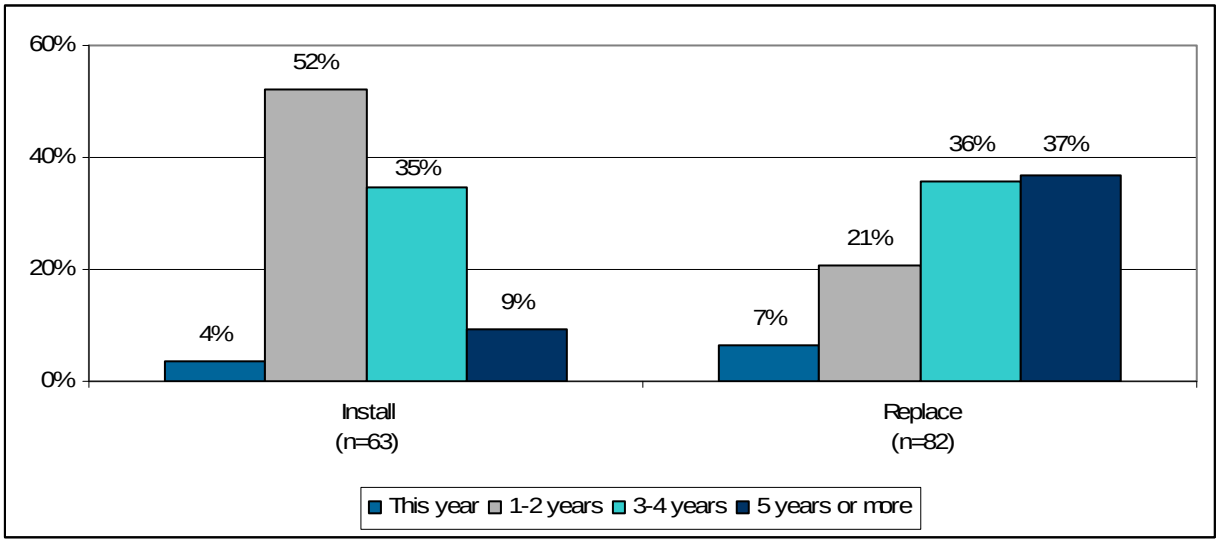


Plans for Future Air Conditioning Installation/Replacement

Fourteen percent of customers who do not currently have a central air conditioning system are very or somewhat likely to install a central air system in the future. Over 50% of these customers are planning on installing the central air conditioning system in the next one to two years.

Twenty-nine percent of customers that currently have a central air conditioning system are very or somewhat likely to replace that system. However, over 70% of those customers are planning to wait three or more years before making the replacement.

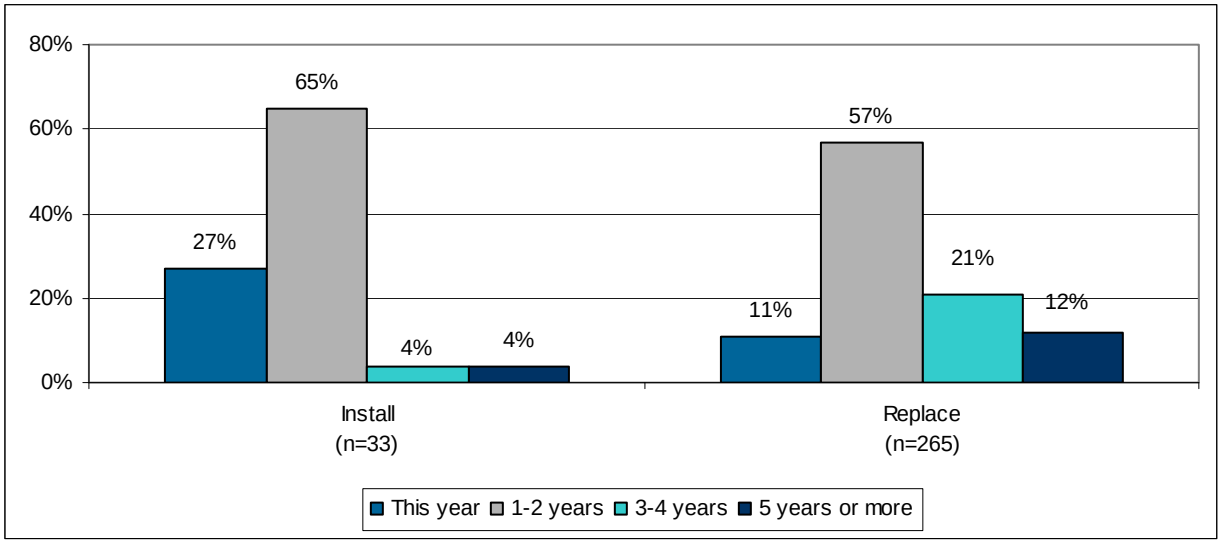
Figure 28. Timeline for Installation/Replacement of Central AC



Fifteen percent of customers who do not currently have a room air conditioning unit are very or somewhat likely to install one in the future. Over 90% of these customers are planning on installing the unit in the next one to two years.

Forty-one percent of customers that currently have a room air conditioning unit are very or somewhat likely to replace that unit. Nearly 70% of those customers are planning to make the replacement within the next one to two years.

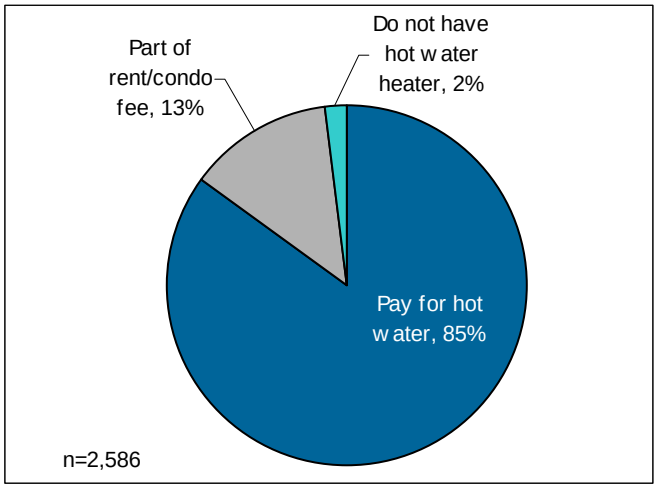
Figure 29. Timeline for Installation/Replacement of Room AC



4. WATER HEATING

Eighty-five percent of Massachusetts residential customers pay for hot water in their home. Thirteen percent of customers have hot water included in their rent or condo fee, and 2% report not having a water heating system. Customers without a water heating system are more likely to use oil for their primary heating fuel.

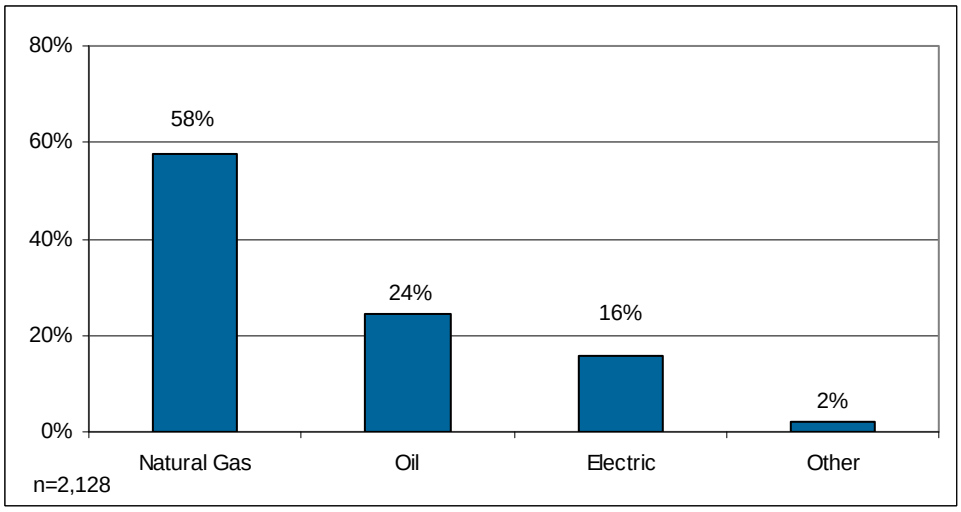
Figure 30. Penetration of Water Heating Systems



Water Heating System Type

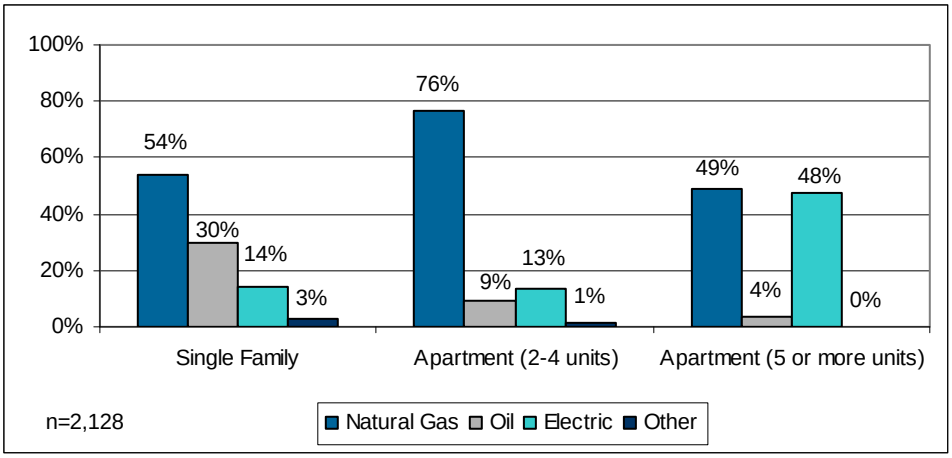
Natural gas is the most common fuel for water heating systems (58%), followed by oil (24%), and electric (16%) (adj.). Not surprisingly, this order is the same as the fuel types for space heating. However, compared to space heating systems, water heating systems are less likely to be fueled by oil and more likely to be be electric.

Figure 31. Primary Water Heating Fuel (Adj.)



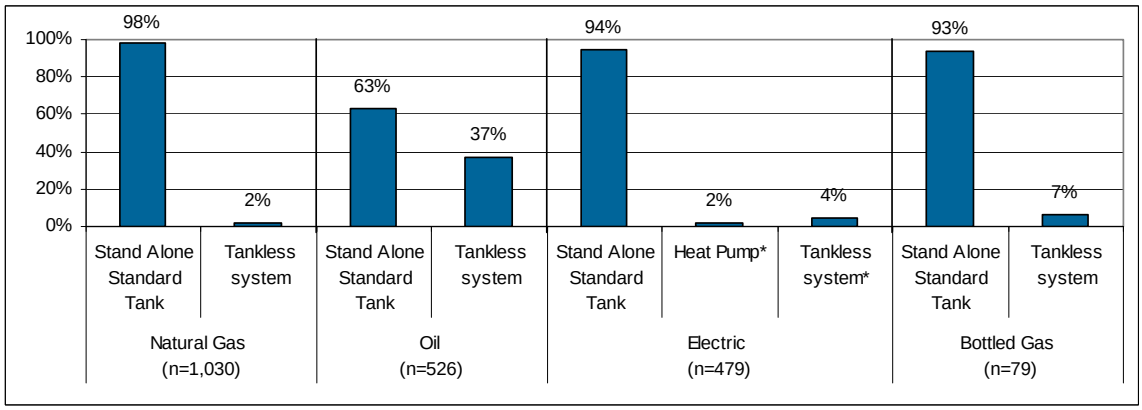
Compared to other Massachusetts customers, customers who live in a residence with two to four units are more likely to use natural gas to heat their water. Customers living in single family homes and customers living in homes built before 2000 are more likely to heat their water using oil.

Figure 32. Primary Water Heating Fuel by Building Type (Adj.)



Most water heating systems have stand alone tanks. Tankless systems are more common in oil and bottled gas systems than other types of systems.

Figure 33. Primary Water Heating System by Fuel Type (Adj.)

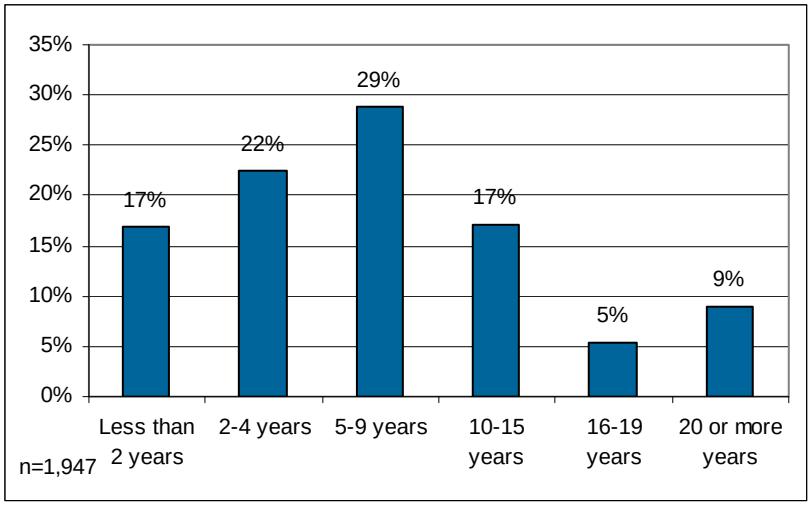


*Incidence of "other" types of central air cooling could not be verified; no adjustment was made.

The average age of the primary water heater for Massachusetts residential customers is 7.8 years. Almost one-third of water heating systems is 10 years or older, and 9% are 20 years or older.

Oil-fired water heating systems tend to be older (average 10.2 years) than natural gas (6.5 years) or electric (8.0 years) systems, reflecting the fact that older homes are more likely to be fueled by oil than newer homes.

Figure 34. Age of Primary Water Heater

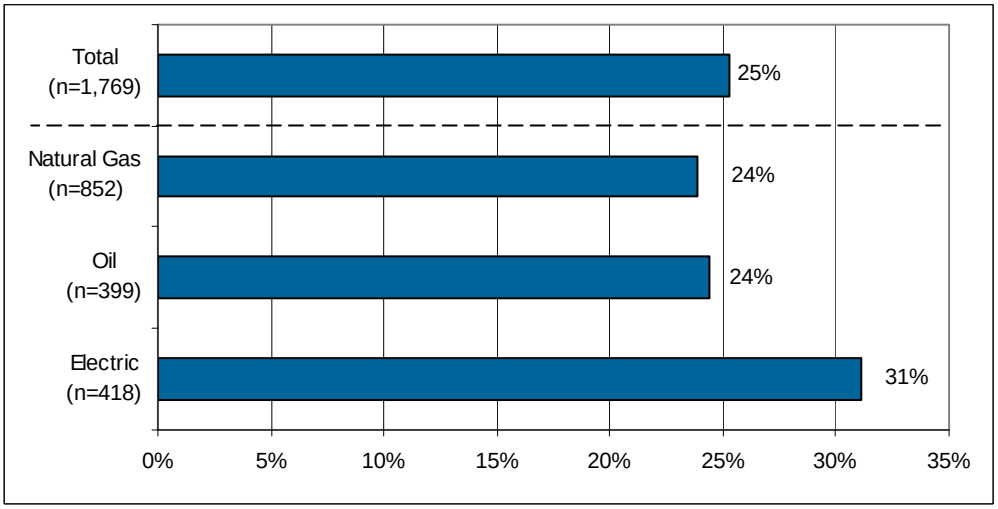


Only 1% of respondents report having an additional water heating system (adj.).

Incidence of Energy Efficiency Measures

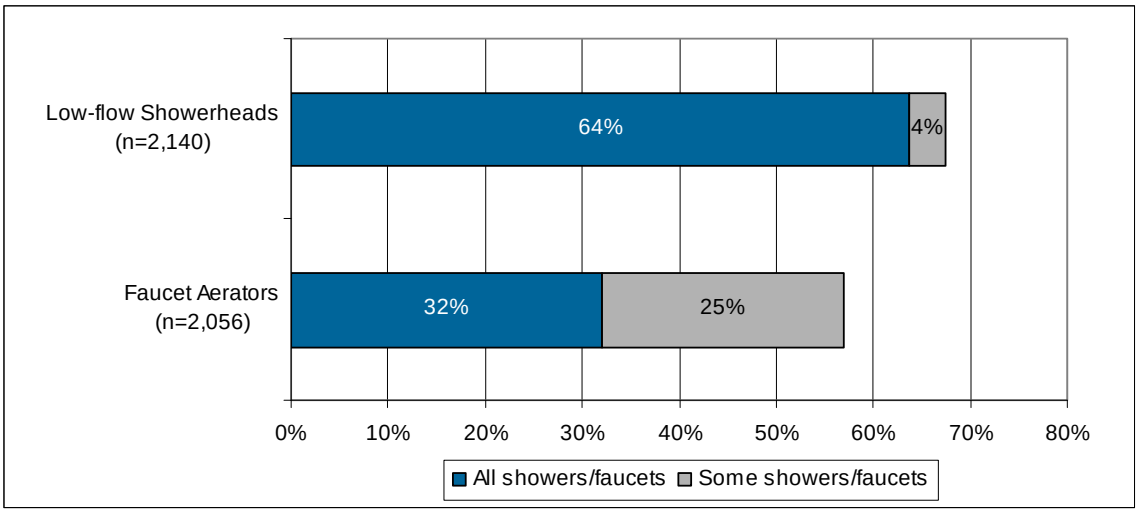
One-quarter of Massachusetts residential customers have an insulation blanket or tank wrap for their primary hot water heater. Those with electric water heaters are more likely to have an insulation blanket or tank wrap than those using oil or natural gas systems.

Figure 35. Penetration of Insulation Blanket by Water Heating Fuel Type



Two-thirds of residents have low-flow showerheads installed in some or all of the showers in their home and 57% of residents have water saving aerators on some or all faucets in their home (adj.). More homeowners than renters have these water saving measures installed.

Figure 36. Penetration of Water Saving Features (Adj.)

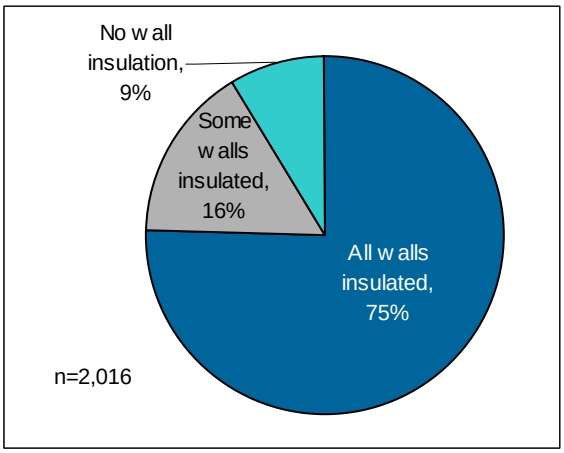


5. BUILDING SHELL

Insulation

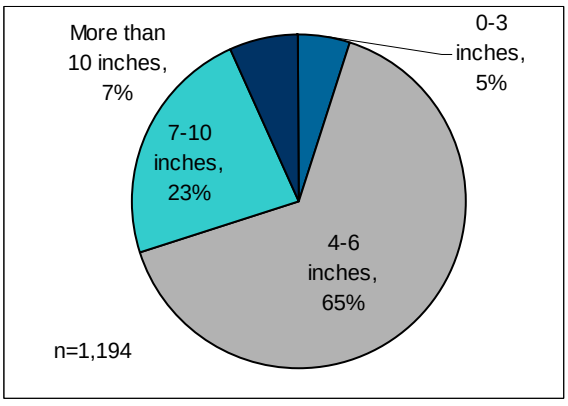
Seventy-five percent of Massachusetts residential customers have insulation in all of their home's exterior walls. An additional 16% have some of their exterior walls insulated, while 4% have no exterior wall insulation. Single-family homes (79%), non-low income customers (77%), and customers with electric heat (84%) are more likely to have insulation on all exterior walls than other Massachusetts customers. Conversely, low income customers (22%) and NSTAR customers (14%) are more likely to have no exterior wall insulation.

Figure 37. Insulation of Exterior Walls



The vast majority of customers (89%) report that their home's attic or ceiling is insulated. Of those with insulated attics or ceilings, most customers (65%) have four to six inches of insulation (adj.). Twenty-three percent of customers have seven to ten inches of insulation (adj.). Only 7% have more than 10 inches, and 5% have zero to three inches (adj.).

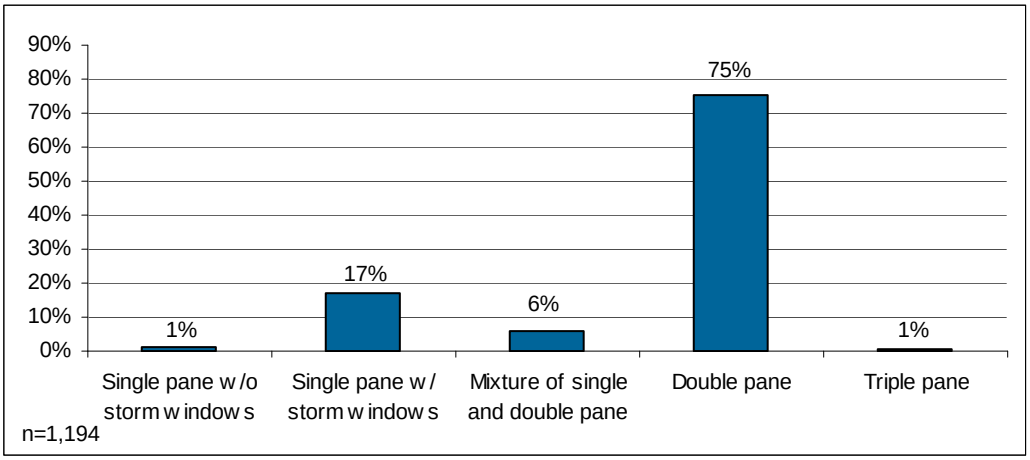
Figure 38. Amount of Attic/Ceiling Insulation (Adj.)



Windows

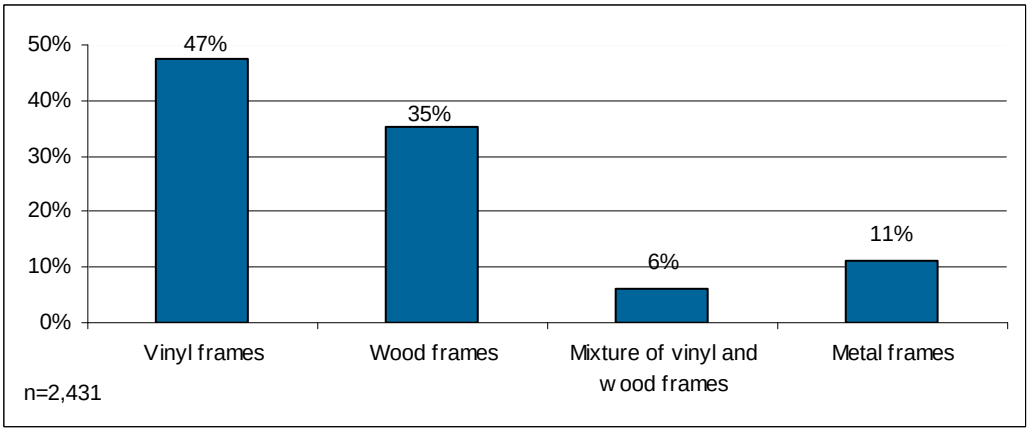
Seventy-five percent of customers have double panes in most or all of their windows (adj.). Another 17% have all or mostly single pane windows with storm windows (adj.). Only 1% have single pane windows without storm windows or triple paned windows (adj.). Low income customers are more likely to have single pane windows.

Figure 39. Types of Windows (Adj.)



Vinyl and wood are the most popular window frame materials among Massachusetts residential customers. Forty-seven percent of customers have vinyl frames only while 35% have wood frames only (adj.). An additional 6% have a mixture of vinyl and wood frames (adj.). Only 11% of respondents have metal frames (adj.). Customers in residences of five or more units (44%) and customers with electric heat (27%) are more likely to have windows with metal frames than other Massachusetts customers (adj.).

Figure 40. Types of Window Frame Materials (Adj.)

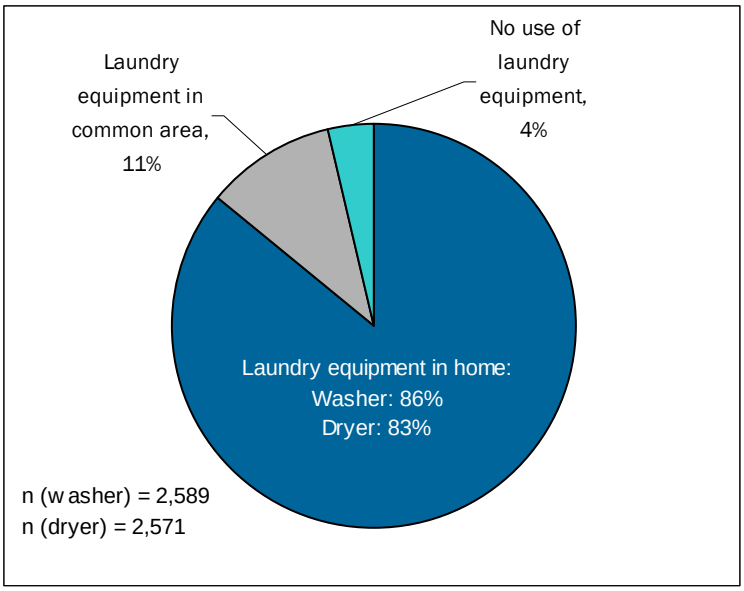


6. LAUNDRY EQUIPMENT

Penetration of Laundry Equipment

Eighty-six percent of Massachusetts residential customers have laundry equipment in their own home (adj.). An additional 11% have use of laundry equipment in a common area of their building, while 4% have no access to laundry equipment in their building (adj.). Eighty-six percent of customers have washers in their homes; 83% have dryers (adj.).

Figure 41. Penetration of Clothes Washers and Dryers (Adj.)



The majority of customers who use laundry equipment in a common area of their building live in multi-family residences of five or more units (71%), while the majority of customers who do not have access to laundry equipment live in multi-family residences of two to four units (53%).

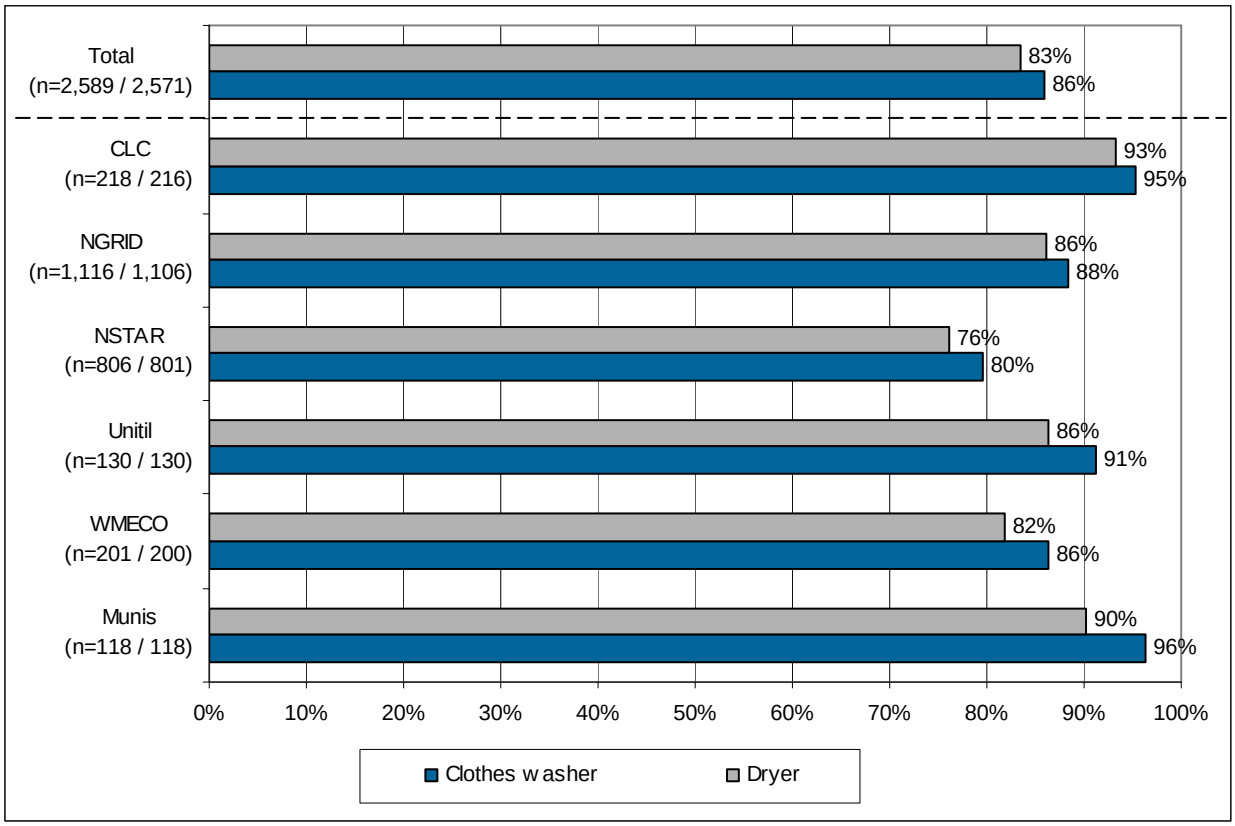
Customers who live in single-family homes are more likely to have private use of laundry equipment in their home compared to customers living in multi-family and other types of homes (including mobile homes). Customers who live in multi-family homes of five or more units and low income customers are more likely than other Massachusetts customers to have use of laundry in a common area.

- **Single-family (n=1,680):** Private use – 98%; Use in common area – 1%
- **Multi-family (2-4 units) (n=527):** Private use – 79%; Use in common area – 12%
- **Multi-family (5+ units) (n=347):** Private use – 37%; Use in common area – 57%
- **Other (n=24):** Private use – 71%; Use in common area – 11%

Customers served by municipal utilities have the highest penetration of clothes washers (96%); Cape Light Compact customers have the highest penetration of clothes dryers (93%)

(adj.). Compared to Massachusetts customers served by other electricity providers, NSTAR customers are less likely to have private use of laundry equipment, reflecting the fact that fewer NSTAR customers live in single-family homes.

Figure 42. Penetration of Clothes Washers and Dryers by Service Provider (Adj.)

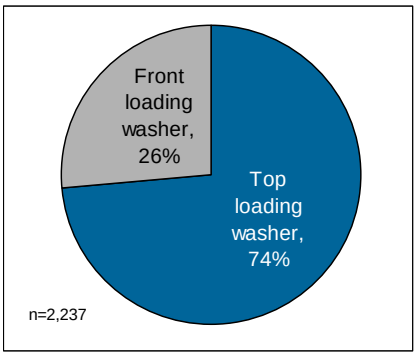


The remainder of this section is based on customers who have *private use of laundry equipment in their own home*, i.e., the laundry equipment they use is not located in a common area of a multi-family residence.

Clothes Washers

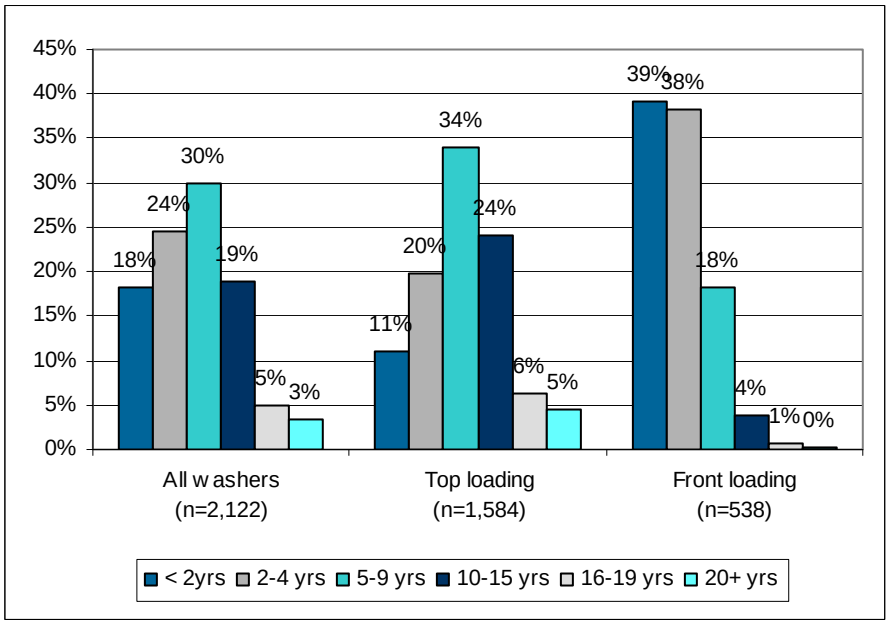
Approximately three-quarters of customers (74%) own top loading washers; one-quarter own front loading washers (adj.). Low income customers are more likely to have top loading washers.

Figure 43. Type of Clothes Washer (Adj.)



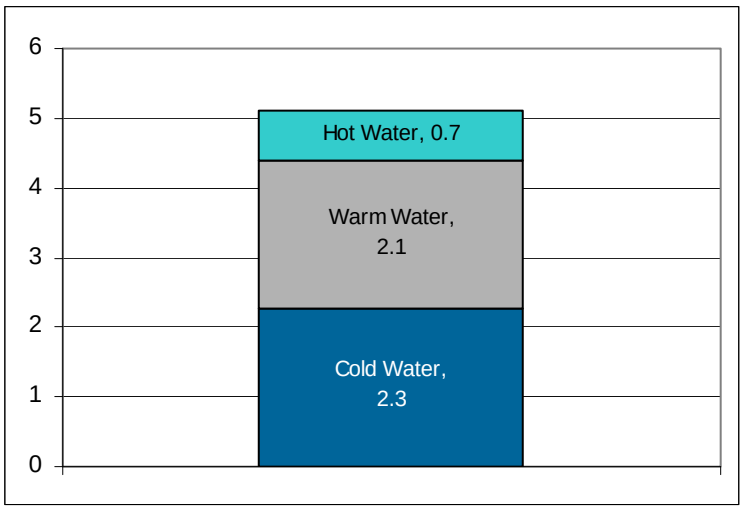
The mean age of all clothes washers is 6.9 years. Front loading washers are newer (mean age of 3.4 years) than top loading washers (mean age of 8.1 years). In fact, 54% of all washers purchased in the past two years are front loaders, compared to only 40% purchased between two and four years ago, and 10% purchased more than four years ago.

Figure 44. Age of Clothes Washers



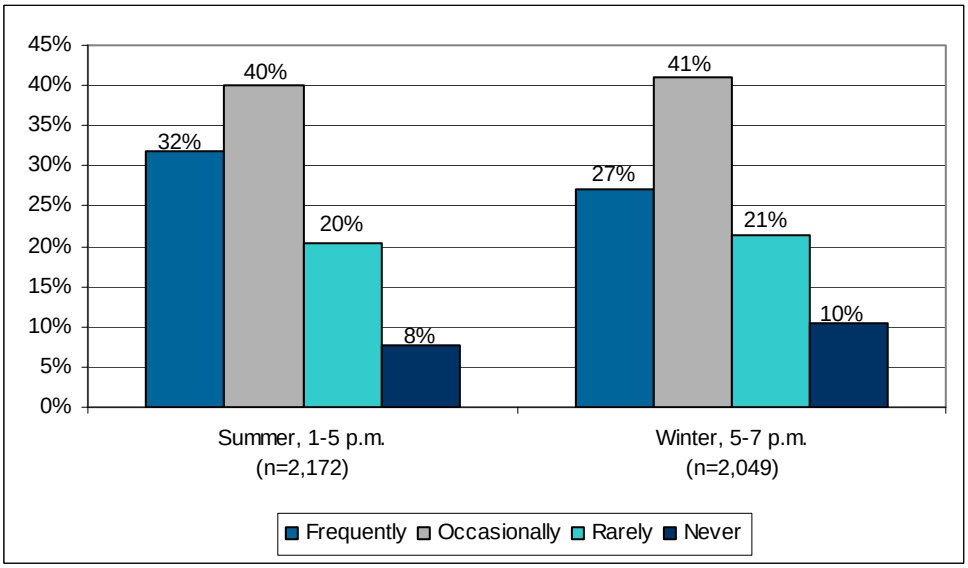
On average, Massachusetts residential customers wash 5 loads of laundry per week, 1 in hot water, 2 in warm water, and 2 in cold water. Customers in single-family homes wash more loads per week (5.3) than customers in multi-family homes of two to four units (4.7 loads), customers in multi-family homes of five or more units (4.3 loads), and customers in other types of buildings (3.6 loads).

Figure 45. Number of Loads in a Typical Week



Thirty-two percent of customers use their laundry equipment "frequently" (defined as three to five days per week) during summer peak demand hours (1 p.m. to 5 p.m.); 28% "rarely" (defined as less than one day per week) or never use it during those times. Similarly, 27% of customers use their laundry equipment frequently during winter peak demand hours (5 p.m. to 7 p.m.), while 31% rarely or never use it during those times.

Figure 46. Weekday Use of Laundry Equipment

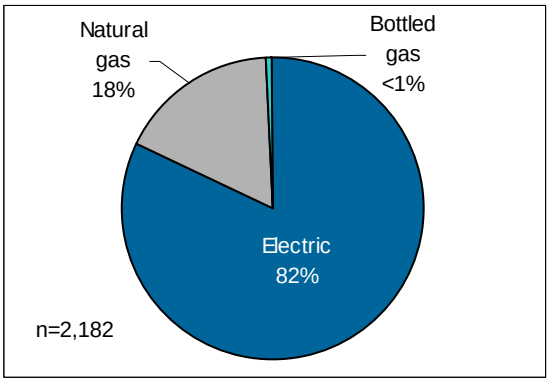


Clothes Dryers

Eighty-three percent of Massachusetts residential customers have clothes dryers for their private use (adj.). Of those customers, 82% own an electric dryer and 18% own a natural gas dryer. Less than 1% own a dryer powered by bottled gas (adj.). Customers in single-family homes and in multi-family homes of two to four units are more likely to own a natural gas

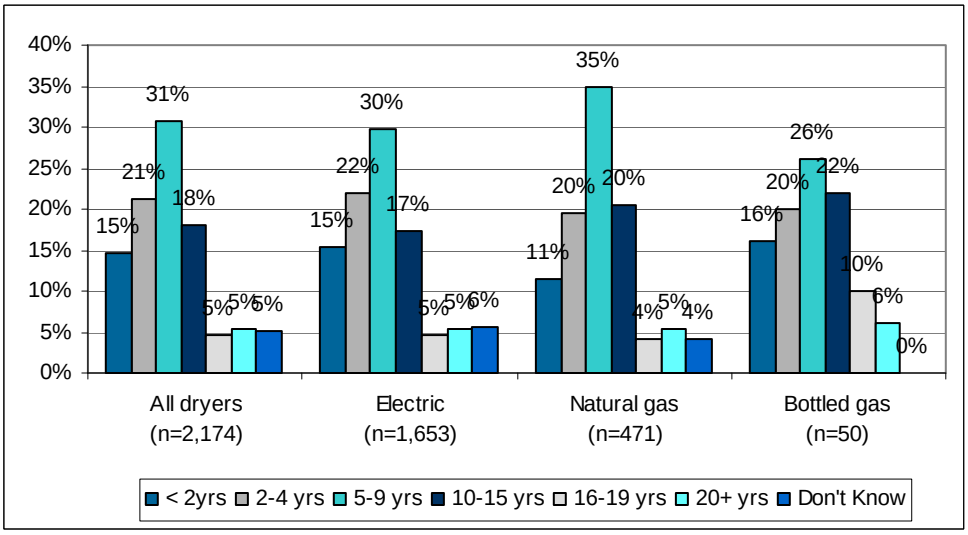
dryer than customers in multi-family homes of five or more units and customers living in other types of residences.

Figure 47. Type of Clothes Dryer (Adj.)



The mean age of all clothes dryers is 7.5 years. The age distribution is similar for different types of clothes dryers and for dryers owned by different groups of customers (there are no systematic differences by electric service provider, building type, or primary heating fuel).

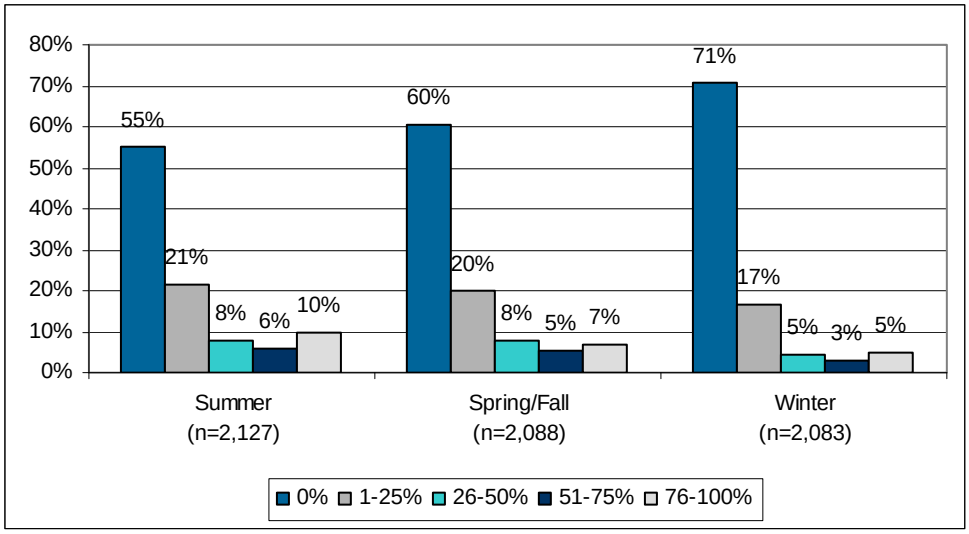
Figure 48. Age of Clothes Dryers



Few customers who have a clothes dryer for their private use line dry their clothes. On average, 18% of loads are line dried in the summer, compared to 14% in the spring and fall and 10% in the winter. Compared to other Massachusetts customers, WMECO customers, low income customers, and customers with natural gas dryers more frequently line dry their clothes in summer and in the spring and fall.

More than half of Massachusetts residential customers never line dry their clothes in the summer; this share increases to almost three-quarters in the winter.

Figure 49. Percentage of Loads Line-Dried



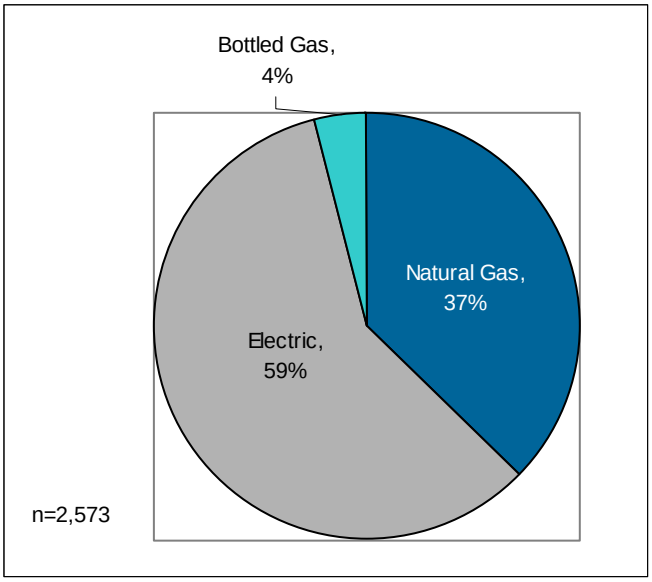
7. FOOD PREPARATION

Cooking Appliances

Most Massachusetts customers have electric cooking appliances: 59% of stovetops/ranges are electric while just over one-third use natural gas (adj.).

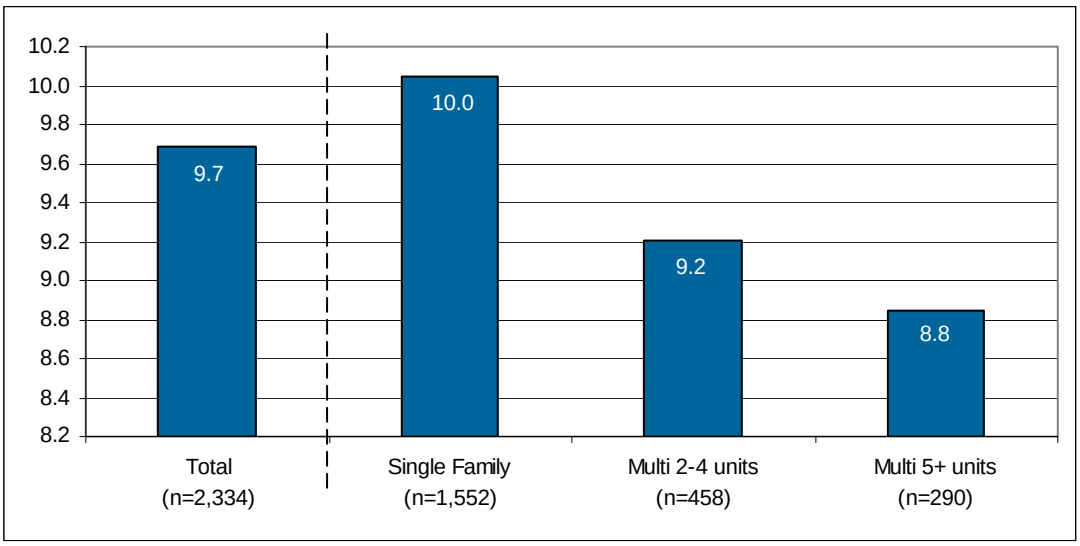
NSTAR customers (52%) and customers living in multi-family buildings with two to four units (55%) are more likely to have natural gas stovetops/ranges than other Massachusetts customers (adj.). WMECO customers have the highest percentage of electric food preparation equipment (76%) (adj.).

Figure 50. Fuel Type (Adj.)



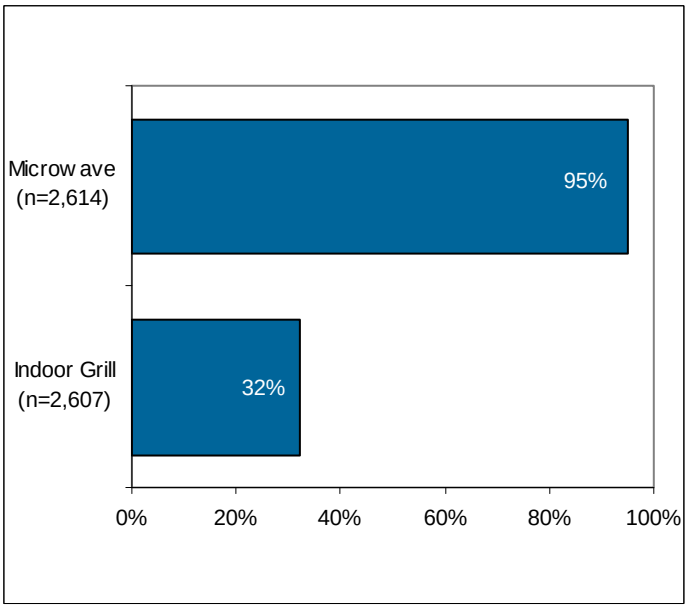
Stovetops/ranges in Massachusetts households are on average 9.7 years old (adj.). Overall, single family homes are more likely to have older food preparation equipment than multi-family homes.

Figure 51. Average Age of Stovetops/Ranges (Adj.)



The penetration of microwave ovens is extremely high at 95% among all Massachusetts customers (adj.). Single family homes have the highest penetration of microwave ovens at 97% (adj.). "George Foreman"-type indoor grills are owned by approximately one-third of Massachusetts residential customers.

Figure 52. Microwave (Adj.) and Indoor Grill Penetration

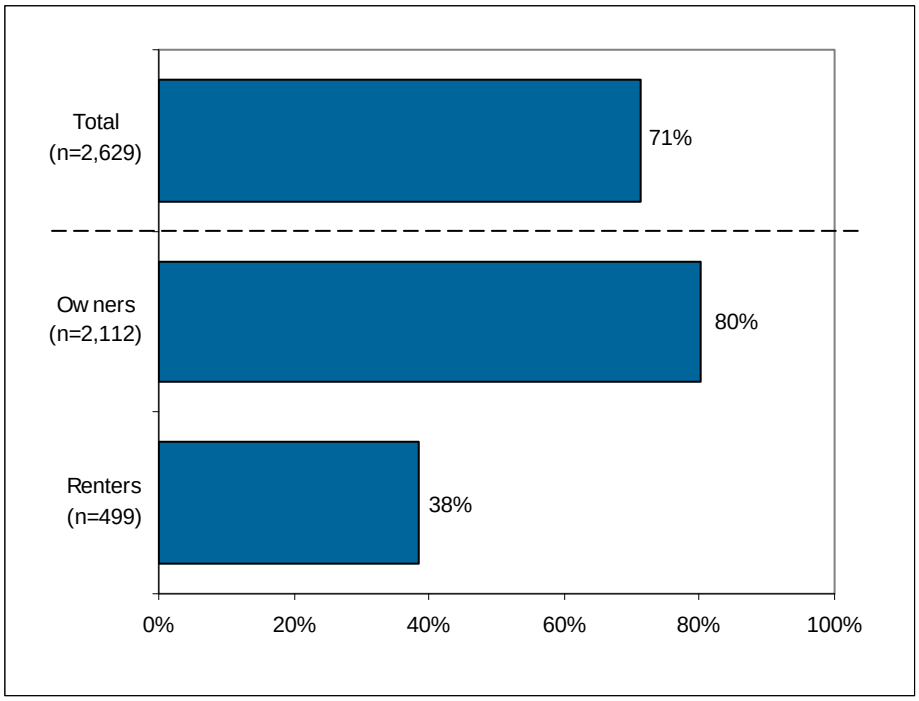


Dishwashers

Seventy-one percent of Massachusetts residential customers have a dishwasher in their home (adj.). Overwhelmingly, customers who own their residence are more likely to have a dishwasher (80%) than renters (38%) (adj.). In addition, customers who live in single family

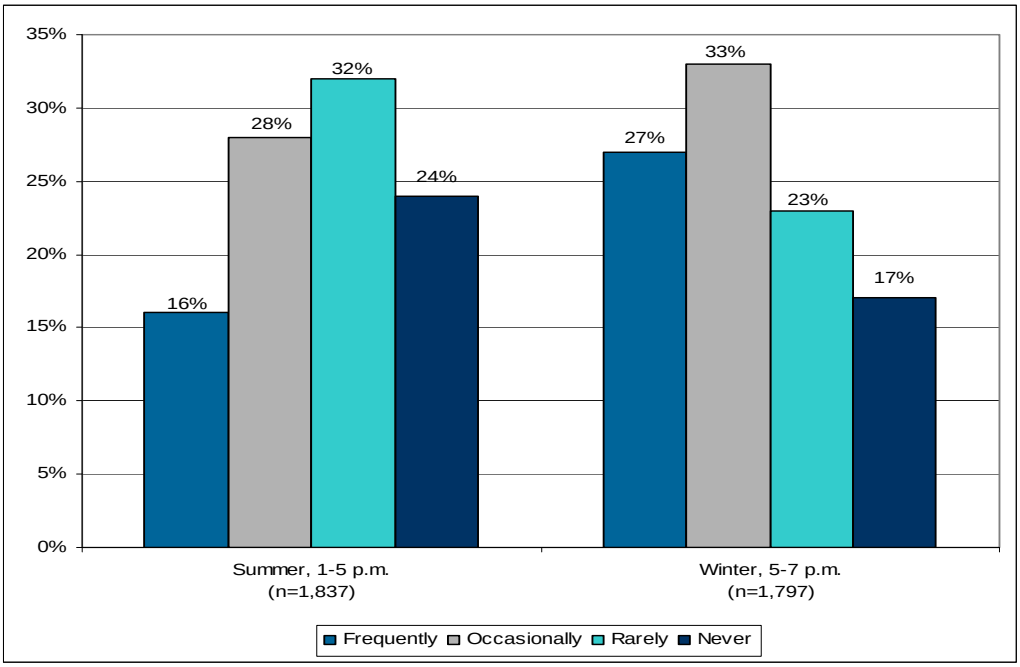
homes or newer residences and non-low income customers are also more likely to own a dishwasher than their counterparts. Customers of Cape Light Compact and the municipal utilities are more likely to own a dishwasher than the customers of other providers. On average customer's dishwashers are 7.3 years old.

Figure 53. Dishwasher Penetration by Owners/Renters (Adj.)



In a typical week, residents run their dishwasher an average of 3.2 times. Customers are more likely to use their dishwasher during winter peak demand times (between 5 p.m. and 7 p.m.) than during summer peak demand times (between 1 p.m. and 5 p.m.). The exception are Cape Light Compact customers who use their dishwashers more frequently during the summer months, reflecting the fact that many Cape homes are seasonal residences and primarily used in the summer.

Figure 54. Weekly Use of Dishwasher



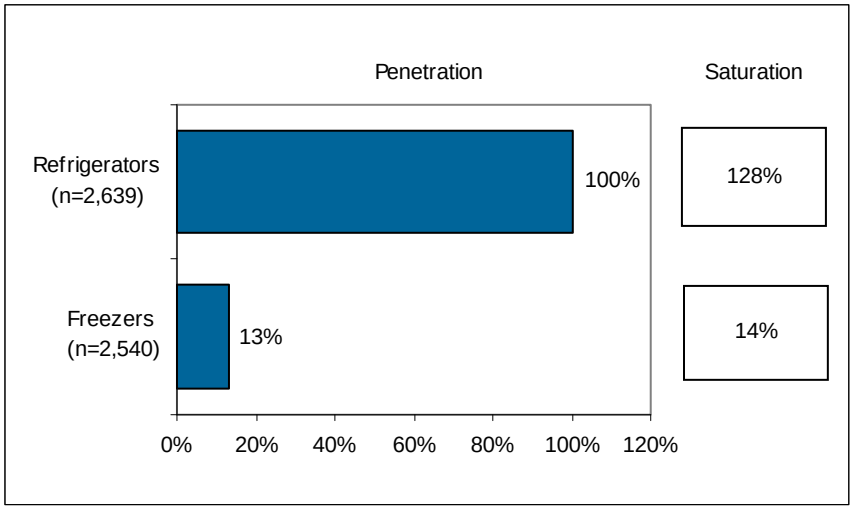
8. REFRIGERATORS AND FREEZERS

Penetration and Saturation

Virtually all Massachusetts households (99.6%) have a refrigerator. Twenty-seven percent of customers have two or more refrigerators, for an average of 1.3 refrigerators per household (adj.). Stand-alone freezers are less common. Thirteen percent of households have a stand-alone freezer, and only 1% own more than one (adj.).

Not surprisingly, customers living in single family homes are more likely to have freezers and multiple fridges than customers in multi-family residences.

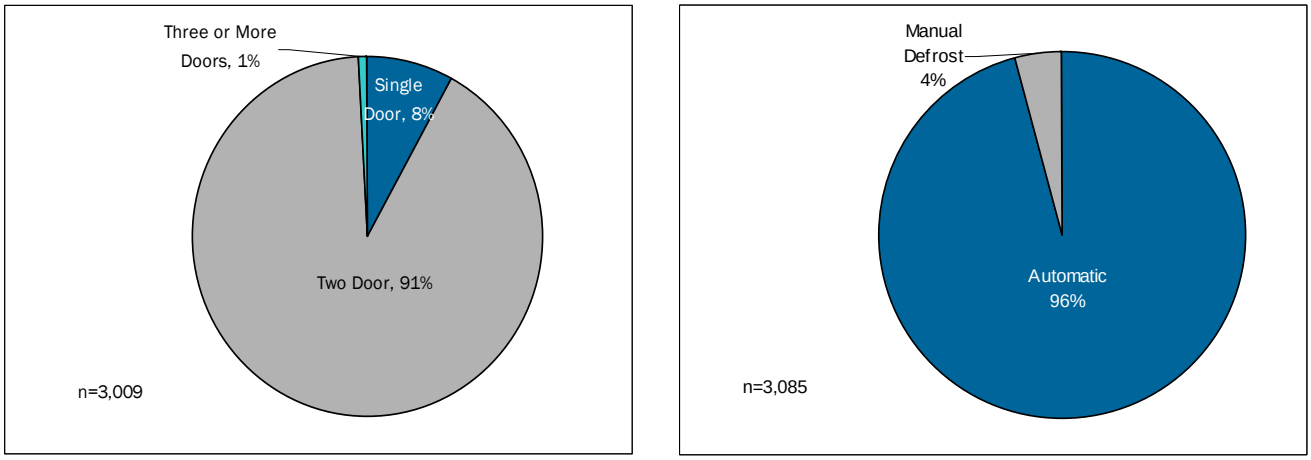
Figure 55: Refrigerator and Freezer Penetration and Saturation (Adj.)



Refrigerators

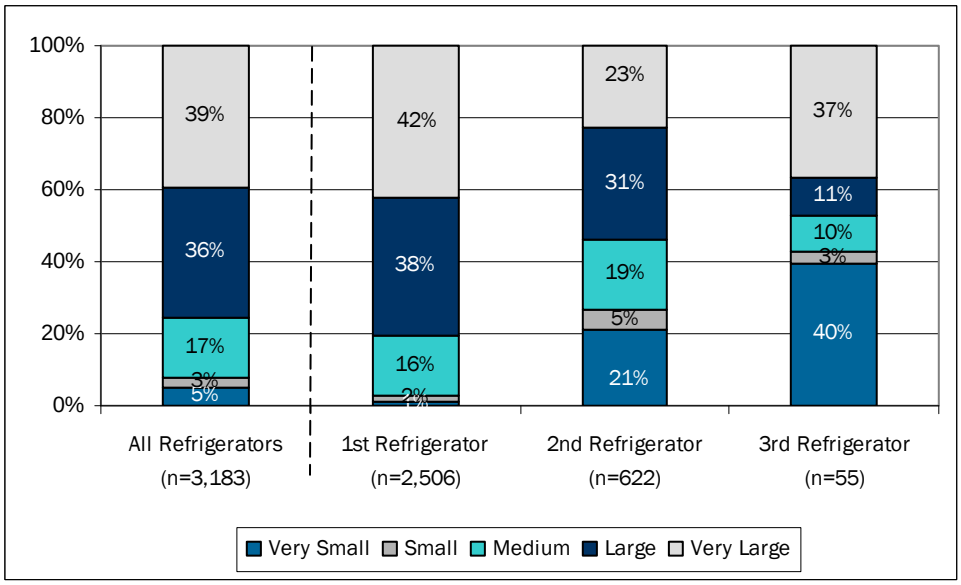
Ninety-one percent of refrigerators have two doors; of these 68% have a freezer on top, 10% have a bottom freezer, and 21% have two doors side-by-side (adj.). Customers living in multi-unit buildings are more likely to own a single-door refrigerator. Almost all refrigerators (96%) are automatic defrost/frost-free models (adj.). Low income customers are more likely to have a manual defrost refrigerator than other Massachusetts customers.

Figure 56: Types of Refrigerators (Adj.)



The majority of refrigerators are either large (19-22 cu. ft.; 36%) or very large (over 22 cu. ft.; 39%) in size (adj.). Primary refrigerators tend to be larger than second and third refrigerators. Not surprisingly, residents of single family homes and non-low income customers are more likely to have large and very large refrigerators. In addition, newer refrigerators tend to be larger than older refrigerators, indicating changes in the refrigerator market and customer preference over time.

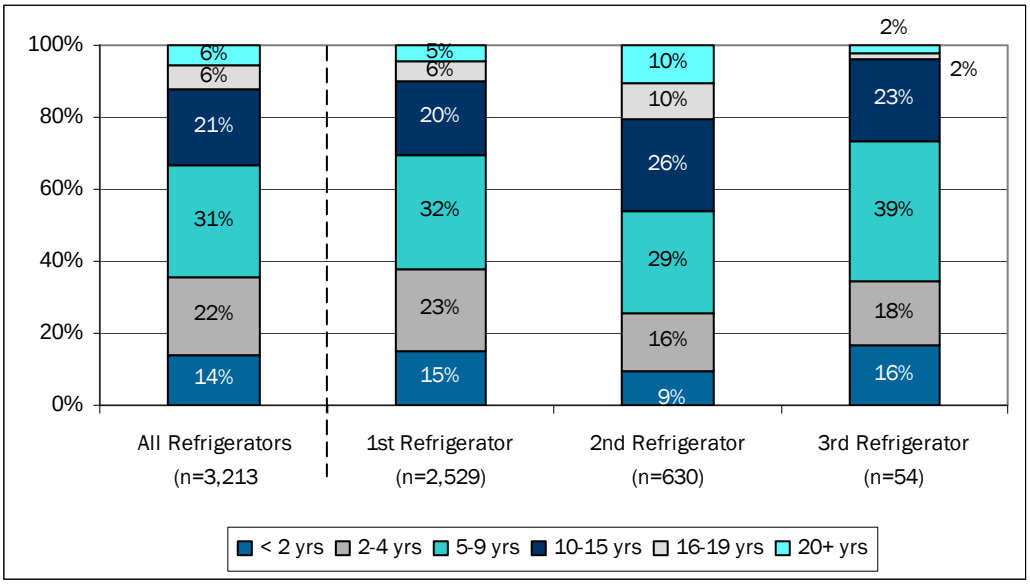
Figure 57: Refrigerator Size (Adj.)



Primary and additional refrigerators also differ in terms of age. Seventy percent of primary refrigerators are less than 10 years old, compared to 54% of second refrigerators. Interestingly, the smaller third refrigerators tend to be newer than the second refrigerators. It is possible that these are purchased to fulfill specific needs in the household, whereas

second refrigerators are more likely to be former primary refrigerators that have been relegated to secondary status when a newer model was purchased.

Figure 58: Age of All Refrigerators

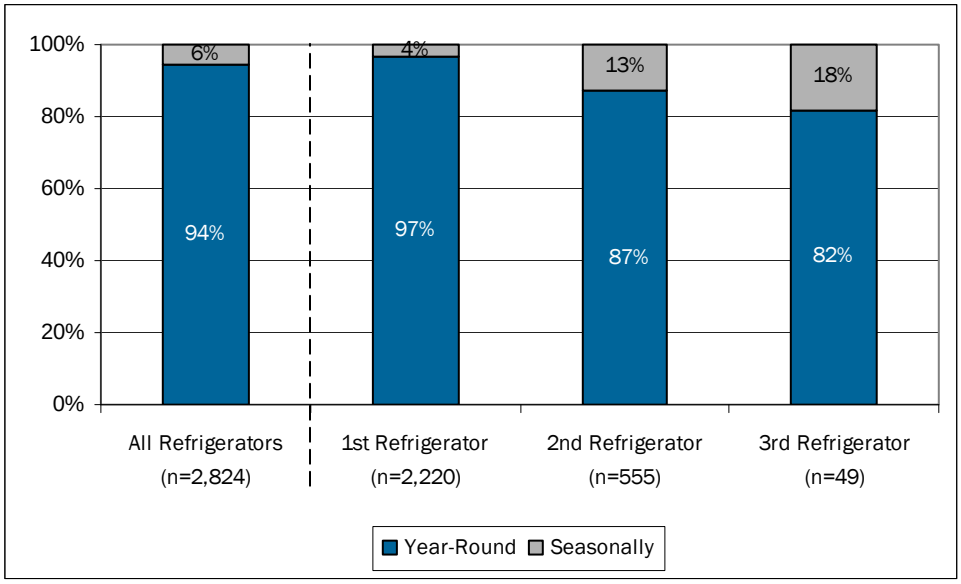


The high level of use among all refrigerators in customer homes is noteworthy. Over ninety percent (94%) of refrigerators owned by residential customers are used year-round.[6] Even second refrigerators (87%) and third refrigerators (82%) tend to be used year-round.

As expected, Cape Light Compact customers are more likely than other Massachusetts customers to use their refrigerator(s) seasonally.

[6] Note a relatively high non-response rate of 17%.

Figure 59: Frequency of Refrigerator Use

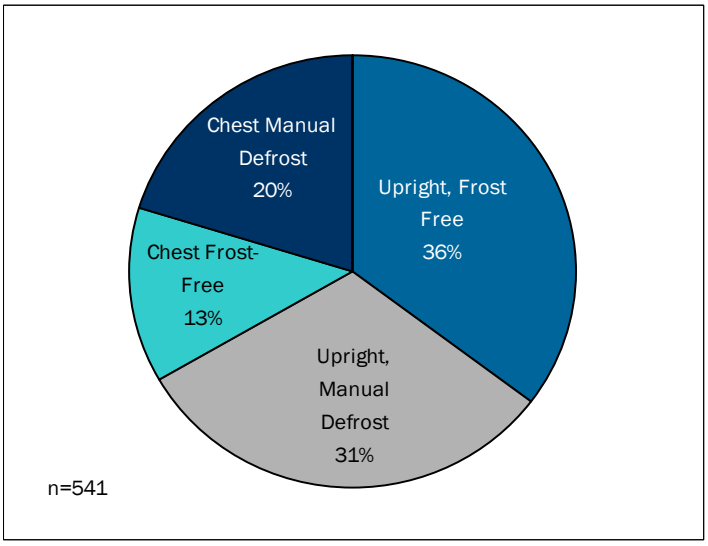


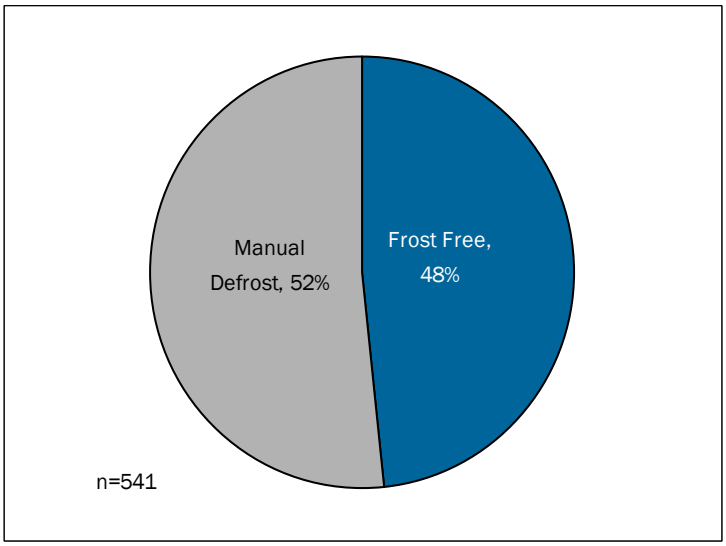
A small percentage of refrigerators dispense ice and water through the door (19%) or have an ice maker in the freezer (14%) (adj.). Not surprisingly, these features are more common in first refrigerators.

Freezers

Two-thirds of stand-alone freezers are upright models (67%), and about half are frost-free (48%). Frost-free models tend to be newer than manual defrost models.

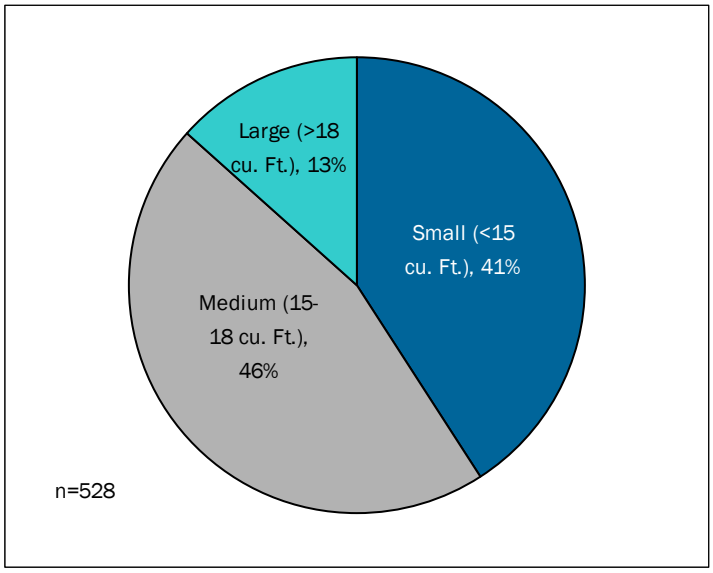
Figure 60: Freezer Style





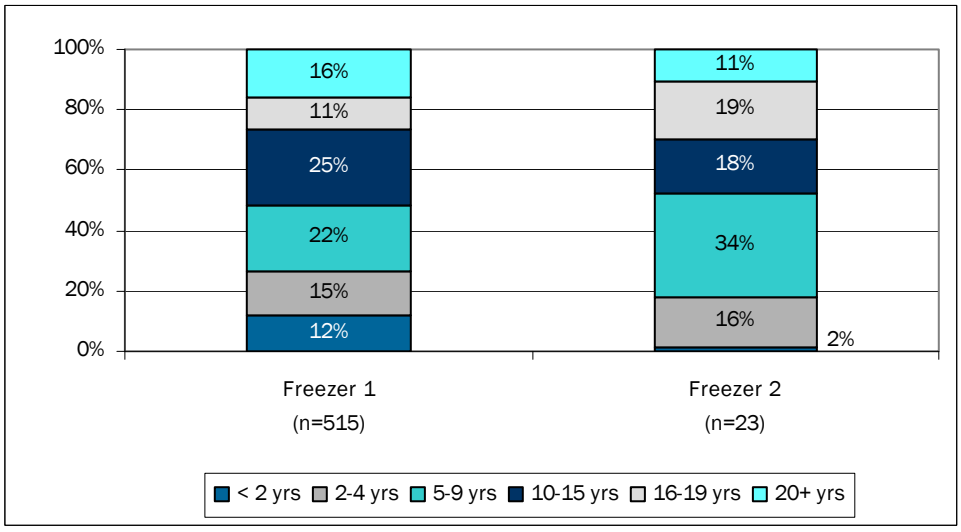
Most of the stand-alone freezers are small (less than 15 cu. Ft.; 41%) or medium-sized (15 to 18 cu. Ft.; 46%).

Figure 61: Freezer Size



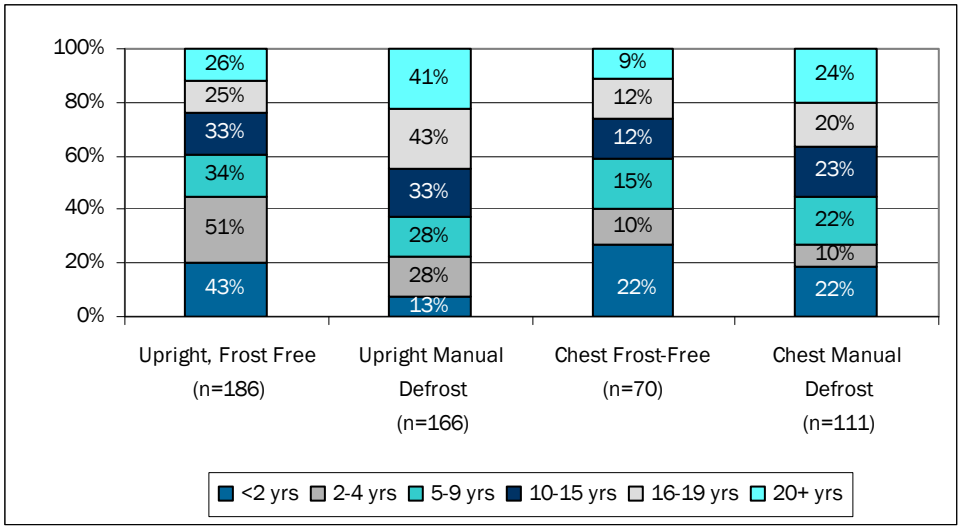
Overall, 52% percent of all stand-alone freezers are ten years of age or older. As expected, a greater percentage of primary than secondary stand-alone freezers are under four years old (27% compared to 18% of secondary freezers). It is interesting to note, however, that secondary freezers are not significantly older than primary ones. For example, 50% of secondary freezers are between two and nine years old. In addition, respondents report roughly the same percentage of primary and secondary freezers over 16 years old.

Figure 62: Age of Freezers



The highest percentage of older units are upright manual defrost models, while the largest percentage of recently purchased freezers are upright, frost free. Newer freezers tend to be smaller than older ones.

Figure 63: Age of Freezers by Freezer Type



Almost all stand-alone freezers (95%) are in use year-round.[7]

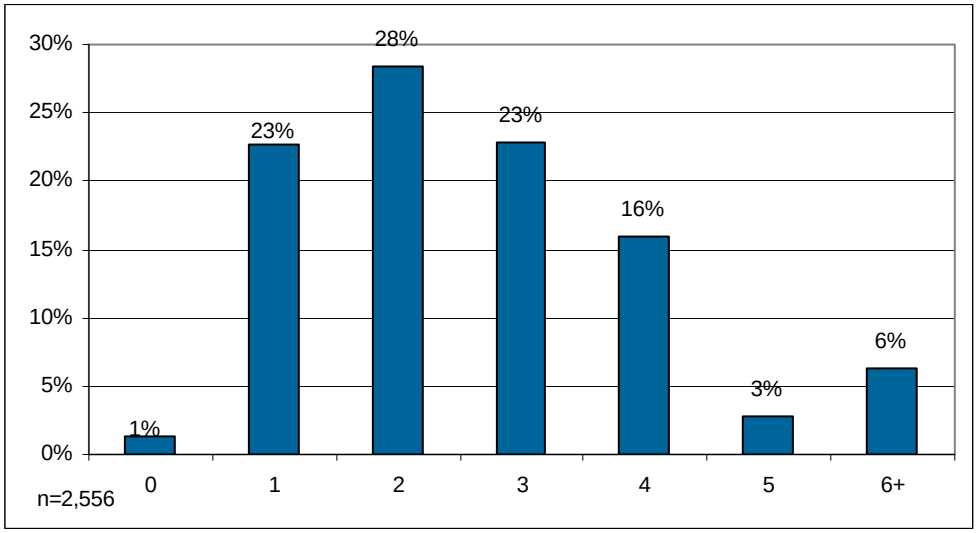
[7] Note a relatively high non-response rate of 20%.

9. ENTERTAINMENT EQUIPMENT

Televisions

Only 1% of Massachusetts residential customers do not have a television in their home (adj.). A large majority of customers (74%) have between one and three televisions in use (adj.). The average number of TVs in Massachusetts homes is 2.7 (adj.).

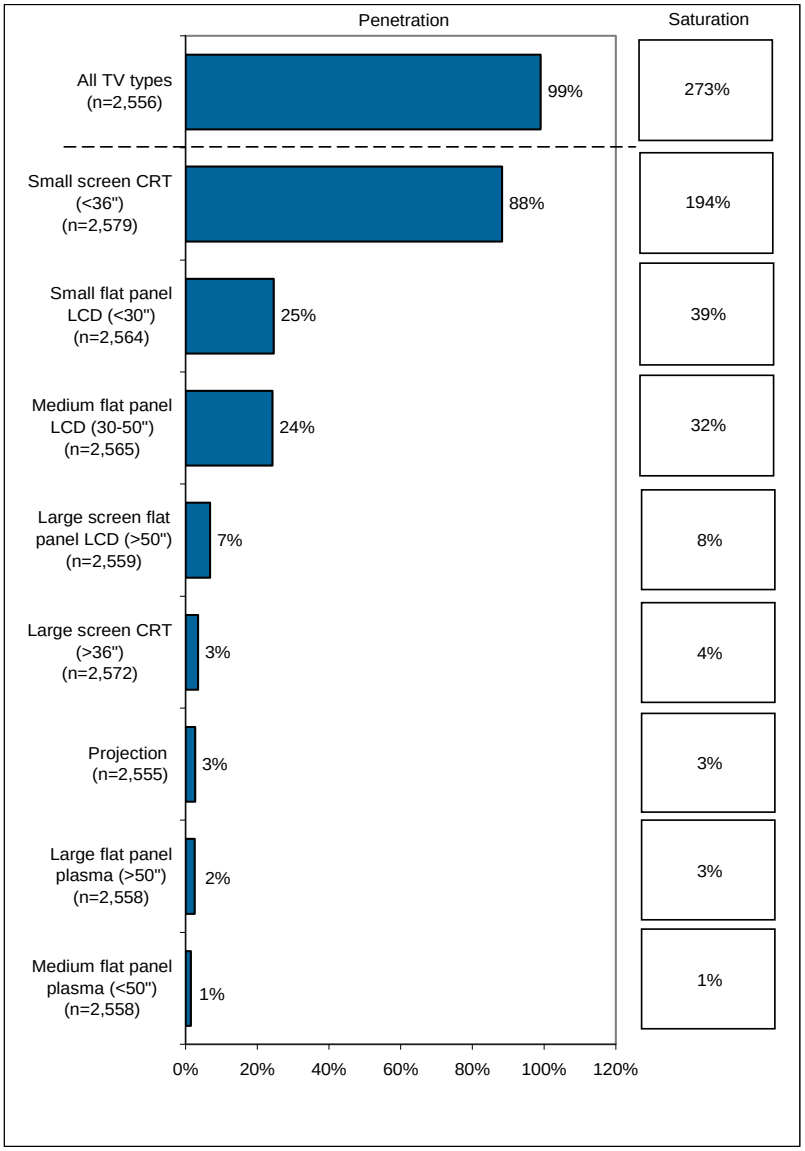
Figure 64. Number of TVs per Home (Adj.)



The most common type of TV is the standard tube (CRT) TV, used by 88% of customers (adj.). Almost one half of customers (45%) have TVs with LCD screens, and only a small portion have projection (3%) or plasma screen TVs (4%) (adj.). The order of popularity of the display types is expected and corresponds to their relative price. Customers in single-family homes and non-low income customers are more likely to own the larger and more expensive projection, LCD, and plasma TVs. For all television display types, a greater share of customers has small or medium screens compared to large screens.[8]

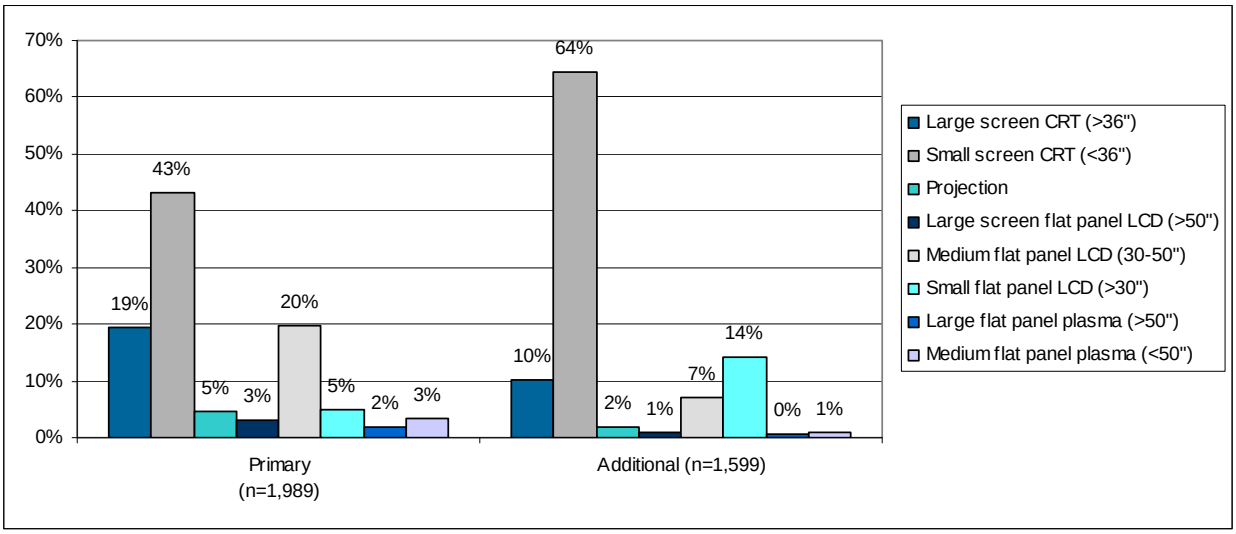
[8] Screen sizes are defined as follows: CRT – small: 36 inches or less, large: greater than 36 inches; LCD – small: less than 30 inches, medium: 30 to 50 inches, large: greater than 50 inches; Plasma: small: 50 inches or less, large: greater than 50 inches.

Figure 65. Penetration and Saturation of TVs by Display Type and Screen Size (Adj.)



The largest share of customers (43%) uses a small screen CRT television as their primary TV, followed by medium LCD TVs (20%), and large screen CRT TVs (19%). Small screen CRT TVs are also most commonly used for customers' additional TVs, followed by small screen LCD TVs. There is very little difference between customer's first additional and second additional televisions.

Figure 66. Primary and Additional TVs by Type

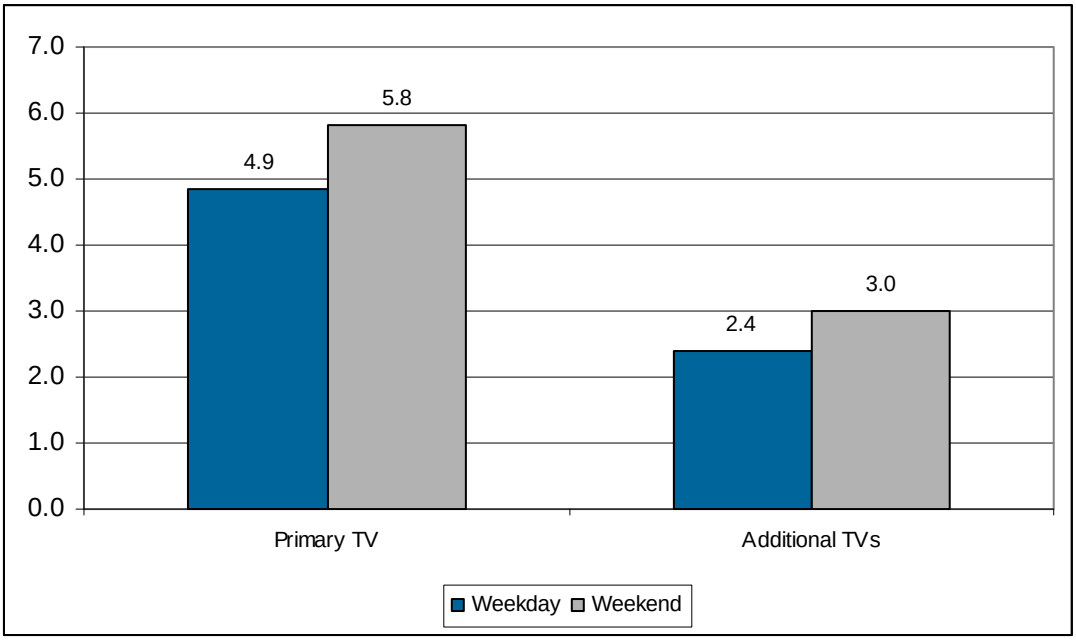


Television Use

On average, the primary televisions of Massachusetts residential customers are turned on 4.9 hours on weekdays and 5.8 hours on weekend days. Additional TVs are used less frequently than primary TVs, but are still turned on 2.4 hours on weekdays and 3.0 hours on weekend days. Low income customers tend to have their TVs turned on more frequently than other customers.

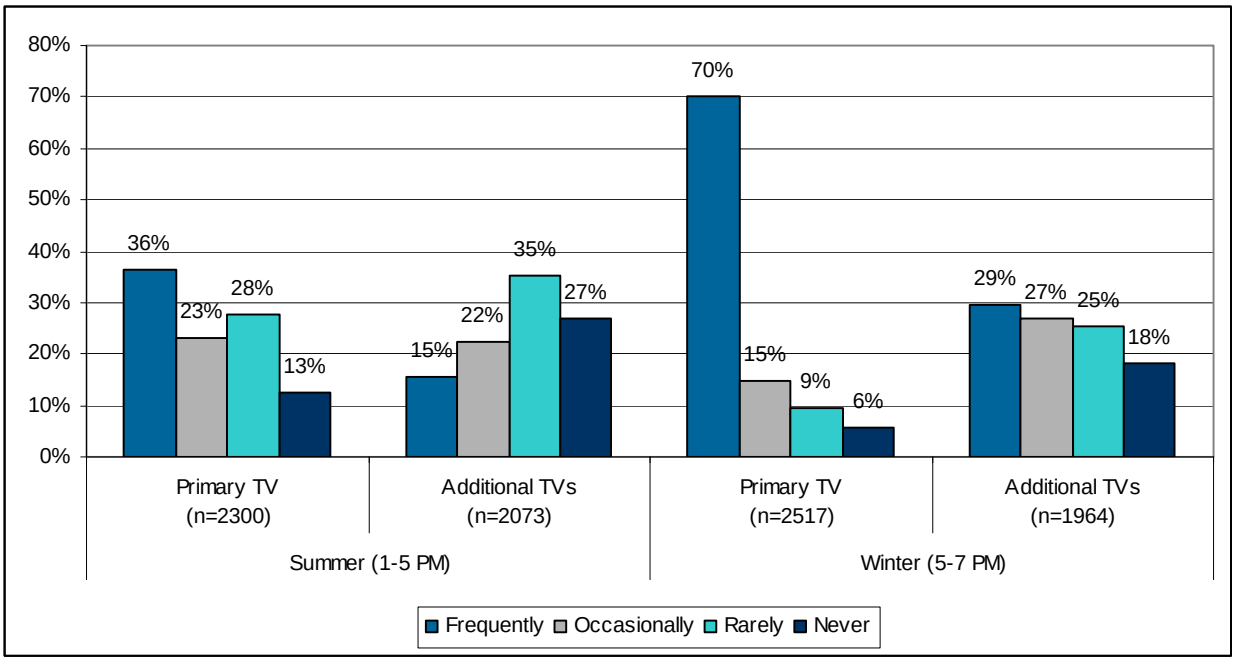
Nearly one-third of customers use their primary TV for six hours or more on weekdays; on weekends, almost half of customers use their primary TV for six hours or more.

Figure 67. Mean Hours of Television Viewing



Fifty-nine percent of customers use their primary TV frequently or occasionally during summer peak electricity demand times (between 1 and 5 p.m.). Eighty-five percent report that their primary TV is in use frequently or occasionally during winter peak electricity demand times (between 5 and 7 p.m.). Overall, customers use their televisions more during the winter peak period than the summer peak period.

Figure 68. Seasonal Use of TVs on Weekdays

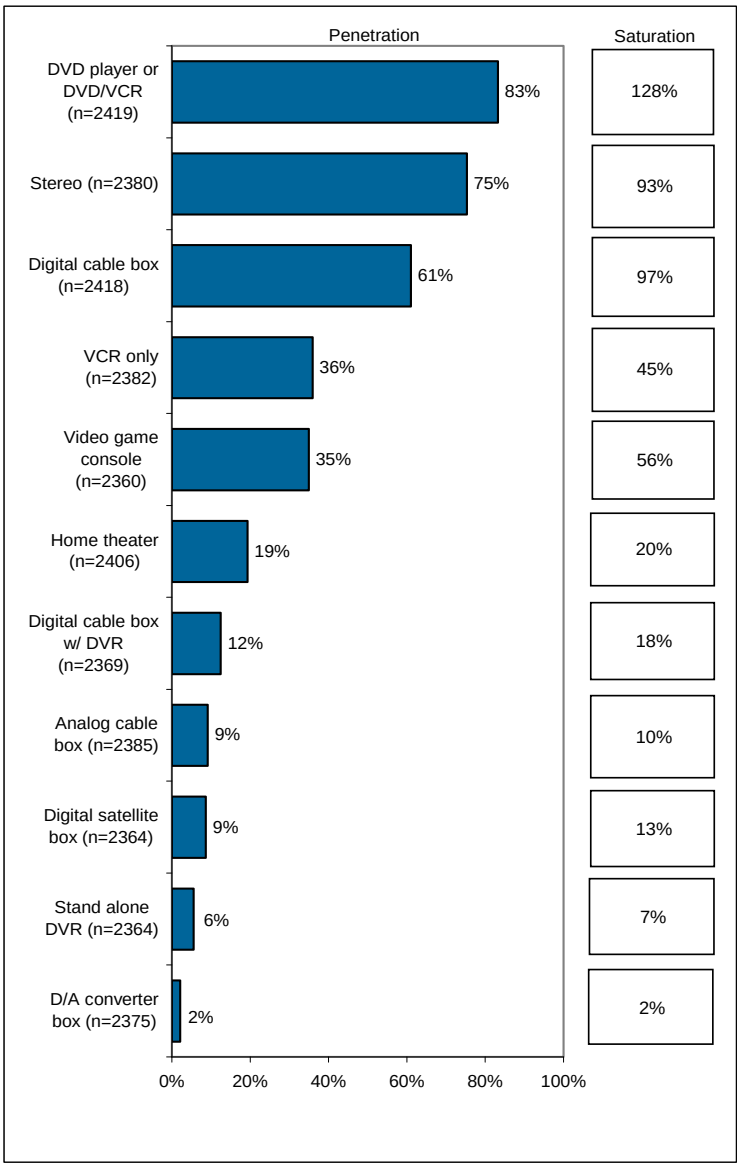


Home Audio and TV Accessories

More than three-quarters of residential customers (83%) use a DVD player in their home (adj.). Additionally, 75% of customers have a stereo and 61% have a digital cable box (adj.). Customers in single-family home are more likely to use home audio and TV accessories than those living in buildings with five or more units.

Customers are most likely to have multiple digital satellite boxes, digital cable boxes and digital/audio converter boxes in their homes. This is likely because these accessories are needed for each TV in the house.

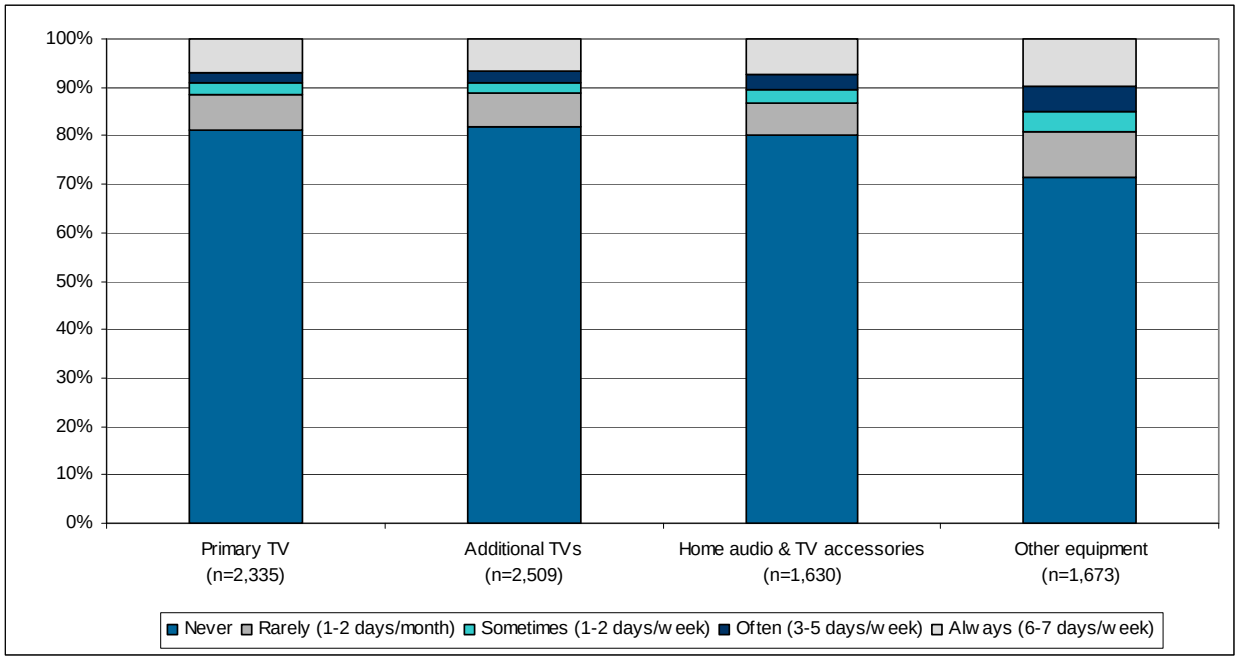
Figure 69. Penetration and Saturation of Home Audio and TV Accessories (Adj.)



Approximately 80% of customers never unplug or use a power strip to turn off their home entertainment electronics when not in use. These shares are consistent for the primary TV, additional TVs, and home audio and TV accessories. Customers are more likely to unplug "other" electronic equipment which includes home office equipment.

Customers in single-family homes are more likely to never unplug their electronic devices than customers in multifamily units.

Figure 70. Frequency of Unplugging Electronics or Turning Off at Power Strip



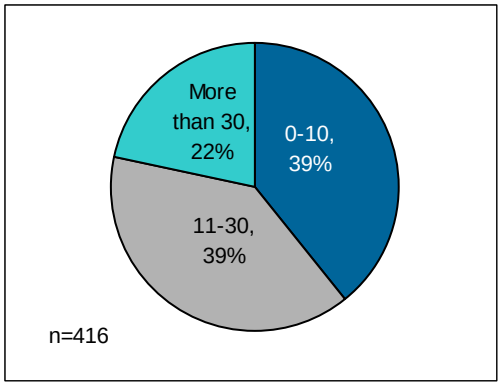
10. HOME OFFICE

Working from Home

Seventeen percent of Massachusetts residential customers report that they (or someone in their home) operate a business and/or work from their home. Customers living in single-family homes (19%) and non-low income customers are more likely to work out of their home than other customers.

Of the customers working from home, only 22% work more than 30 hours per week, while the remaining share is divided equally between those working 0-10 hours per week and those working 11-30 hours.

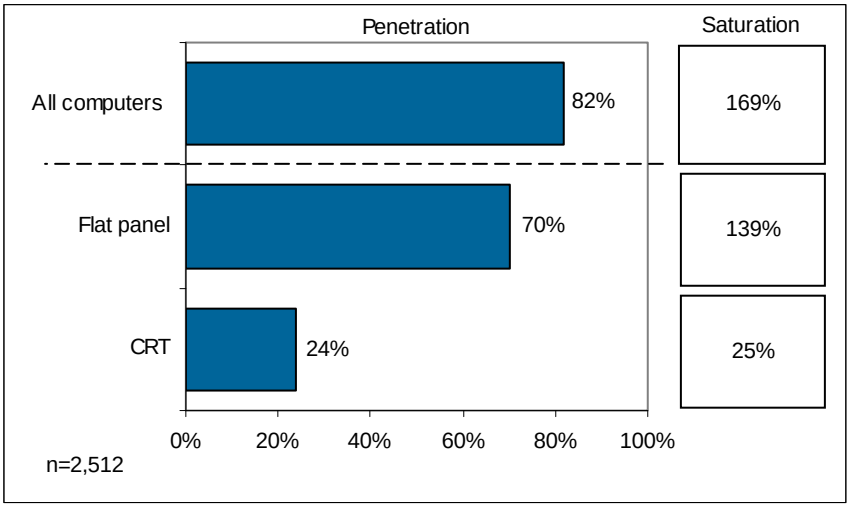
Figure 71. Numbers of Hours per Week Spent Working from Home



Computers

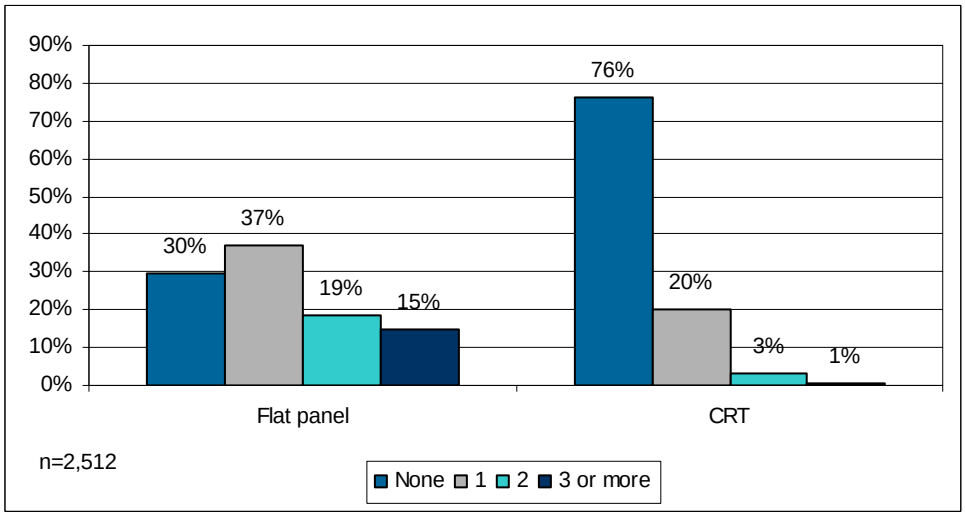
Eighty-two percent of Massachusetts residential customers have a computer in their home (adj.). Customers in single-family homes are more likely to have a computer (84%) than those living in multi-family buildings (80% for 2-4 unit buildings and 64% for 5+ unit buildings) (adj.). In addition, non-low income customers are more likely to have a computer. Flat panel monitors (70% of households) are much more prevalent than CRT monitors (24% of households) (adj.).

Figure 72. Penetration and Saturation of Computers (Adj.)



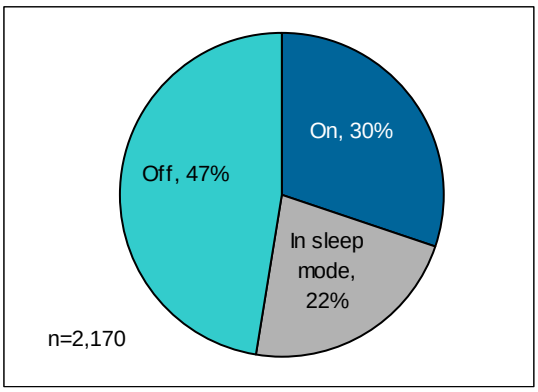
Nearly half of households (39%) only have one computer, while 42% have more than one (adj.). NSTAR customers and customers served by a municipal utility tend to have more computers than other Massachusetts customers.

Figure 73. Number of Computers in Home by Monitor Type (Adj.)



Fifty-seven percent of customers use the sleep mode on their computers while 43% do not. On average, customers keep their computers on 29% of the time and in sleep mode 21% of the time. Their computers are off the remaining 43% of time. The share of time a computer is on, in sleep mode, and off does not change substantially between multiple computers.

Figure 74. Mean Share of Time Computer is On, in Sleep Mode, and Off

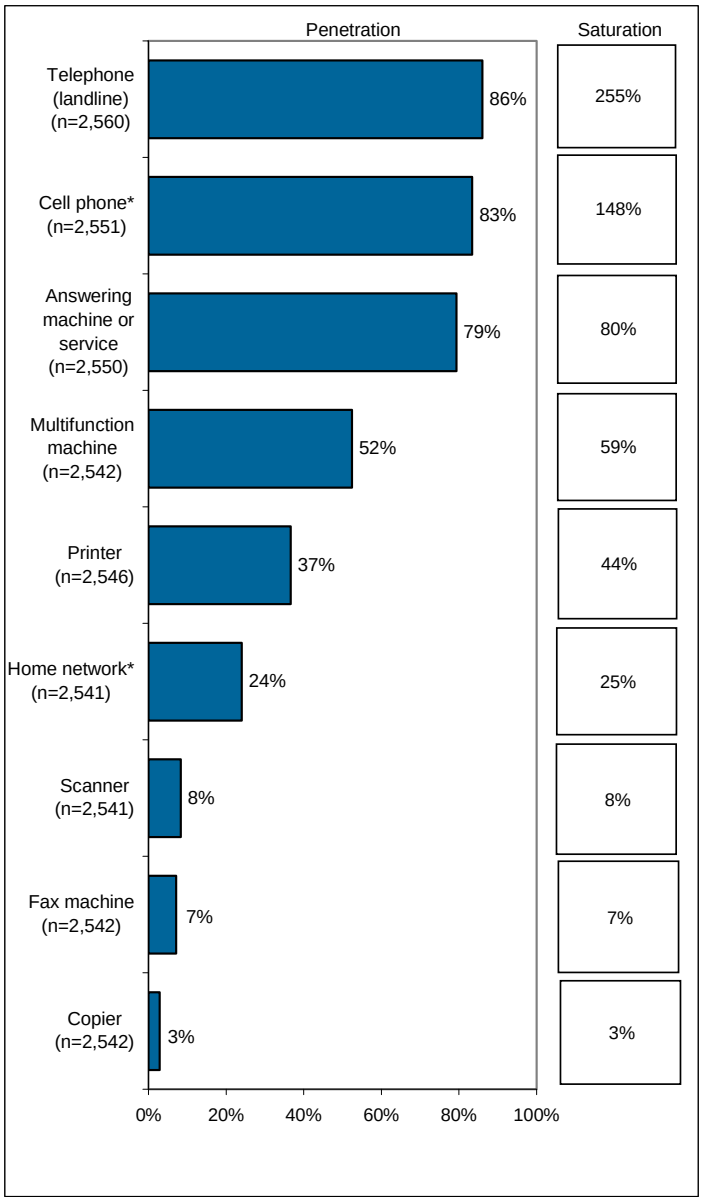


Other Home Office Equipment

The majority of customers have basic home office equipment, including a landline telephone (86%), a cell phone (83%), an answering machine (79%), and a multifunction machine (52%) (adj.). Other equipment, such as scanners, copiers, and fax machines, is less common and is used by less than one-quarter of customers.

NSTAR customers and customers in multi-family homes are less likely to have a landline than other Massachusetts customers. In addition, low income customers are less likely to have all types of home office equipment.

Figure 75. Penetration and Saturation of Home Office Equipment (Adj.)



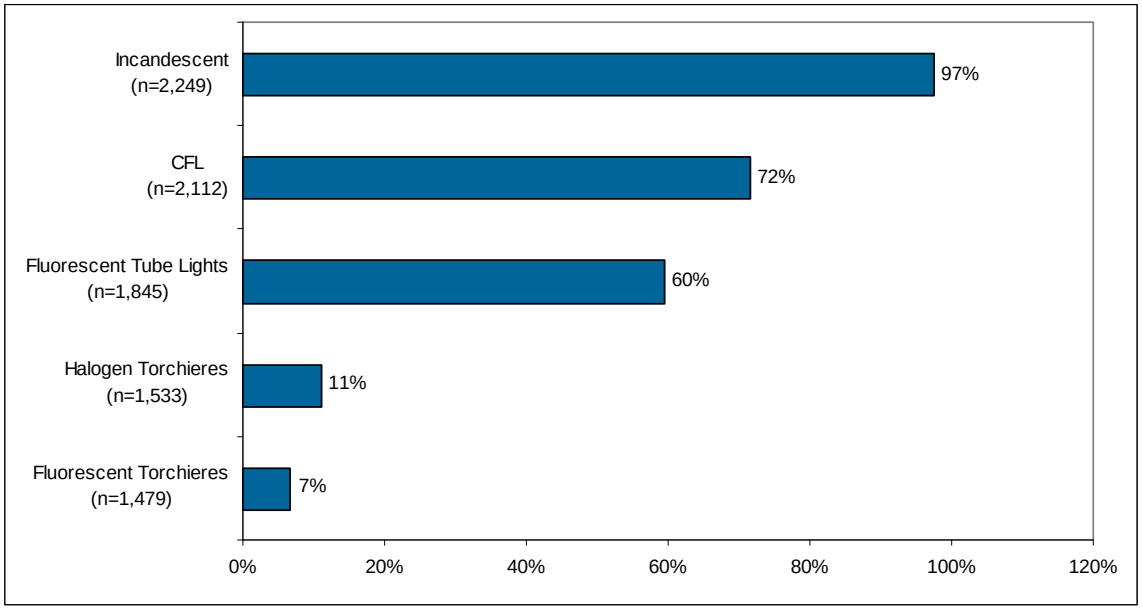
*Cell phone and Home network were not adjusted by the in-home verification.

11. LIGHTING

Lighting Penetration

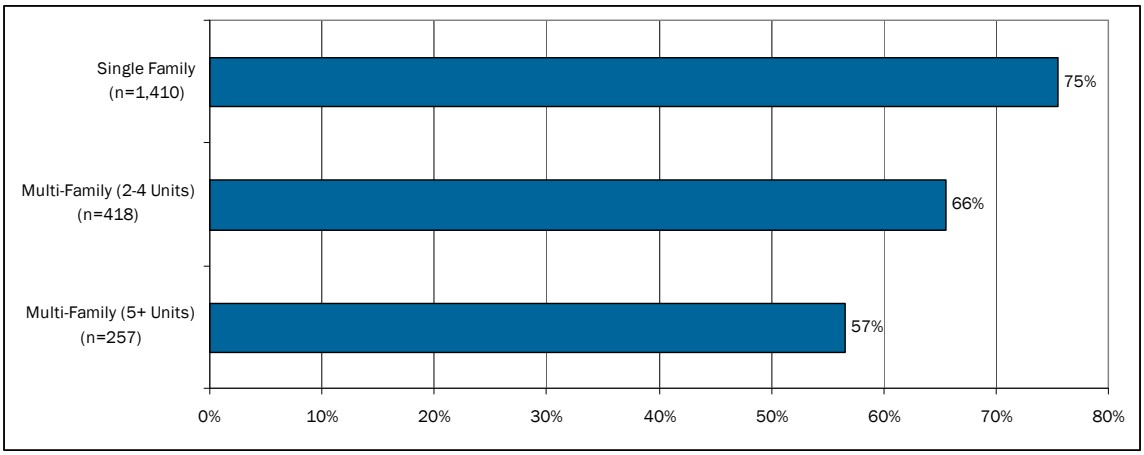
Ninety-seven percent of Massachusetts residents have standard incandescent light bulbs in their home (adj.). Additionally, 72% have compact fluorescent light bulbs (CFLs) and 60% have fluorescent tube lights (adj.). Much fewer households report having halogen torchieres (11%) and fluorescent torchieres (7%) (adj.).

Figure 76. Lighting Penetration (Adj.)



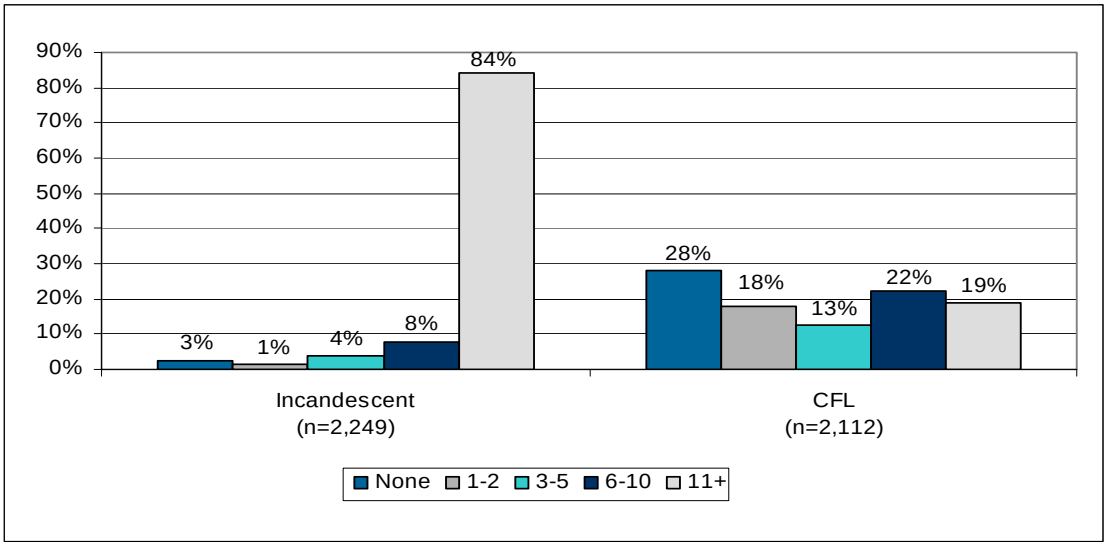
Customers living in single family homes are more likely to have CFLs in their home (75%) than customers living in multi-family residences (57% to 66%) (adj.). There are no differences in CFL penetration by income or education level.

Figure 77. CFL Penetration by Type of Residence (Adj.)



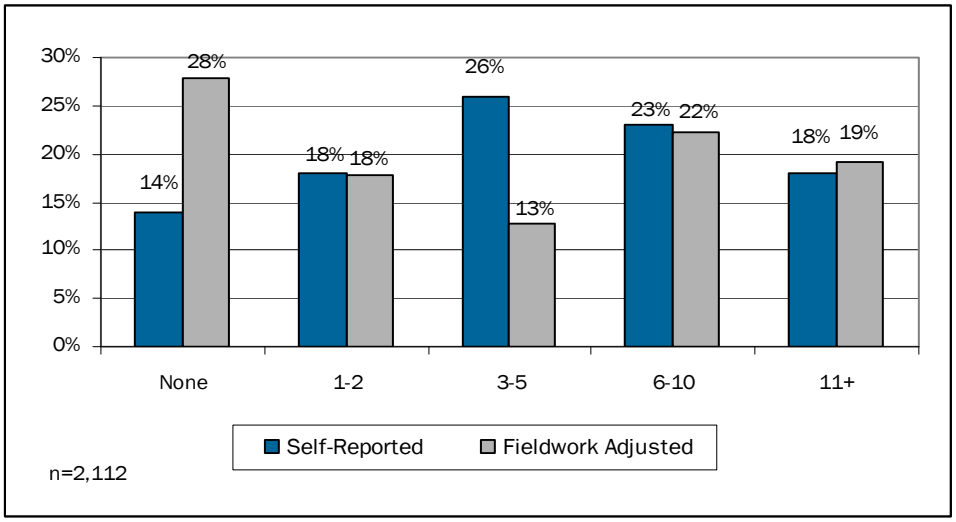
Residents have a large number of incandescent light bulbs in their homes. Eighty-four percent of customers have more than 10 incandescent light bulbs (adj.). Compact fluorescent light bulbs are also prevalent with 41% of respondents owning six or more CFL light bulbs (adj.). Single family homes and multi-families with two to four units are more likely to have eleven or more CFLs than multi-families with five or more units.

Figure 78. Number of Light Bulbs by Type of Lighting (Adj.)



The in-home verifications showed that customers with a large number of CFLs (six or more) are very accurate in reporting how many CFLs are installed in their home. However, a large number of customers seem to be unable to correctly identify CFLs: 14% of customers report having one or more CFLs while the in-home visit showed that they have none.

Figure 79. Comparison of Number of CFLs: Self-Reported v. Fieldwork Adjusted

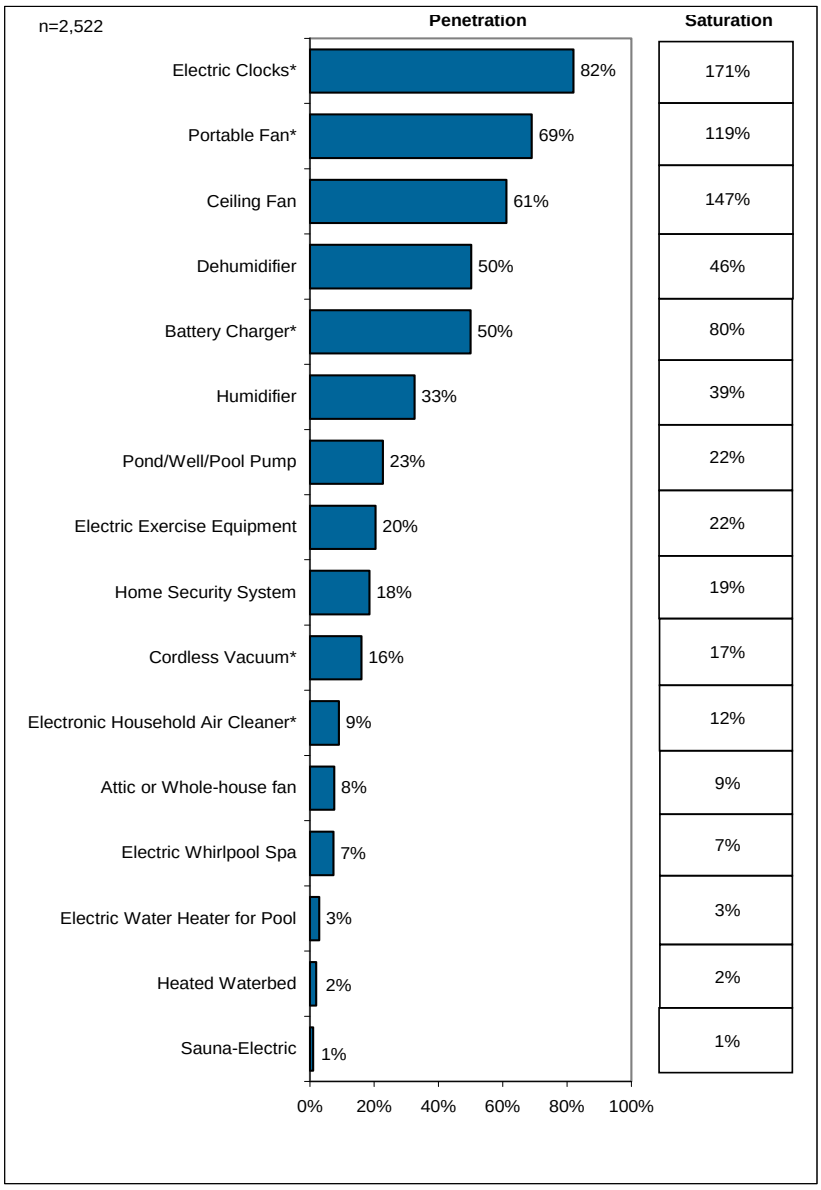


12. MISCELLANEOUS APPLIANCES

Penetration and Saturation

Massachusetts residential customers use a variety of electric appliances in their homes. Most households (82%) use at least one electric clock and/or clock radio in their home (adj.). Over 50% of residents also have one or more portable fans, ceiling fans, dehumidifiers, or battery chargers (adj.). Consistent with local climates, Cape Light Compact customers are more likely to have a dehumidifier (75%) but are less likely to have an attic or whole-house fan (5%) than other Massachusetts customers (adj.). Not surprisingly, customers living in single-family homes are more likely than customers living in other types of homes to use many of the miscellaneous appliances about which the survey asked, including: attic or whole-house fans, humidifiers, dehumidifiers, heated waterbeds, electric whirlpool spas, portable battery charges, home security systems, electric exercise equipment, electric clocks, and pool-related electric appliances. Conversely, low income customers are less likely to own most of these appliances.

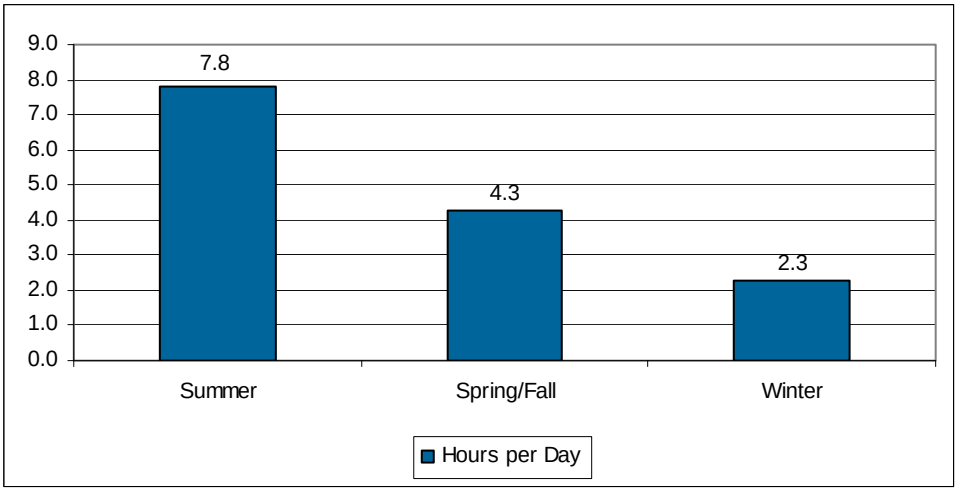
Figure 80. Penetration and Saturation of Miscellaneous Appliances (Adj.)



*In home verifications not available for these products.

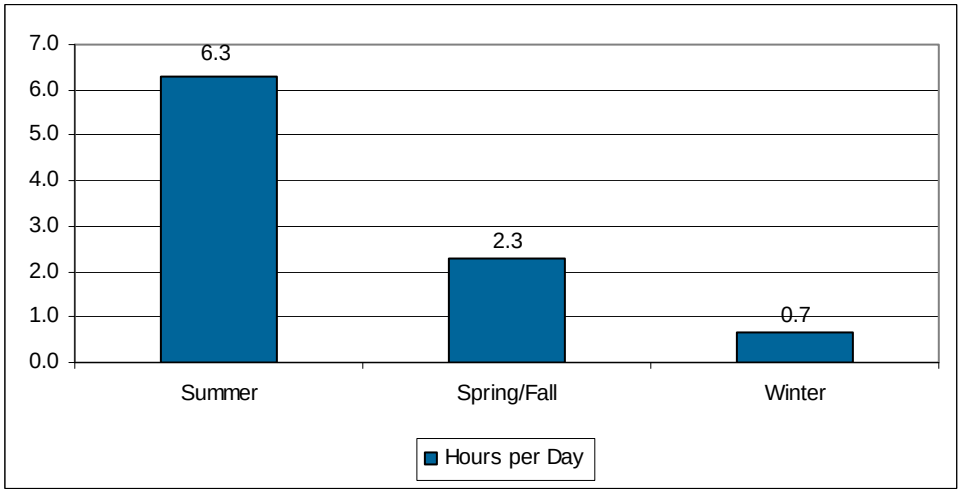
Less than half of Massachusetts households (46%) use one or more dehumidifiers in their home. Of those who do use dehumidifiers, they are used most often during the summer months. On average residents use their dehumidifiers 7.8 hours per day during summer and 2.3 hours per day during winter. Cape Light Compact customers report more frequent use of dehumidifiers in the summer (9.2 hours on average) than other Massachusetts customers.

Figure 81. Average Dehumidifier Usage



As expected the use of pool pumps is also heavily swayed towards the summer months. Those who use pool pumps use them an average of 6.3 hours per day in the summer, but only 0.7 hours per day in the winter.

Figure 82. Average Pool Pump Usage

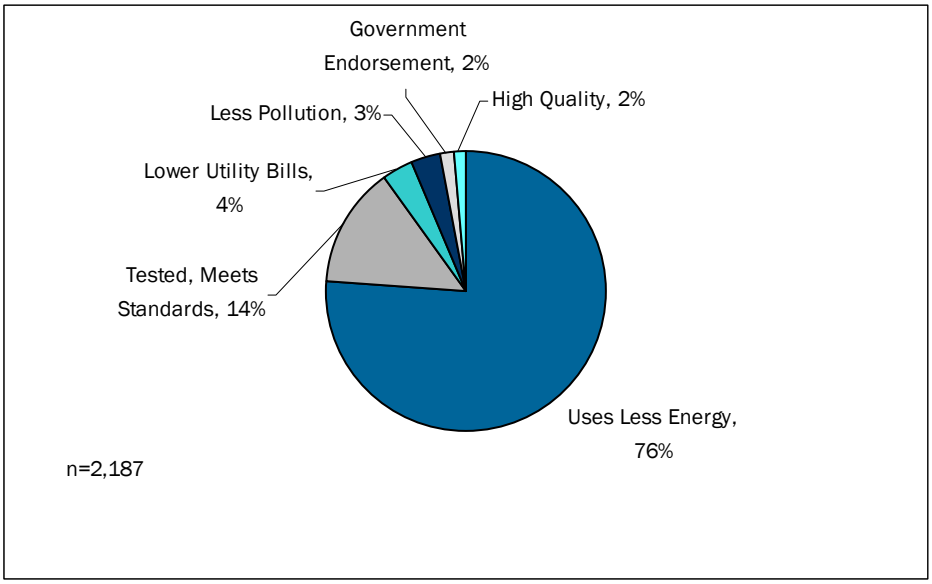


13. ENERGY EFFICIENCY

ENERGY STAR® Label

Eighty percent of Massachusetts' residential customers are either very or somewhat familiar with the ENERGY STAR® label; only 7% indicate they have never seen it. Non-low income customers (85%) are more likely to be familiar with the label than low income customers (67%). Of those who have seen the label before, 76% believe that "uses less energy" is the best description of the label's meaning; 14% think the label signifies that a product has been tested and meets standards. These findings indicate strong awareness of the ENERGY STAR® label and high levels of knowledge regarding its meaning. Interestingly, customers who consider themselves not very familiar with the label are as knowledgeable about the label's meaning as customers who consider themselves somewhat or very familiar.

Figure 83. Meaning of the ENERGY STAR® Label*



*Of customers who have seen the ENERGY STAR® label before.

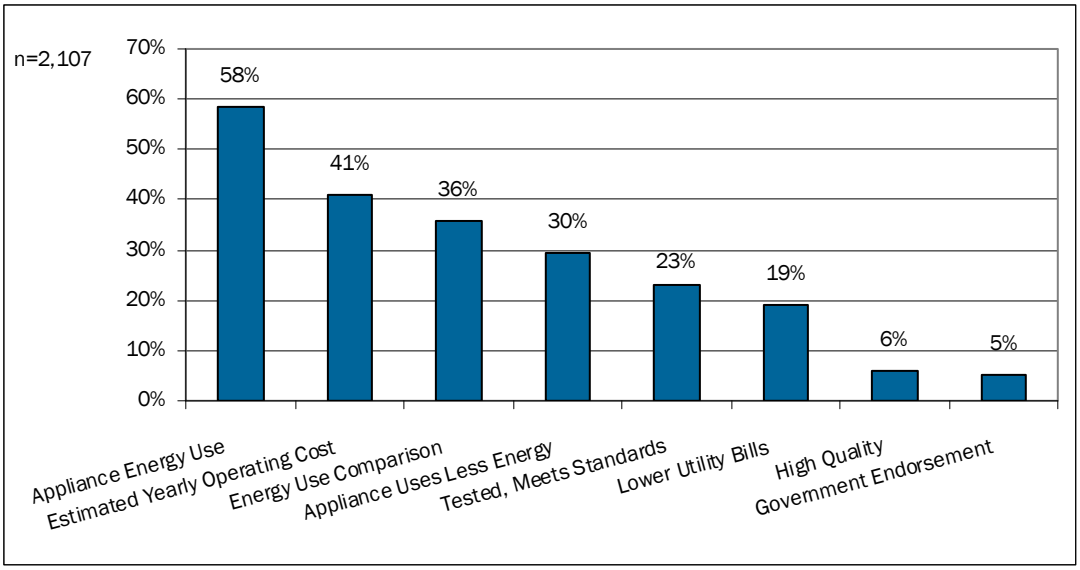
Two-thirds of customers who have seen the ENERGY STAR® label before report that the label has influenced them in their decision to purchase a particular product. Not surprisingly, customers very or somewhat familiar with the label are more likely to have been influenced in their purchase decision (75%) than customers less familiar (22%).

EnergyGuide Label

Seventy-six percent of residential customers are either very or somewhat familiar with the EnergyGuide label. Only a small percentage of customers indicate they have never seen it (7%), and residents of multi-unit buildings and low income customers are more likely to be among this group. In contrast to the ENERGY STAR® label, there is a wide range of interpretation regarding the information that the EnergyGuide label provides. Over half of

customers who have seen the label before know that it shows the appliance's energy use; fewer customers are aware of the other meanings of the label: 41% correctly identify "estimated yearly operating costs" while 36% know that the label shows a comparison of energy use.

Figure 84. Meaning of the EnergyGuide Label
(Multiple Response)*

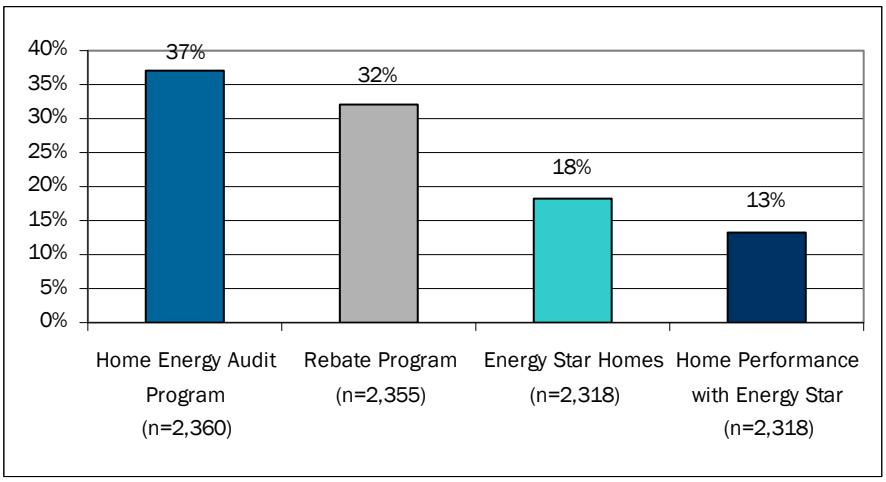


*Of customers who have seen the EnergyGuide label before.

Knowledge of Energy Efficiency Programs

Knowledge of utility-sponsored energy efficiency programs is low with a majority of customers claiming they are not very or not at all familiar with the programs included in the survey. Customers are most familiar with the Home Energy Audit Program (37%) and rebate programs (32%). In contrast, less than 20% of customers consider themselves familiar with the ENERGY STAR® Homes and Home Performance with ENERGY STAR® programs. In all cases, however, awareness of the programs is greater among customers familiar with the ENERGY STAR® label than those unfamiliar. Low income customers are less familiar with all programs than non-low income customers.

Figure 85. Familiarity with Other Energy Efficiency Programs*

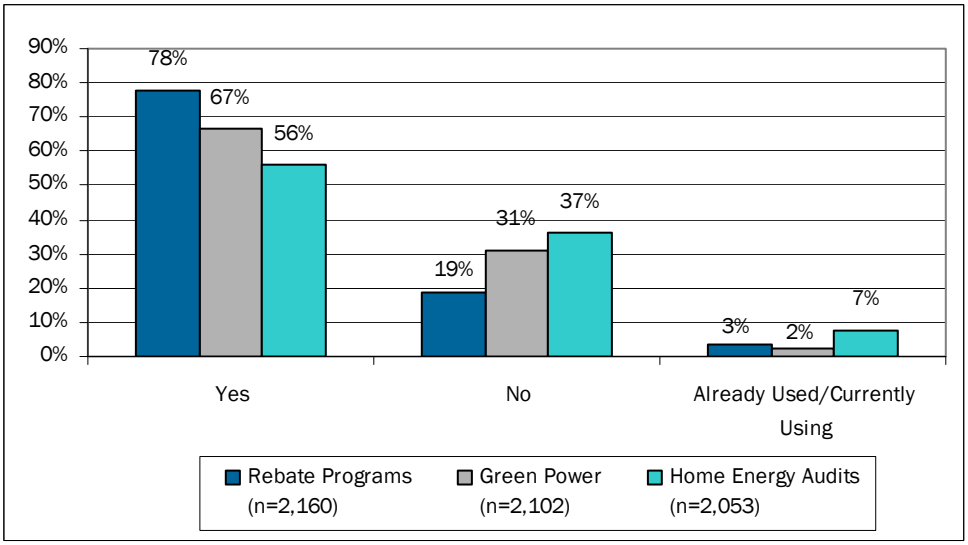


*Includes "very familiar" and "somewhat familiar" responses.

Interest in Energy Efficiency Products and Services

While awareness of utility-sponsored energy efficiency programs is relatively low, interest levels among Massachusetts customers are high: 78% of customers are interested in rebates for the purchase of energy efficient products or energy efficient home improvements; 67% are interested in green power; and 56% are interested in home energy audits. Non-low income customers are more interested in all types of programs than low income customers. Only a small percentage of customers (2% to 7%) have already utilized these services, indicating significant growth potential for these types of programs.

Figure 86. Customer Interest in Energy Efficiency Products and Services



Product Choices for Rebate Programs

The Home Energy Survey asked customers to rank the top four products that should receive rebates through an energy efficiency program. Heating systems and windows are the most popular choices, with 65% and 60% of customers selecting these measures as one of their four top choices. These two measures are also the most popular first choices of customers, with 27% and 16%, respectively. Other measures ranked in the top four by more than one-third of customers include refrigerators/freezers (53%), insulation (43%), light bulbs and fixtures (36%), and clothes washers (35%).

Compared to non-low income customers, low income customers are more likely to say that refrigerators and freezers (59%), light bulbs and fixtures (53%), and room air conditioners (30%) should receive rebates.

Table 5. Interest in Product Rebates

Energy Efficient Products	1st (n=1,892)	2nd (n=1,839)	3rd (n=1,813)	4th (n=1,785)	Any Rank (n=1,892)
Heating Systems	27%	17%	14%	9%	65%
Windows	16%	18%	16%	11%	60%
Refrigerators/Freezers	13%	12%	17%	14%	53%
Insulation	10%	12%	13%	9%	43%
Light Bulbs and Fixtures	14%	5%	7%	15%	39%
Clothes Washers	5%	10%	9%	12%	35%
Central Cooling Systems	3%	10%	7%	7%	26%
Solar Domestic Water Heater	7%	4%	4%	6%	21%
Room Air Conditioners	2%	4%	5%	6%	16%
Dishwashers	<1%	4%	6%	7%	16%
Geothermal Heat Pump	3%	3%	1%	3%	10%
Pool Pumps	<1%	<1%	<1%	<1%	1%
Other	<1%	<1%	<1%	1%	2%

14. PROFILE OF RESPONDENTS

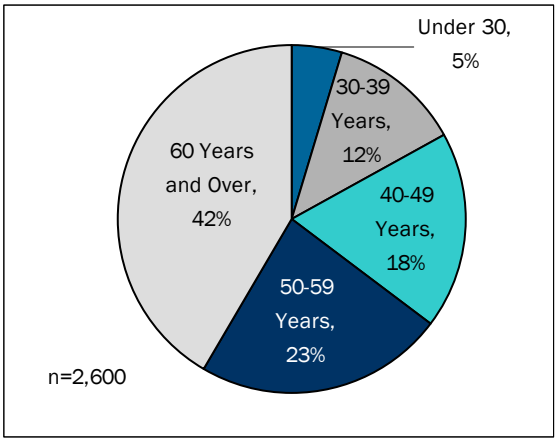
This section presents information about the residential customers that participated in the Home Energy Survey. In addition to providing key information about participating customer demographics, comparing this information with Massachusetts' census data provides an indication of how representative survey respondents are of the general Massachusetts population.

As described in more detail below, Home Energy Survey respondents are generally more educated and speak English at home to a larger extent than all Massachusetts residents.

Respondent Age

Over 40% of survey respondents are 60 years of age or older, compared to 17% who are under 40. The average age of survey respondents is approximately 52 years. Customers served by Cape Light Compact and the municipal utilities tend to be older than other Massachusetts customers.

Figure 87. Head-of-Household Age

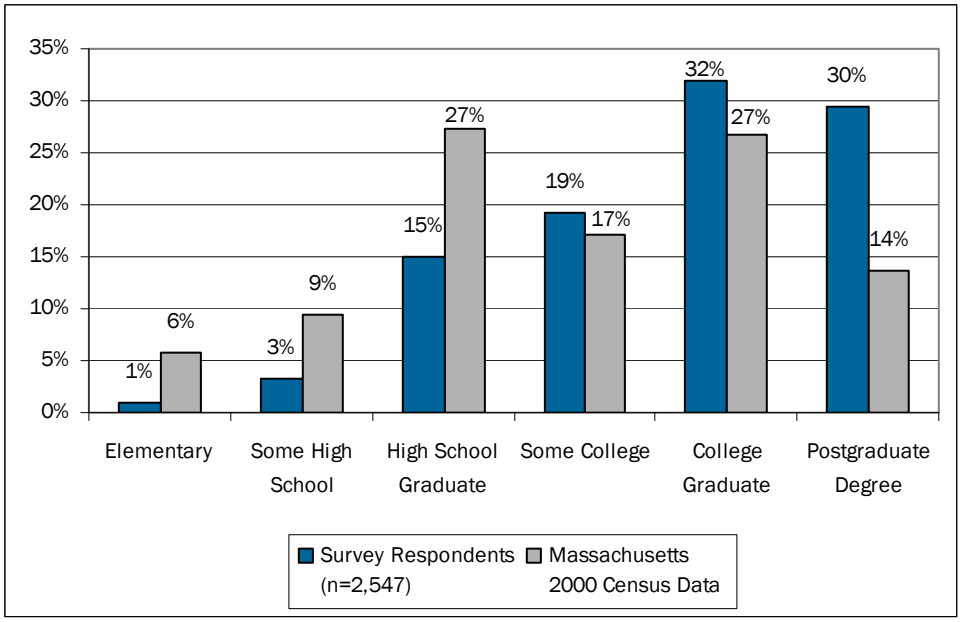


Educational Attainment

Education levels among survey respondents are high compared to Massachusetts averages. Almost two-thirds (62%) of survey respondents have a college or graduate degree, compared to 41% of Massachusetts adults 25 year or older[9]. Conversely, fewer survey respondents have a high school degree or less compared to the Massachusetts adult population.

[9] U.S. Census Bureau. "DP-2 Profile of Selected Social Characteristics: 2000." U.S. Census Bureau, Washington, DC. 2000. Online at http://factfinder.census.gov/servlet/QTTable?_bm=n&_lang=en&qr_name=DEC_2000_SF3_U_DP2&ds_name=DEC_2000_SF3_U&geo_id=04000US25

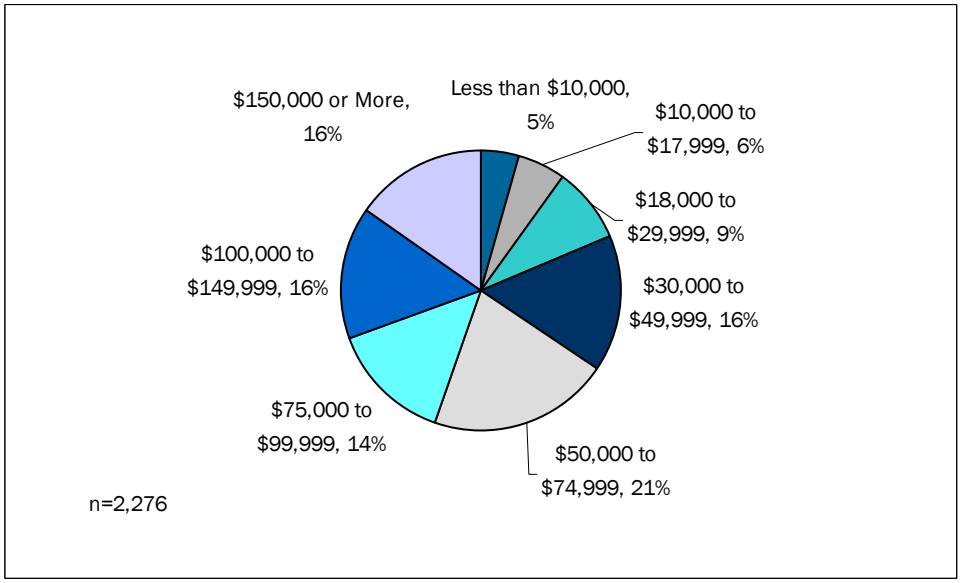
Figure 88. Educational Attainment among Respondents and Statewide



Household Income

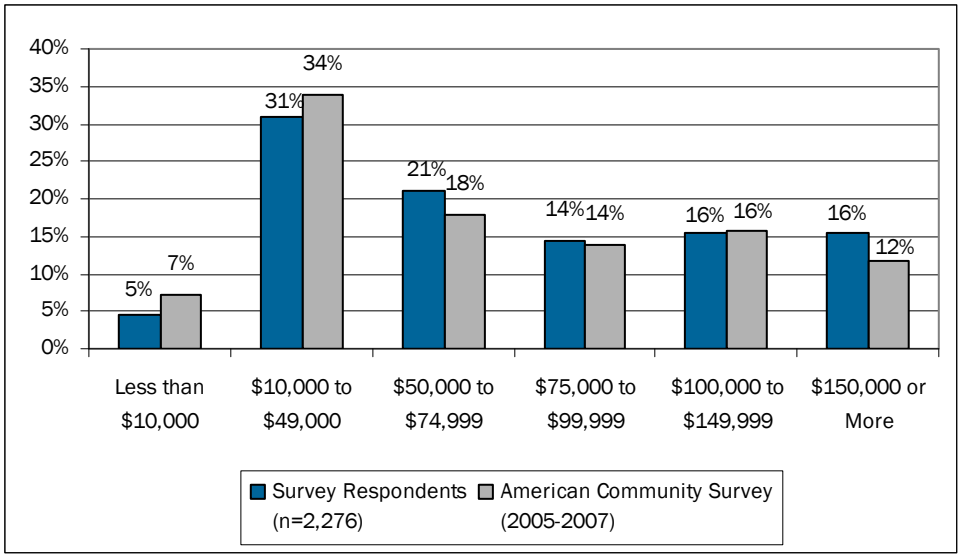
Fifteen percent of survey respondents did not provide information about their household income. Among respondents who did share earnings data, 19% earned less than $30,000 and almost one-third earned over $100,000 in 2007. Cape Light Compact, NSTAR, and municipal utility customers report higher household incomes than National Grid, Unitil, and WMECO customers.

Figure 89. Annual Household Income



The annual household income of survey respondents is generally consistent with that of all Massachusetts households. The highest income bracket ($150,000 or more) is slightly over-represented in the survey, while the lower income brackets ($49,000 or less) are slightly under-represented.

Figure 90. Annual Household Income Comparison with Massachusetts Residents



*The income category $10,000-$49,000 was created as a result of differences between the income categories used in the Home Energy Survey and those used by the U.S. Census. Note that American Community Survey income is from 2005-2007 while survey responses are for 2007.[10]

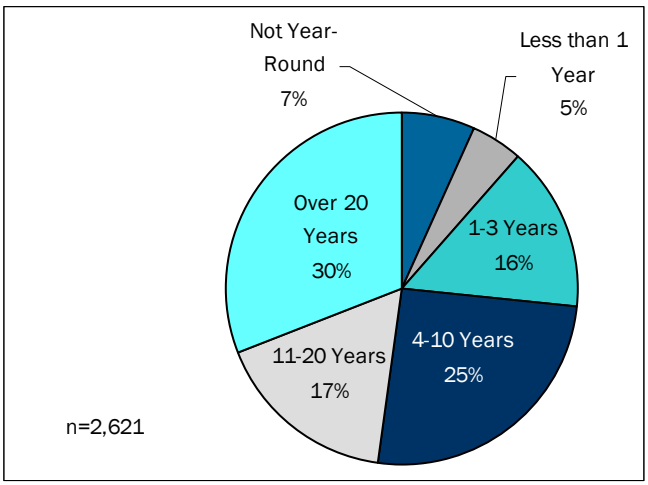
Additional Household Characteristics

Consistent with findings regarding the age of Home Energy Survey respondents, participating customers have lived in their homes for a long period of time. Close to one-half of survey respondents currently live in a home they have occupied for more than 10 years, and one-third live in homes they have occupied for more than 20 years.

Not surprisingly, Cape Light Compact has the largest percentage of seasonal residents of all electric service providers (42%). NSTAR customers are more likely than other Massachusetts customers to have lived in their homes for between one and three years.

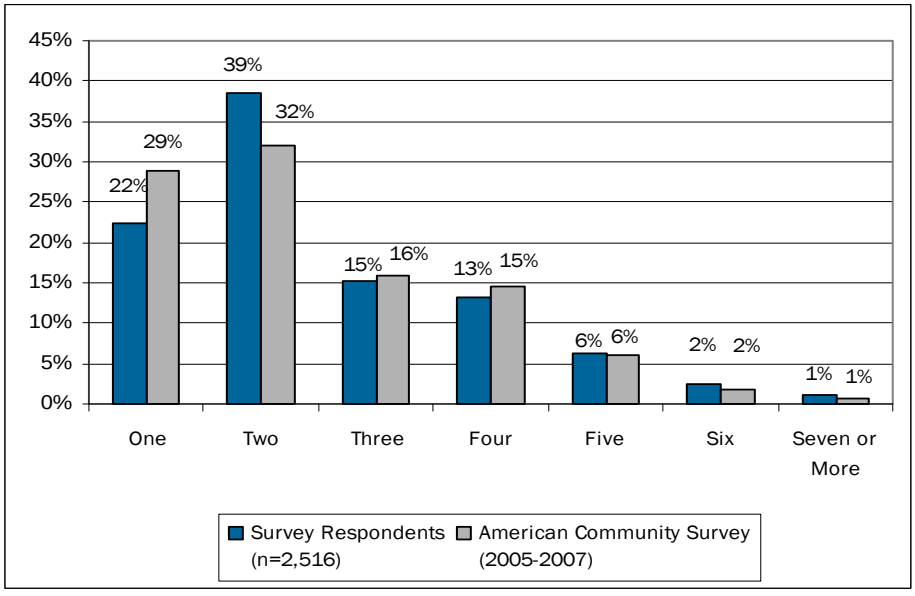
[10] U.S. Census Bureau. "2005-2007 American Community Survey." U.S. Census Bureau, Washington, DC. 2007. Online at http://factfinder.census.gov/servlet/DatasetMainPageServlet?_lang=en&_ts=254062574861&_ds_name=ACS_2007_3YR_G00_&_program=.

Figure 91. Years in Surveyed Home



Over 61% of survey respondents live in households of one or two people. An additional 28% of households consist of three or four members. These household sizes are very similar to all Massachusetts households. Twenty-eight percent of households have at least one member under the age of 18, and 44% of households have at least one member 60 years or older. Survey respondents are also representative of the State population in terms of average household size (2.6 and 2.5, respectively).[11]

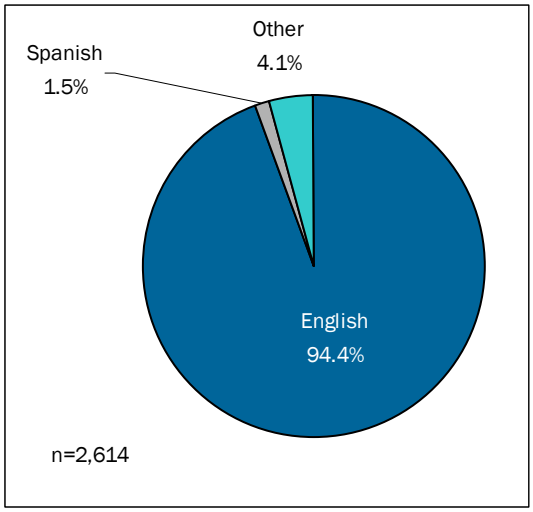
Figure 92. Household Size



[11] U.S. Census Bureau. "U.S. Census Bureau: State and County QuickFacts." U.S. Census Bureau, Washington, DC. Revised July 2008. Online at http://quickfacts.census.gov/qfd/states/25000.html.

Respondents overwhelmingly indicate that English is the primary language spoken in their homes (94.4%). While Spanish is the second most common primary language, it is used by only 1.5% of respondents. Respondents served by WMECO are more likely to speak Spanish than respondents located in the Cape Light Compact, National Grid and NSTAR service territories.

Figure 93. Primary Language Spoken at Home



A larger percentage of Massachusetts residents speak Spanish at home (6%) than survey respondents.[12] The fact that the Home Energy Survey was administered in English only may account for this difference.

[12] U.S. Census Bureau. "DP-2 Profile of Selected Social Characteristics: 2000."

DATA SUMMARY BY ELECTRIC ENERGY EFFICIENCY PROGRAM ADMINISTRATOR

The following tables summarize responses to the mail/Internet survey for all Massachusetts customers ("Total" column) and by electric energy efficiency program administrator. Customers served by municipal utilities are grouped under the heading "Munis". The final column presents the adjustment factor developed through the in-home verification visits. For explanations of the development and use of adjustment factors, please refer to the Methodology section.

The number of responses for each administrator ("n" in the table headers) represents the total number of surveys completed by the administrator's customers. It should be noted that not every respondent answered every question; therefore, the number of responses for any one question might be smaller than the number presented in the table header. Volume 2 of this report presents more detail about the number of responses for each question as well as significant differences between comparison groups.

The tables are organized by the same topics used in the main body of the report. The following three sections present the same information by the type of building the customer lives in, the customer's primary heating fuel, and the customer's income level, respectively.

Table 6. Home Characteristics – by Electric Energy Efficiency Program Administrator

	Total (n=2,667)	CLC (n=224)	NGRID (n=1,156)	NSTAR (n=830)	Unitil (n=133)	WMECO (n=204)	Munis (n=120)	Adj. Factor
Building Type								
SF Detached	67%	87%	68%	56%	76%	73%	88%	0.99
MF (2-4 units)	20%	8%	19%	27%	19%	21%	8%	0.87
MF (5+ units)	12%	4%	11%	17%	4%	5%	5%	1.18
Other	1%	<1%	1%	1%	1%	1%	0%	0.50
Own Home	81%	97%	81%	75%	87%	82%	95%	--
Year-Round Occupancy	93%	58%	95%	96%	100%	96%	98%	--
Mean No. of Rooms[A]	6.4	6.5	6.3	6.3	6.3	6.2	7.2	1.05
Mean Dwelling Size (sq. ft)	1,866	1,926	1,827	1,874	1,735	1,763	2,181	--
Home Built								
Before 1930	26%	6%	24%	34%	27%	28%	23%	--
1930-1969	36%	26%	36%	36%	42%	39%	42%	--
1970-1999	30%	58%	32%	22%	24%	25%	29%	--
2000 or later	8%	10%	8%	8%	7%	8%	6%	--
Home Remodeled in Last 3 Years	25%	28%	26%	24%	32%	24%	28%	--
Natural Gas Service Available	54%	64%	48%	62%	55%	43%	53%	1.14

[A] Excludes bathrooms, halls, pantries, unheated rooms, and garages.

Table 7. Space Heating – by Electric Energy Efficiency Program Administrator

	Total (n=2,667)	CLC (n=224)	NGRID (n=1,156)	NSTAR (n=830)	Unitil (n=133)	WMECO (n=204)	Munis (n=120)	Adj. Factor
Home Heating								
Pay to Heat Home	92%	97%	92%	89%	99%	97%	98%	0.98
Heat Part of Rent	7%	3%	7%	10%	1%	3%	2%	--
No Heat	1%	<1%	1%	1%	--	--	--	--
Primary Heating System Type[A]								
Natural Gas	49%	60%	44%	59%	43%	37%	41%	1.06
Electric	8%	9%	8%	8%	2%	10%	6%	0.99
Oil	39%	26%	43%	31%	51%	43%	50%	0.94
Bottled Gas	2%	4%	3%	1%	<1%	5%	1%	0.66
Wood or Coal	1%	2%	1%	--	1%	3%	1%	--
Other	1%	--	1%	<1%	3%	2%	1%	0.50
Mean Age of Primary Heating System[A]	12.3	12.2	12.5	12.0	13.0	11.2	13.8	--
Uses Additional Heating System	32%	28%	32%	30%	43%	38%	33%	0.87
Additional Heating System Type[AB]								
Natural Gas	2%	6%	1%	1%	3%	4%	5%	--
Electric	46%	47%	39%	61%	22%	38%	45%	--
Oil	6%	--	6%	5%	6%	13%	3%	--
Bottled Gas	10%	9%	9%	10%	4%	13%	11%	--
Wood or Coal	43%	40%	47%	34%	69%	44%	55%	--
Other	14%	14%	17%	8%	19%	24%	8%	--
Use of Additional Heating System[C]								
Always/Often	49%	42%	56%	39%	43%	58%	53%	--
Rarely/Sometimes	51%	58%	44%	61%	57%	42%	47%	--
Have No Thermostats[C]	5%	2%	5%	6%	7%	4%	2%	1.00
Have Programmable Thermostat(s)[C]	41%	29%	41%	43%	37%	36%	51%	1.00
Mean Number of Thermostats[D]								
Total	2.2	2.8	2.2	2.0	2.0	2.3	2.4	0.79
Programmable	1.0	1.00	0.9	1.0	0.7	0.8	1.2	0.73
Standard	1.3	1.8	1.3	1.0	1.3	1.5	1.2	0.84
Mean Thermostat Setting								
Early a.m. (6-9am)	64.4	62.9	64.5	64.6	63.6	63.9	64.9	--
Morning (9-1pm)	63.5	62.7	63.8	63.4	62.4	62.8	63.6	--
Afternoon (1-5pm)	63.7	62.9	64.0	63.6	63.0	63.0	64.1	--
Evening (5-7pm)	65.8	64.4	65.9	66.2	64.7	64.6	66.1	--
Night (7pm-6am)	63.0	61.5	63.1	63.2	61.6	62.7	62.9	--

[A] Of customers who pay to heat their home.

[B] Customers can have more than one additional heating system.

[C] Of customers who heat their residence.

[D] Of customers who have thermostats.

Table 8. Space Cooling – by Electric Energy Efficiency Program Administrator

	Total (n=2,667)	CLC (n=224)	NGRID (n=1,156)	NSTAR (n=830)	Unitil (n=133)	WMECO (n=204)	Munis (n=120)	Adj. Factor
Have Air Conditioning (Central or Room)	82%	75%	84%	82%	75%	68%	90%	0.99
Central Air Cooling								
Have CAC	36%	38%	34%	39%	24%	26%	42%	0.82
No CAC	64%	62%	66%	61%	76%	74%	58%	1.13
76-100% of Space Conditioned[A]	82%	90%	83%	82%	52%	83%	47%	1.03
CAC System Type[A]								
Central AC	89%	90%	89%	88%	81%	85%	93%	1.19
Heat Pump	8%	10%	7%	8%	--	8%	9%	0.44
Ductless Mini Split	4%	2%	3%	5%	<1%	6%	2%	--
Other	2%	2%	2%	3%	18%	<1%	--	--
Mean Number of CAC Systems[A]	1.2	1.2	1.2	1.3	1.4	1.1	1.3	0.99
Mean Age of Main CAC Unit[A]	7.7	6.4	7.8	7.6	8.7	7.7	8.1	--
Have No Thermostats[B]	8%	6%	7%	10%	31%	10%	2%	--
Have Programmable Thermostat(s)[B]	49%	32%	53%	47%	33%	57%	58%	1.20
Mean Number of Thermostats[C]								
Total	1.7	2.1	1.5	1.7	1.9	1.6	1.7	0.94
Programmable	1.0	1.0	1.0	1.0	0.6	1.2	1.2	1.00
Standard	0.6	1.1	0.5	0.7	1.3	0.4	0.5	0.87
Mean Thermostat Setting								
Early a.m. (6-9am)	72.2	73.2	72.1	72.0	71.2	72.4	72.4	--
Morning (9-1pm)	72.6	73.1	72.6	72.5	71.1	72.8	72.8	--
Afternoon (1-5pm)	72.5	72.9	72.4	72.4	70.1	72.6	72.8	--
Evening (5-7pm)	72.0	73.0	71.9	71.8	70.0	72.2	72.2	--
Night (7pm-6am)	72.1	73.3	72.1	71.8	71.3	72.4	72.2	--
Room AC								
Have Room AC	63%	55%	66%	59%	67%	57%	66%	--
No Room AC	37%	45%	34%	41%	33%	43%	34%	--
Mean Number of Room ACs[C]	2.0	1.9	2.1	2.0	2.0	1.7	2.2	--
Mean Age of Room ACs[C]	5.2	4.7	5.2	5.5	5.6	5.7	6.6	1.25
Mean Size of Room ACs (BTUs)[C]	7,679	7,324	7,982	7,957	7,302	8,341	7,936	0.93
Always/Often Use Cooling Systems[C]								
Early a.m. (6-9am)	26%	26%	26%	28%	23%	25%	23%	--
Morning (9-1pm)	25%	27%	27%	23%	26%	29%	24%	--
Afternoon (1-5pm)	31%	23%	20%	21%	35%	22%	23%	--
Evening (5-7pm)	37%	23%	18%	18%	26%	19%	24%	--
Night (7pm-6am)	37%	33%	38%	37%	35%	41%	32%	--

	Total (n=2,667)	CLC (n=224)	NGRID (n=1,156)	NSTAR (n=830)	Unitil (n=133)	WMECO (n=204)	Munis (n=120)	Adj. Factor
CAC: Very/Somewhat likely to								
Install[D]	14%	21%	15%	13%	20%	12%	11%	--
Replace[C]	29%	25%	35%	21%	42%	38%	30%	--
Room AC: Very/ Somewhat likely to								
Install[D]	15%	9%	16%	18%	33%	13%	8%	--
Replace[C]	41%	49%	42%	39%	53%	36%	43%	--

[A] Of customers who pay to cool their home.

[B] Of customers who have central cooling system.

[C] Of customers who have appliance/equipment.

[D] Of customers who do not have appliance/equipment.

Table 9. Water Heating – by Electric Energy Efficiency Program Administrator

	Total (n=2,667)	CLC (n=224)	NGRID (n=1,156)	NSTAR (n=830)	Unitil (n=133)	WMECO (n=204)	Munis (n=120)	Adj. Factor
Water Heating								
Pay for Hot Water	85%	95%	85%	80%	89%	90%	93%	1.04
Part of Rent	13%	2%	12%	19%	6%	6%	3%	--
No Hot Water	2%	3%	3%	1%	4%	4%	3%	--
Primary Water Heater Type[A]								
Natural Gas	52%	54%	45%	63%	51%	42%	53%	1.14
Electric	18%	22%	21%	14%	19%	22%	8%	0.89
Oil	26%	17%	30%	20%	28%	27%	36%	0.94
Bottled Gas	4%	5%	4%	2%	0%	9%	3%	0.94
Solar	<1%	1%	<1%	0%	0%	<1%	0%	--
Other	<1%	0%	<1%	1%	2%	0%	0%	--
Mean age of primary water heating system[A]	7.8	7.9	7.9	7.5	7.6	7.7	8.3	--
Primary water heater has insulation blanket/tank wrap[A]	25%	21%	25%	24%	27%	29%	29%	--
Uses Additional Heating System	3%	2%	4%	3%	5%	5%	1%	0.38
Low-Flow shower-heads installed in some/all showers	67%	65%	66%	67%	64%	62%	71%	0.95
Aerators on some/all faucets	51%	50%	53%	46%	52%	55%	55%	1.18

[A] Of customers who pay for hot water in their home.

Table 10. Building Shell – by Electric Energy Efficiency Program Administrator

	Total (n=2,667)	CLC (n=224)	NGRID (n=1,156)	NSTAR (n=830)	Unitil (n=133)	WMECO (n=204)	Munis (n=120)	Adj. Factor
All Exterior Walls Have Insulation	75%	86%	78%	68%	80%	71%	76%	--
Attic/Ceiling Has Insulation	89%	92%	90%	85%	94%	90%	93%	--
Rating of Attic/ Ceiling Insulation								
0-3 in. (<R-10)	13%	16%	13%	15%	6%	7%	10%	0.40
4-6 in. (R-11-19)	54%	55%	55%	51%	56%	54%	60%	1.26
7-10 in. (R-20-30)	24%	24%	24%	26%	24%	24%	19%	1.01
> 10 in. (R-31+)	9%	4%	8%	8%	15%	15%	10%	0.80
Window Type by Pane (All/Most)								
Single w/ Storm	23%	18%	20%	26%	26%	28%	30%	0.74
Single, no Storm	8%	7%	7%	10%	5%	5%	6%	0.14
Double	57%	58%	59%	53%	59%	57%	56%	1.36
Single/Double	9%	11%	10%	9%	6%	8%	9%	0.67
Triple Pane	3%	6%	4%	2%	5%	2%	3%	0.16
Window Frames (All/Most)								
Vinyl	43%	41%	47%	39%	51%	39%	43%	1.04
Wood	32%	34%	30%	34%	29%	35%	33%	1.05
Wood and Vinyl	17%	20%	16%	16%	16%	20%	22%	0.34
Metal	7%	5%	7%	10%	3%	6%	3%	1.47

Table 11. Laundry Equipment – by Electric Energy Efficiency Program Administrator

	Total (n=2,667)	CLC (n=224)	NGRID (n=1,156)	NSTAR (n=830)	Unitil (n=133)	WMECO (n=204)	Munis (n=120)	Adj. Factor
Laundry Equipment								
Private Use	88%	96%	90%	82%	93%	88%	97%	0.96
Common Area Use	8%	2%	7%	13%	2%	8%	3%	1.29
No Use in Building	4%	2%	3%	5%	5%	4%	1%	1.00
Clothes Washer Type[A]								
Top Loading	75%	74%	77%	73%	79%	75%	68%	0.98
Front Loading	25%	26%	23%	27%	21%	25%	32%	1.06
Mean Age of Clothes Washer[A]	6.9	6.9	6.9	6.7	7.1	7.3	7.4	--
Mean Number of Loads per Week[A]								
Total	5.1	4.6	5.2	5	4.9	5	5.8	--
Hot Water	0.7	0.8	0.6	0.8	0.5	0.8	0.8	--
Warm Water	2.1	2.0	2.1	2.1	1.8	2.1	2.3	--
Cold Water	2.3	1.8	2.4	2.1	2.6	2.1	2.8	--
Weekday Use of Laundry Equip. [A]								
Summer (1-5 p.m.)								
Freq./Occasional	71%	74%	73%	67%	68%	74%	75%	--
Rarely/Never	29%	26%	27%	33%	32%	26%	25%	--
Winter (5-7 p.m.)								
Freq./Occasional	69%	54%	72%	67%	58%	73%	67%	--
Rarely/Never	31%	46%	28%	33%	42%	27%	33%	--
Clothes Dryer	86%	94%	88%	80%	90%	85%	92%	0.97
Clothes Dryer Type[B]								
Natural Gas	24%	19%	20%	33%	22%	16%	21%	0.75
Electric	74%	77%	77%	66%	77%	81%	77%	1.11
Bottled Gas	2%	5%	3%	1%	2%	3%	2%	--
Mean Age of Clothes Dryer	7.5	7.7	7.3	7.4	7.7	8.5	7.5	--
Mean % Laundry Loads Line Dried[B]								
Summer	18%	20%	16%	16%	20%	32%	18%	--
Spring/Fall	14%	16%	13%	13%	15%	26%	16%	--
Winter	10%	9%	9%	11%	12%	16%	9%	--

[A] Of customers who have private use of laundry equipment.

[B] Of customers who have a clothes dryer.

Table 12. Food Preparation – by Electric Energy Efficiency Program Administrator

	Total (n=2,667)	CLC (n=224)	NGRID (n=1,156)	NSTAR (n=830)	Unitil (n=133)	WMECO (n=204)	Munis (n=120)	Adj. Factor
Type of Stovetop/Range[A]								
Natural Gas	39%	35%	34%	54%	37%	20%	32%	0.95
Electric	56%	58%	61%	42%	56%	73%	64%	1.05
Bottled Gas	5%	6%	5%	4%	7%	7%	4%	0.79
Other	<1%	<1%	<1%	<1%	0%	1%	0%	--
Mean Age of Stovetop/Range	8.1	8.2	8.2	7.9	9.7	8.5	8.5	1.20
Microwave Oven	95%	97%	96%	94%	97%	94%	98%	1.00
George Foreman Type Indoor Grill	32%	29%	34%	31%	31%	30%	34%	--
Dishwasher	75%	86%	74%	76%	66%	66%	84%	0.94
Mean Dishwasher Loads per Week	3.2	3.3	3.2	3.1	2.7	2.7	3.9	--
Weekday Use of Dishwasher								
Summer (1-5 p.m.)								
Freq./Occasional	44%	63%	45%	39%	51%	45%	45%	--
Rarely/Never	56%	37%	55%	61%	49%	55%	55%	--
Winter (5-7 p.m.)								
Freq./Occasional	60%	60%	62%	56%	63%	54%	69%	--
Rarely/Never	40%	40%	38%	44%	37%	46%	31%	--
Mean Age of Dishwasher	7.3	8.0	7.3	7.0	7.4	8.0	6.7	--

[A] Of customers who have a stovetop/range.

Table 13. Refrigerators and Freezers – by Electric Energy Efficiency Program Administrator

	Total (n=2,667)	CLC (n=224)	NGRID (n=1,156)	NSTAR (n=830)	Unitil (n=133)	WMECO (n=204)	Munis (n=120)	Adj. Factor
Refrigerator	>99%	>99%	>99%	>99%	100%	99%	99%	1.00
2+ Refrigerators	26%	31%	26%	25%	23%	21%	37%	1.03
Mean Number of Refrigerators	1.3	1.3	1.3	1.3	1.3	1.2	1.4	1.00
Refrigerator Style								
Single-Door	13%	13%	13%	13%	10%	15%	9%	0.63
Two-Door	86%	87%	86%	85%	90%	85%	90%	1.05
Three or Four-Door	1%	<1%	1%	1%	--	1%	1%	0.88
Refrigerator Size								
Small (<15 cu. ft.)	14%	18%	15%	13%	17%	15%	17%	0.68
Med. (15-18 cu. ft.)	44%	41%	45%	43%	48%	52%	38%	0.46
Large (>18 cu. ft.)	42%	41%	41%	45%	35%	33%	45%	1.73
Defrost Capabilities								
Automatic (Frost-Free)	91%	93%	92%	89%	91%	90%	91%	1.06
Manual	9%	7%	8%	11%	9%	10%	9%	0.47
Mean Age of Refrigerator	7.9	7.4	7.7	8.0	7.8	8.3	8.5	--
Refrigerator Use								
Year-Round	94%	82%	95%	95%	97%	97%	96%	
Seasonally	6%	18%	5%	5%	3%	3%	4%	--
Stand-Alone Freezer	22%	22%	23%	17%	22%	32%	29%	0.59
Two or More Freezers	1%	1%	1%	1%	2%	3%	2%	0.97
Mean Number of Freezers	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.61
Freezer Style								
Frost-Free	48%	55%	48%	49%	44%	35%	64%	--
Manual Defrost	52%	45%	52%	51%	56%	65%	36%	--
Freezer Size								
Small (<15 cu. ft.)	41%	44%	45%	38%	31%	41%	24%	--
Med. (15-18 cu. ft.)	46%	49%	42%	50%	58%	47%	52%	--
Large (>18 cu. Ft.)	13%	7%	13%	12%	12%	12%	24%	--
Mean Age of Freezer	10.3	10.0	9.8	10.2	9.8	11.2	12.4	--
Freezer Use								
Year-Round	95%	92%	94%	98%	100%	91%	100%	--
Seasonally	5%	8%	6%	2%	--	9%	--	--

Table 14. Entertainment Equipment – by Electric Energy Efficiency Program Administrator

	Total (n=2,667)	CLC (n=224)	NGRID (n=1,156)	NSTAR (n=830)	Unitil (n=133)	WMECO (n=204)	Munis (n=120)	Adj. Factor
Television	99%	99%	99%	99%	100%	98%	99%	1.00
Mean Number of TVs[A]								
Total	2.4	2.6	2.5	2.3	2.5	2.3	2.8	1.15
Standard Tube (CRT)	1.7	2.0	1.8	1.6	1.9	1.7	1.8	1.16
Projection TV	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.36
Flat Panel LCD	0.6	0.5	0.6	0.6	0.5	0.5	0.7	1.38
Flat Panel Plasma	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.67
Mean Hours of Operation								
Primary TV								
Weekday	4.9	4.3	5.2	4.3	5.2	5.5	5.3	--
Weekend	5.8	4.9	6.1	5.3	6.1	6.4	6.4	--
Additional TVs								
Weekday	2.4	2.3	2.4	2.2	2.7	2.5	2.4	--
Weekend	3.0	2.6	2.9	3.0	3.5	3.6	2.9	--
Weekday Use of Primary TV								
Summer (1-5 p.m.)								
Freq./Occasional	59%	59%	63%	52%	74%	67%	64%	--
Rarely/Never	41%	41%	37%	48%	26%	33%	36%	--
Winter (5-7 p.m.)								
Freq./Occasional	85%	76%	87%	81%	95%	93%	89%	--
Rarely/Never	15%	24%	13%	19%	5%	7%	11%	--
Weekday Use of Additional TVs								
Summer (1-5 p.m.)								
Freq./Occasional	37%	43%	39%	33%	47%	42%	38%	--
Rarely/Never	62%	57%	61%	67%	53%	58%	62%	--
Winter (5-7 p.m.)								
Freq./Occasional	56%	46%	57%	57%	67%	62%	56%	--
Rarely/Never	43%	54%	43%	43%	33%	38%	44%	--
Households with Accessories:								
Home Theater	14%	9%	15%	13%	16%	16%	21%	1.39
D/A Converter Box	11%	5%	9%	14%	10%	14%	8%	0.20
Analog Cable Box	8%	7%	9%	9%	8%	6%	5%	1.10
Digital Cable Box	49%	37%	49%	52%	49%	39%	55%	1.25
Digital Cable Box+DVR	22%	10%	22%	24%	16%	10%	33%	0.58
Separate DVR	9%	7%	9%	11%	5%	6%	8%	0.62
Digital Satellite Box	9%	6%	11%	7%	13%	14%	3%	0.99
Video Game Player	26%	18%	27%	25%	31%	28%	25%	1.37
DVD Player, DVD/VCR	69%	66%	70%	67%	75%	69%	70%	1.19
VCR Only	32%	25%	33%	32%	41%	32%	29%	1.12
Stereo	48%	42%	48%	50%	51%	49%	47%	1.48

	Total (n=2,667)	CLC (n=224)	NGRID (n=1,156)	NSTAR (n=830)	Unitil (n=133)	WMECO (n=204)	Munis (n=120)	Adj. Factor
Equipment Always or Often Unplugged/Off at Power Strip:								
Primary TV	9%	13%	8%	10%	7%	7%	6%	--
Additional TVs	9%	11%	9%	10%	8%	9%	7%	--
Audio/TV accessories	10%	9%	10%	11%	5%	15%	5%	--
Other equipment	15%	17%	15%	15%	10%	17%	9%	--

[A] Of customers who have a TV.

Table 15. Home Office – by Electric Energy Efficiency Program Administrator

	Total (n=2,667)	CLC (n=224)	NGRID (n=1,156)	NSTAR (n=830)	Unitil (n=133)	WMECO (n=204)	Munis (n=120)	Adj. Factor
Work from Home	17%	20%	16%	20%	11%	14%	17%	--
Hours per Week Working at Home								
0-10 hrs	39%	37%	35%	46%	43%	34%	35%	--
11-30 hrs	39%	43%	41%	33%	43%	52%	45%	--
More than 30 hrs	22%	20%	24%	21%	15%	14%	20%	--
Computer	82%	69%	84%	84%	78%	74%	85%	1.00
Mean Number of Computers[A]								
Total	1.6	1.5	1.5	1.6	1.5	1.4	1.7	1.31
Flat panel monitor	1.2	1.2	1.2	1.4	1.1	1.1	1.4	1.36
CRT monitor	0.3	0.3	0.4	0.3	0.5	0.4	0.4	1.07
Computer Use								
On	30%	33%	32%	28%	31%	31%	25%	--
In sleep mode	22%	15%	21%	27%	14%	18%	20%	--
Off	47%	53%	47%	45%	55%	51%	55%	--
Households with:								
Telephone (Landline)	87%	89%	88%	82%	87%	88%	97%	0.99
Cell Phone	83%	80%	84%	86%	82%	73%	87%	--
Answering Machine	74%	75%	75%	68%	75%	74%	88%	1.07
Multifunction Device	42%	35%	44%	42%	39%	39%	47%	1.24
Fax Machine	10%	11%	10%	10%	9%	7%	18%	0.70
Printer	54%	49%	55%	55%	49%	53%	60%	0.68
Scanner	20%	18%	20%	19%	16%	25%	21%	0.42
Copier	17%	19%	16%	17%	18%	19%	22%	0.17
Home Network	24%	14%	23%	28%	21%	17%	24%	--

[A] Of customers who have a computer.

Table 16. Lighting – by Electric Energy Efficiency Program Administrator

	Total (n=2,667)	CLC (n=224)	NGRID (n=1,156)	NSTAR (n=830)	Unitil (n=133)	WMECO (n=204)	Munis (n=120)	Adj. Factor
Incandescents								
None	6%	3%	6%	6%	5%	9%	5%	0.42
1-2	13%	12%	14%	12%	13%	15%	7%	0.10
3-5	22%	18%	22%	23%	31%	20%	19%	0.17
6-10	27%	30%	28%	26%	27%	24%	21%	0.28
11 or more	33%	37%	30%	33%	24%	32%	47%	2.45
CFLs								
None	14%	15%	15%	14%	18%	15%	13%	2.10
1-2	18%	16%	17%	21%	10%	13%	14%	1.05
3-5	26%	30%	25%	27%	23%	25%	26%	0.52
6-10	23%	20%	24%	22%	30%	24%	25%	1.02
11 or more	18%	19%	19%	16%	20%	23%	23%	1.12
Halogen Torchieres								
None	74%	76%	75%	70%	74%	81%	79%	1.20
1-2	20%	20%	19%	23%	24%	16%	16%	0.44
3-5	4%	3%	5%	5%	3%	1%	3%	0.22
6-10	1%	1%	1%	1%	--	--	--	1.31
11 or more	1%	--	<1%	1%	--	1%	3%	--
Fluorescent Torchieres								
None	83%	84%	83%	82%	82%	83%	82%	1.16
1-2	14%	12%	13%	14%	15%	17%	14%	0.35
3-5	3%	4%	3%	3%	3%	--	1%	1.31
6-10	1%	--	1%	<1%	--	<1%	3%	--
11 or more	<1%	<1%	<1%	1%	0%	0%	0%	--
Fluorescent Tube Lights								
None	36%	33%	35%	40%	32%	35%	25%	1.02
1-2	33%	30%	34%	32%	35%	34%	37%	0.58
3-5	21%	27%	20%	19%	24%	20%	24%	0.69
6-10	8%	8%	7%	8%	6%	10%	9%	2.39
11 or more	3%	2%	3%	1%	4%	1%	6%	2.28

Table 17. Miscellaneous Appliances – by Electric Energy Efficiency Program Administrator

	Total (n=2,667)	CLC (n=224)	NGRID (n=1,156)	NSTAR (n=830)	Unitil (n=133)	WMECO (n=204)	Munis (n=120)	Adj. Factor
Households with:								
Portable Fan	69%	62%	70%	69%	77%	72%	68%	--
Ceiling Fan	60%	56%	66%	48%	64%	64%	68%	1.02
Attic/Whole-house Fan	10%	6%	10%	10%	12%	8%	17%	0.78
Electronic Household Air Cleaner	9%	9%	10%	9%	8%	8%	14%	--
Humidifier	26%	19%	27%	24%	32%	25%	31%	1.24
Dehumidifier	46%	72%	48%	37%	49%	44%	57%	1.10
Heated Waterbed	2%	2%	2%	2%	<1%	1%	3%	0.97
Sauna - electric	1%	<1%	<1%	1%	1%	<1%	2%	0.97
Electric Whirlpool/Spa	5%	8%	5%	5%	9%	7%	5%	1.46
Electric Water Heater for Pool	1%	1%	2%	1%	<1%	1%	2%	2.92
Pond/Well/Pool Pump	16%	19%	18%	8%	34%	21%	23%	1.45
Cordless Vacuum	16%	16%	16%	16%	13%	17%	19%	--
Battery Charger for Appliances	50%	42%	53%	46%	50%	53%	60%	--
Home Security System	19%	19%	18%	20%	24%	17%	21%	0.97
Elect. Exercise Equip.	18%	11%	19%	15%	9%	19%	23%	1.12
Electric Clocks/Clock Radios	82%	82%	82%	80%	92%	83%	81%	--
Mean Hours/Day for Dehumidifier								
Summer	7.8	9.2	7.4	8.0	7.3	8.0	7.5	--
Spring/Fall	4.3	4.3	4.4	4.7	4.5	3.3	3.8	--
Winter	2.3	1.3	2.5	2.7	3.2	1.9	1.9	--
Mean Hours/Day for Pool Pumps								
Summer	6.3	5.5	6.5	6.1	5.1	4.9	6.9	--
Spring/Fall	2.3	2.7	1.8	3.9	0.1	1.4	3.1	--
Winter	0.7	0.0	0.7	1.6	0.0	0.1	0.7	--

Table 18. Energy Efficiency – by Electric Energy Efficiency Program Administrator

	Total (n=2,667)	CLC (n=224)	NGRID (n=1,156)	NSTAR (n=830)	Unitil (n=133)	WMECO (n=204)	Munis (n=120)	Adj. Factor
ENERGY STAR® Label Familiar (very/somewhat)	80%	79%	80%	80%	73%	83%	78%	--
Influenced Purchase Decision[A]	66%	69%	65%	66%	60%	67%	70%	--
Meaning of ENERGY STAR® Label[A]								
Government Endorsement	2%	1%	2%	2%	4%	2%	0%	--
Tested/Meets Standards	14%	17%	11%	16%	14%	16%	18%	--
High Quality	2%	3%	2%	1%	3%	2%	0%	--
Less Pollution/Good for Environment	3%	<1%	3%	4%	2%	2%	1%	--
Uses Less Energy	76%	74%	78%	74%	73%	71%	79%	--
Lower Utility Bills	4%	4%	4%	3%	4%	6%	2%	--
ENERGYGuide Label Familiar (very/somewhat)	76%	79%	76%	72%	75%	81%	81%	--
Information on ENERGYGuide Label[B]								
Government Endorsement	5%	5%	5%	6%	9%	5%	4%	--
Product is Tested/Meets Standards	23%	23%	23%	23%	25%	20%	26%	--
High Quality	6%	5%	7%	6%	7%	5%	5%	--
Appliance Uses Less Energy	29%	28%	32%	28%	47%	25%	27%	--
How Much Energy the Appliance Uses	58%	51%	57%	61%	54%	59%	61%	--
Compares Energy Use to Similar Models	36%	33%	36%	35%	40%	39%	38%	--
Lower Utility Bills	19%	18%	20%	17%	27%	18%	20%	--
Estimated Yearly Operating Cost	41%	39%	43%	38%	44%	46%	39%	--
Familiarity (very/somewhat) with Programs								
Rebate Program	32%	36%	31%	33%	15%	28%	35%	--
Home Energy Audit	37%	43%	36%	36%	30%	45%	32%	--
ENERGY STAR® Homes	18%	23%	18%	17%	15%	21%	18%	--
Home Performance with ENERGY STAR®	13%	16%	13%	12%	15%	16%	15%	--

	Total (n=2,667)	CLC (n=224)	NGRID (n=1,156)	NSTAR (n=830)	Unitil (n=133)	WMECO (n=204)	Munis (n=120)	Adj. Factor
Products that Should Receive Rebates								
Light Bulbs/Fixtures	39%	36%	43%	37%	43%	37%	33%	--
Clothes Washers	35%	33%	37%	33%	32%	39%	30%	--
Refrig./Freezers	53%	62%	53%	52%	51%	58%	47%	--
Dishwashers	16%	21%	16%	17%	12%	8%	17%	--
Room Air Cond.	16%	7%	17%	17%	14%	14%	12%	--
Central Cool. Systems	26%	28%	24%	28%	16%	20%	33%	--
Heating Systems	65%	74%	63%	67%	67%	64%	65%	--
Windows	60%	58%	61%	58%	71%	58%	63%	--
Insulation	42%	39%	41%	43%	40%	42%	54%	--
Solar DWH	20%	22%	21%	20%	31%	19%	19%	--
Pool Pumps	1%	1%	1%	1%	2%	4%	1%	--
Geotherm Heat Pump	10%	7%	9%	10%	8%	15%	11%	--
Interest in Services and Products								
Green Power	67%	63%	64%	72%	66%	65%	63%	--
Rebate Programs	76%	74%	78%	79%	76%	75%	76%	--
Home Energy Audits	56%	60%	55%	58%	54%	56%	50%	--

[A] Of customers who have seen the ENERGY STAR® label before.

[B] Of customers who have seen the ENERGYGuide label before.

Table 19. Profile of Respondents – by Electric Energy Efficiency Program Administrator

	Total (n=2,667)	CLC (n=224)	NGRID (n=1,156)	NSTAR (n=830)	Unitil (n=133)	WMECO (n=204)	Munis (n=120)	Adj. Factor
Mean Age of Head-of-Household	51.6	55.6	51.8	50.1	51.8	51.1	54	--
Education Level								
High School Graduate or Less	19%	11%	24%	13%	28%	27%	21%	--
College Graduate/ Some College	51%	49%	52%	50%	55%	53%	47%	--
Postgraduate Degree	30%	40%	24%	37%	17%	20%	33%	--
Mean Household Income	77,033	83,816	74,389	82,664	65,931	59,242	86,303	--
Mean Time Lived in Home	11.7	11.7	11.7	11	12.7	12.4	14.4	--
Mean Number of Occupants	2.6	2.5	2.6	2.6	2.7	2.4	2.9	--
Primary Language not English	5%	1%	5%	7%	5%	10%	1%	--

DATA SUMMARY BY BUILDING TYPE

The following tables summarize responses to the mail/Internet survey for all Massachusetts customers ("Total" column) and by type of building the customer lives in. The building type of a customer's residence is based on Question A1 of the survey ("What type of building exists at the service address listed on the front cover of this survey?"). Building types are grouped as follows:

- Single-family: (1) Single-family detached house
- 2-4 units: (2) Townhouse, duplex, or row house; (3) Apartment or condominium (2–4 units)
- 5+ units: (4) Apartment or condominium (5 or more units)
- Other: (5) Mobile home or trailer; (00) Other

The final column presents the adjustment factor developed through the in-home verification visits. For explanations of the development and use of adjustment factors, please refer to the Methodology section.

The number of responses for each building type ("n" in the table headers) represents the total number of surveys completed. It should be noted that not every respondent answered every question; therefore the number of responses for any one question might be smaller than the number presented in the table header. Volume 2 of this report presents more detail about the number of responses for each question as well as significant differences between comparison groups.

Table 20. Home Characteristics – by Building Type

	Total (n=2,667)	Single-Family (n=1,720)	Multi 2-4 Units (n=546)	Multi 5+ Units (n=357)	Other (n=25)	Adj. Factor
Mean No. of People per HH	2.6	2.8	2.4	1.8	1.7	----
Building Type						
SF Detached	67%	100%	0%	0%	0%	0.99
MF (2-4 units)	20%	0%	100%	0%	0%	0.87
MF (5+ units)	12%	0%	0%	100%	0%	1.18
Other	1%	0%	0%	0%	100%	0.50
Own Home	81%	97%	52%	42%	79%	--
Year-Round Occupancy	93%	93%	95%	93%	79%	--
Mean No. of Rooms[A]	6.4	7.1	5.6	3.5	4.9	1.05
Mean Dwelling Size (sq. ft)	1,866	2,096	1,541	1,104	987	--
Home Built						
Before 1930	26%	21%	47%	25%	13%	--
1930-1969	36%	42%	23%	22%	24%	--
1970-1999	30%	30%	23%	39%	63%	--
2000 or later	8%	7%	7%	14%	--	--
Home Remodeled in Last 3 Yrs	25%	27%	23%	16%	25%	--
Natural Gas Service Available	54%	50%	73%	45%	30%	1.14

[A] Excludes bathrooms, halls, pantries, unheated rooms, and garages.

Table 21. Space Heating – by Building Type

	Total (n=2,667)	Single-Family (n=1,720)	Multi 2-4 Units (n=546)	Multi 5+ Units (n=357)	Other (n=25)	Adj. Factor
Mean No. of People per HH	2.6	2.8	2.4	1.8	1.7	----
Home Heating						
Pay to Heat Home	92%	99%	92%	54%	96%	0.98
Heat Part of Rent	7%	<1%	8%	44%	--	--
No Heat	1%	1	--	2%	4%	--
Primary Heating System Type[A]						
Natural Gas	49%	45%	66%	51%	38%	1.06
Electric	8%	4%	10%	46%	14%	0.99
Oil	39%	46%	23%	2%	42%	0.94
Bottled Gas	2%	3%	1%	1%	5%	0.66
Wood or Coal	1%	1%	<1%	--	1%	--
Other	1%	1%	<1%	--	0%	0.50
Mean Age of Primary Heating System[A]	12.3	12.5	11.4	12.2	12.4	--
Uses Additional Heating System	32%	35%	25%	15%	31%	0.87
Additional Heating System Type[AB]						
Natural Gas	2%	2%	4%	--	---	--
Electric	46%	40%	70%	91%	15%	--
Oil	6%	5%	7%	5%	--	--
Bottled Gas	10%	9%	11%	6%	66%	--
Wood or Coal	43%	50%	20%	13%	15%	--
Other	14%	16%	7%	5%	5%	--
Use of Additional Heating System[C]						
Always/Often	49%	52%	49%	25%	42%	--
Rarely/Sometimes	51%	48%	51%	75%	58%	--
Have No Thermostats[C]	5%	3%	5%	19%	1%	1.00
Have Programmable Thermostat(s)[C]	41%	45%	37%	26%	22%	1.00
Mean Number of Thermostats[D]						
Total	2.2	2.2	2.4	1.7	1.7	0.79
Programmable	0.95	1.0	1.1	0.7	0.5	0.73
Standard	1.25	1.3	1.3	1.0	1.2	0.84
Mean Thermostat Setting						
Early a.m. (6-9am)	64.4	64.2	64.5	65.3	64.5	--
Morning (9-1pm)	63.5	63.3	63.5	65.0	65.6	--
Afternoon (1-5pm)	63.7	63.5	63.7	65.1	66.1	--
Evening (5-7pm)	65.8	65.5	65.9	66.7	66.0	--
Night (7pm-6am)	63.0	62.5	63.8	64.6	62.8	--

[A] Of customers who pay to heat their home.
[B] Customers can have more than one additional heating system.
[C] Of customers who heat their residence.
[D] Of customers who have thermostats.

Table 22. Space Cooling – by Building Type

	Total (n=2,667)	Single-Family (n=1,720)	Multi 2-4 Units (n=546)	Multi 5+ Units (n=357)	Other (n=25)	Adj. Factor
Mean No. of People per HH	2.6	2.8	2.4	1.8	1.7	----
Have Air Conditioning (Central or Room)	82%	82%	75%	92%	89%	0.99
Central Air Cooling						
Have CAC	36%	35%	26%	54%	42%	0.82
No CAC	64%	65%	74%	46%	58%	1.13
76-100% of Space Conditioned[A]	82%	82%	82%	86%	69%	1.03
CAC System Type[A]						
Central AC	89%	93%	85%	73%	100%	1.19
Heat Pump	8%	4%	11%	24%	--	0.44
Ductless Mini Split	4%	3%	4%	4%	--	--
Other	2%	2%	4%	3%	--	--
Mean Number of CAC Systems[A]	1.2	1.3	1.2	1.1	1.4	0.99
Mean Age of Main CAC Unit[A]	7.7	7.6	7.1	8.6	10.0	--
Have No Thermostats[B]	8%	5%	10%	19%	--	--
Have Programmable Thermostat(s)[B]	49%	56%	45%	30%	27%	1.20
Mean Number of Thermostats[C]						
Total	1.7	1.8	1.3	1.3	1.5	0.94
Programmable	1.0	1.2	0.8	0.5	0.0	1.00
Standard	0.6	0.6	0.5	0.8	1.5	0.87
Mean Thermostat Setting						
Early a.m. (6-9am)	72.2	72.4	72.3	71.3	72.4	--
Morning (9-1pm)	72.6	72.8	72.9	71.6	72.6	--
Afternoon (1-5pm)	72.5	72.7	72.5	71.5	71.6	--
Evening (5-7pm)	72.0	72.2	71.9	71.2	71.6	--
Night (7pm-6am)	72.1	72.3	72.4	71.2	70.3	--
Room AC						
Have Room AC	63%	60%	62%	75%	74%	--
No Room AC	37%	40%	38%	25%	26%	--
Mean Number of Room ACs[C]	2.0	2.2	1.9	1.4	1.8	--
Mean Age of Room ACs[C]	5.2	5.3	4.7	7.0	7.3	1.25
Mean Size of Room ACs (BTUs)[C]	7,679	8,055	7,698	7,920	7,373	0.93
Always/Often Use Cooling Systems[C]						
Early a.m. (6-9am)	26%	27%	24%	29%	--	--
Morning (9-1pm)	25%	26%	23%	26%	27%	--
Afternoon (1-5pm)	31%	19%	24%	22%	30%	--
Evening (5-7pm)	37%	18%	19%	17%	36%	--
Night (7pm-6am)	37%	38%	34%	42%	--	--

	Total (n=2,667)	Single-Family (n=1,720)	Multi 2-4 Units (n=546)	Multi 5+ Units (n=357)	Other (n=25)	Adj. Factor
CAC: Very/Somewhat likely to						
Install[D]	14%	15%	14%	3%	--	--
Replace[C]	29%	29%	24%	28%	54%	--
Room AC: Very/ Somewhat likely to						
Install[D]	15%	9%	26%	36%	--	--
Replace[C]	41%	42%	36%	41%	66%	--

[A] Of customers who pay to cool their home.

[B] Of customers who have central cooling system.

[C] Of customers who have appliance/equipment.

[D] Of customers who do not have appliance/equipment.

Table 23. Water Heating – by Building Type

	Total (n=2,667)	Single-Family (n=1,720)	Multi 2-4 Units (n=546)	Multi 5+ Units (n=357)	Other (n=25)	Adj. Factor
Mean No. of People per HH	2.6	2.8	2.4	1.8	1.7	----
Water Heating						
Pay for Hot Water	85%	96%	78%	31%	88%	1.04
Part of Rent	13%	1%	20%	68%	12%	--
No Hot Water	2%	3%	2%	1%	--	--
Primary Water Heater Type[A]						
Natural Gas	52%	48%	72%	43%	15%	1.14
Electric	18%	16%	16%	53%	79%	0.89
Oil	26%	32%	11%	4%	5%	0.94
Bottled Gas	4%	4%	1%	--	1%	0.94
Solar	<1%	<1%	--	--	--	--
Other	<1%	<1%	<1%	--	--	--
Mean age of primary water heating system[A]	7.8	8.0	7.0	6.4	7.6	--
Primary water heater has insulation blanket/tank wrap[A]	25%	26%	26%	25%	2%	--
Uses Additional Heating System	3%	3%	4%	1%	6%	0.38
Low-Flow shower-heads installed in some/all showers	67%	68%	66%	56%	57%	0.95
Aerators on some/all faucets	51%	53%	48%	43%	24%	1.18

[A] Of customers who pay for hot water in their home.

Table 24. Building Shell – by Building Type

	Total (n=2,667)	Single-Family (n=1,720)	Multi 2-4 Units (n=546)	Multi 5+ Units (n=357)	Other (n=25)	Adj. Factor
Mean No. of People per HH	2.6	2.8	2.4	1.8	1.7	----
All Exterior Walls Have Insulation	75%	78%	64%	72%	38%	--
Attic/Ceiling Has Insulation	89%	93%	79%	60%	66%	--
Rating of Attic/ Ceiling Insulation						
0-3 in. (<R-10)	13%	12%	20%	12%	60%	0.40
4-6 in. (R-11-19)	54%	54%	56%	53%	40%	1.26
7-10 in. (R-20-30)	24%	25%	17%	35%	0%	1.01
> 10 in. (R-31+)	9%	9%	7%	0%	0%	0.80
Window Type by Pane (All/Most)						
Single w/ Storm	23%	22%	24%	21%	54%	0.74
Single, no Storm	8%	5%	11%	18%	7%	0.14
Double	57%	58%	55%	54%	29%	1.36
Single/Double	9%	11%	8%	5%	10%	0.67
Triple Pane	3%	4%	2%	1%	0%	0.16
Window Frames (All/Most)						
Vinyl	43%	44%	47%	35%	50%	1.04
Wood	32%	34%	31%	23%	13%	1.05
Wood and Vinyl	17%	19%	15%	8%	0%	0.34
Metal	7%	3%	8%	34%	37%	1.47

Table 25. Laundry Equipment – by Building Type

	Total (n=2,667)	Single-Family (n=1,720)	Multi 2-4 Units (n=546)	Multi 5+ Units (n=357)	Other (n=25)	Adj. Factor
Mean No. of People per HH	2.6	2.8	2.4	1.8	1.7	----
Laundry Equipment						
Private Use	88%	98%	82%	43%	74%	0.96
Common Area Use	8%	1%	9%	50%	9%	1.29
No Use in Building	4%	1%	9%	7%	18%	1.00
Clothes Washer Type[A]						
Top Loading	75%	74%	78%	70%	92%	0.98
Front Loading	25%	26%	22%	30%	8%	1.06
Mean Age of Clothes Washer[A]	6.9	7.1	6.5	5.5	9.0	--
Mean Number of Loads per Week[A]						
Total	5.1	5.3	4.6	4.3	3.5	--
Hot Water	0.7	0.7	0.7	0.9	0.3	--
Warm Water	2.1	2.2	1.8	1.7	1.5	--
Cold Water	2.3	2.3	2.2	1.7	1.7	--
Weekday Use of Laundry Equip. [A]						
Summer (1-5 p.m.)						
Freq./Occasional	71%	72%	70%	70%	72%	--
Rarely/Never	29%	28%	30%	30%	28%	--
Winter (5-7 p.m.)						
Freq./Occasional	69%	69%	69%	66%	75%	--
Rarely/Never	31%	31%	31%	34%	25%	--
Clothes Dryer	86%	96%	77%	41%	74%	0.97
Clothes Dryer Type[B]						
Natural Gas	24%	24%	25%	15%	13%	0.75
Electric	74%	73%	74%	85%	87%	1.11
Bottled Gas	2%	3%	1%	0%	0%	--
Mean Age of Clothes Dryer	7.5	7.7	6.8	5.9	9.3	--
Mean % Laundry Loads Line Dried[B]						
Summer	18%	18%	19%	14%	20%	--
Spring/Fall	14%	14%	16%	12%	18%	--
Winter	10%	10%	12%	10%	14%	--

[A] Of customers who have private use of laundry equipment.

[B] Of customers who have a clothes dryer.

Table 26. Food Preparation – by Building Type

	Total (n=2,667)	Single-Family (n=1,720)	Multi 2-4 Units (n=546)	Multi 5+ Units (n=357)	Other (n=25)	Adj. Factor
Mean No. of People per HH	2.6	2.8	2.4	1.8	1.7	----
Type of Stovetop/Range[A]						
Natural Gas	39%	35%	57%	32%	25%	0.95
Electric	56%	58%	42%	67%	61%	1.05
Bottled Gas	5%	7%	2%	<1%	14%	0.79
Other	<1%	<1%	0%	<1%	0%	--
Mean Age of Stovetop/Range	8.1	8.4	7.7	7.4	11.4	1.20
Microwave Oven	95%	97%	93%	90%	93%	1.00
George Foreman Type Indoor Grill	32%	32%	30%	37%	23%	--
Dishwasher	75%	82%	58%	69%	43%	0.94
Mean Dishwasher Loads per Week	3.2	3.5	2.6	2.3	2.4	--
Weekday Use of Dishwasher						
Summer (1-5 p.m.)						
Freq./Occasional	44%	45%	45%	39%	49%	--
Rarely/Never	56%	55%	55%	61%	51%	--
Winter (5-7 p.m.)						
Freq./Occasional	60%	62%	53%	51%	39%	--
Rarely/Never	40%	38%	47%	49%	61%	--
Mean Age of Dishwasher	7.3	7.3	7.3	6.7	10.9	--

[A] Of customers who have a stovetop/range.

Table 27. Refrigerators and Freezers – by Building Type

	Total (n=2,667)	Single-Family (n=2,092)	Multi 2-4 Units (n=577)	Multi 5+ Units (n=312)	Other (n=23)	Adj. Factor
Mean No. of People per HH	2.6	2.8	2.4	1.8	1.7	----
Refrigerator	>99%	100%	99%	100%	100%	1.00
Two or More Refrigerators	26%	34%	16%	4%	7%	1.03
Mean Number of Refrigerators	1.3	1.4	1.2	1.0	1.1	1.00
Refrigerator Style						
Single-Door	13%	13%	14%	13%	7%	0.63
Two-Door	86%	86%	86%	86%	93%	1.05
Three or Four-Door	1%	1%	1%	<1%	0%	0.88
Refrigerator Size						
Small (under 14 cu. ft.)	14%	14%	15%	19%	16%	0.68
Medium (15-18 cu. ft.)	44%	40%	52%	53%	64%	0.46
Large (more than 19 cu. ft.)	42%	46%	33%	28%	20%	1.73
Defrost Capabilities						
Automatic (Frost-Free)	91%	92%	88%	88%	96%	1.06
Manual	9%	8%	12%	12%	4%	0.47
Mean Age of Refrigerator	7.9	8.2	7.2	6.7	6.6	--
Refrigerator Use						
Year-Round	94%	93%	97%	99%	95%	
Seasonally	6%	7%	3%	1%	5%	--
Stand-Alone Freezer	22%	28%	13%	6%	14%	0.59
Two or More Freezers	1%	1%	1%	0%	0%	0.97
Mean Number of Freezers	0.2	0.3	0.1	0.1	0.1	0.61
Freezer Style						
Frost-Free	48%	47%	54%	69%	38%	--
Manual Defrost	52%	53%	46%	31%	62%	--
Freezer Size						
Small (under 15 cu. Ft.)	41%	40%	47%	48%	89%	--
Medium (15-18 cu. Ft.)	46%	46%	46%	42%	11%	--
Large (over 18 cu. Ft)	13%	14%	7%	10%	0%	--
Mean Age of Freezer	10.3	10.8	6.6	11.5	2.8	--
Freezer Use						
Year-Round	95%	95%	93%	74%	100%	--
Seasonally	5%	5%	7%	26%	0%	--

Table 28. Entertainment Equipment – by Building Type

	Total (n=2,667)	Single-Family (n=1,720)	Multi 2-4 Units (n=546)	Multi 5+ Units (n=357)	Other (n=25)	Adj. Factor
Mean No. of People per HH	2.6	2.8	2.4	1.8	1.7	----
Television	99%	99%	98%	98%	95%	1.00
Mean Number of TVs[A]						
Total	2.4	2.6	2.2	1.8	1.6	1.15
Standard Tube (CRT)	1.7	1.8	1.6	1.2	1.5	1.16
Projection TV	0.1	0.1	<0.1	<0.1	<0.1	0.36
Flat Panel LCD	0.6	0.6	0.5	0.5	0.1	1.38
Flat Panel Plasma	0.1	0.1	0.1	<0.1	<0.1	0.67
Mean Hours of Operation						
Primary TV						
Weekday	4.9	4.8	5.0	4.9	5.9	--
Weekend	5.8	5.8	5.9	5.9	5.8	--
Additional TVs						
Weekday	2.4	2.3	2.6	2.3	1.5	--
Weekend	3.0	2.9	3.1	3.0	2.0	--
Weekday Use of Primary TV						
Summer (1-5 p.m.)						
Freq./Occasional	59%	59%	61%	59%	74%	--
Rarely/Never	41%	41%	39%	41%	26%	--
Winter (5-7 p.m.)						
Freq./Occasional	85%	85%	85%	85%	78%	--
Rarely/Never	15%	15%	15%	15%	22%	--
Weekday Use of Additional TVs						
Summer (1-5 p.m.)						
Freq./Occasional	37%	36%	42%	39%	61%	--
Rarely/Never	62%	64%	58%	61%	39%	--
Winter (5-7 p.m.)						
Freq./Occasional	56%	56%	61%	55%	58%	--
Rarely/Never	43%	44%	39%	45%	42%	--
Households with Accessories:						
Home Theater	14%	16%	11%	11%	--	1.39
D/A Converter Box	11%	10%	14%	9%	8%	0.20
Analog Cable Box	8%	8%	6%	11%	20%	1.10
Digital Cable Box	49%	51%	47%	43%	16%	1.25
Digital Cable Box+DVR	22%	25%	16%	16%	6%	0.58
Separate DVR	9%	10%	7%	7%	6%	0.62
Digital Satellite Box	9%	10%	9%	2%	8%	0.99
Video Game Player	26%	27%	25%	19%	6%	1.37
DVD Player, DVD/VCR	69%	71%	69%	61%	33%	1.19
VCR Only	32%	33%	30%	25%	19%	1.12
Stereo	48%	50%	47%	41%	7%	1.48

	Total (n=2,667)	Single-Family (n=1,720)	Multi 2-4 Units (n=546)	Multi 5+ Units (n=357)	Other (n=25)	Adj. Factor
Equipment Always or Often Unplugged/Off at Power Strip:						
Primary TV	9%	7%	13%	12%	8%	--
Additional TVs	9%	7%	15%	15%	--	--
Audio/TV accessories	10%	8%	16%	14%	--	--
Other equipment	15%	13%	20%	16%	--	--

[A] Of customers who have a TV.

Table 29. Home Office – by Building Type

	Total (n=2,667)	Single-Family (n=1,720)	Multi 2-4 Units (n=546)	Multi 5+ Units (n=357)	Other (n=25)	Adj. Factor
Mean No. of People per HH	2.6	2.8	2.4	1.8	1.7	----
Work from Home	17%	19%	15%	15%	5%	--
Hours per Week Working at Home						
0-10 hrs	39%	40%	36%	41%	--	--
11-30 hrs	39%	39%	41%	36%	100%	--
More than 30 hrs	22%	21%	23%	23%	--	--
Computer	82%	84%	80%	76%	36%	1.00
Mean Number of Computers[A]						
Total	1.6	1.7	1.5	1.4	1.0	1.31
Flat panel monitor	1.2	1.3	1.1	1.1	0.6	1.36
CRT monitor	0.3	0.4	0.3	0.2	0.4	1.07
Computer Use						
On	30%	30%	29%	34%	41%	--
In sleep mode	22%	23%	22%	20%	7%	--
Off	47%	47%	49%	46%	52%	--
Households with Products						
Telephone (Landline)						
Cell Phone	87%	92%	77%	71%	100%	0.99
Answering Machine or	83%	84%	84%	81%	60%	--
Service	74%	80%	63%	57%	69%	1.07
Multifunction Machine	42%	47%	35%	30%	19%	1.24
Fax Machine	10%	12%	6%	6%	10%	0.70
Printer	54%	60%	47%	39%	18%	0.68
Scanner	20%	22%	17%	11%	9%	0.42
Copier	17%	20%	14%	10%	9%	0.17
Home Network	24%	25%	22%	21%	--	--

[A] Of customers who have a computer.

Table 30. Lighting – by Building Type

	Total (n=2,667)	Single-Family (n=1,720)	Multi 2-4 Units (n=546)	Multi 5+ Units (n=357)	Other (n=25)	Adj. Factor
Mean No. of People per HH	2.6	2.8	2.4	1.8	1.7	----
Incandescents						
None	6%	5%	9%	9%	0%	0.42
1-2	13%	11%	17%	18%	8%	0.10
3-5	22%	19%	26%	30%	37%	0.17
6-10	27%	27%	26%	25%	38%	0.28
11 or more	33%	39%	21%	17%	17%	2.45
CFLs						
None	14%	12%	18%	24%	8%	2.10
1-2	18%	16%	20%	28%	18%	1.05
3-5	26%	26%	26%	25%	26%	0.52
6-10	23%	24%	23%	18%	41%	1.02
11 or more	18%	22%	12%	5%	8%	1.12
Halogen Torchieres						
None	74%	73%	75%	76%	85%	1.20
1-2	20%	20%	20%	19%	15%	0.44
3-5	4%	5%	3%	4%	--	0.22
6-10	1%	1%	<1%	1%	--	1.31
11 or more	1%	1%	1%	1%	0%	--
Fluorescent Torchieres						
None	83%	82%	85%	81%	100%	1.16
1-2	14%	13%	34%	18%	--	0.35
3-5	3%	4%	24%	1%	--	1.31
6-10	1%	1%	9%	--	--	--
11 or more	<1%	1%	<1%	--	--	--
Fluorescent Tube Lights						
None	36%	30%	46%	57%	54%	1.02
1-2	33%	34%	35%	28%	33%	0.58
3-5	21%	24%	14%	11%	13%	0.69
6-10	8%	9%	4%	4%	--	2.39
11 or more	3%	3%	2%	--	--	2.28

Table 31. Miscellaneous Appliances – by Building Type

	Total (n=2,667)	Single-Family (n=1,720)	Multi 2-4 Units (n=546)	Multi 5+ Units (n=357)	Other (n=25)	Adj. Factor
Mean No. of People per HH	2.6	2.8	2.4	1.8	1.7	----
Households with:						
Portable Fan	69%	70%	72%	61%	58%	--
Ceiling Fan	60%	66%	54%	30%	84%	1.02
Attic/Whole-house Fan	10%	13%	4%	3%	--	0.78
Electronic Household Air Cleaner	9%	10%	8%	6%	--	--
Humidifier	26%	28%	22%	21%	5%	1.24
Dehumidifier	46%	59%	23%	7%	33%	1.10
Heated Waterbed	2%	2%	1%	1%	--	0.97
Sauna - electric	1%	1%	<1%	<1%	--	0.97
Electric Whirlpool/Spa	5%	7%	1%	1%	--	1.46
Electric Water Heater for Pool	1%	2%	<1%	<1%	--	2.92
Pond/Well/Pool Pump	16%	22%	3%	1%	3%	1.45
Cordless Vacuum	16%	16%	15%	16%	5%	--
Battery Charger for Appliances	50%	55%	46%	39%	17%	--
Home Security System	19%	24%	10%	7%	--	0.97
Elect. Exercise Equip.	18%	22%	9%	5%	2%	1.12
Electric Clocks/Clock Radios	82%	85%	77%	71%	57%	--
Mean Hours/Day for Dehumidifier						
Summer	7.8	7.9	7.2	2.5	3.7	--
Spring/Fall	4.3	4.3	4.4	3.2	0.0	--
Winter	2.3	2.2	2.9	3.7	1.4	--
Mean Hours/Day for Pool Pumps						
Summer	6.3	6.3	0.0	0.0	6.3	--
Spring/Fall	2.2	3.3	0.0	0.0	2.2	--
Winter	0.7	0.2	3.6	0.0	0.7	--

Table 32. Energy Efficiency – by Building Type

	Total (n=2,667)	Single-Family (n=1,720)	Multi 2-4 Units (n=546)	Multi 5+ Units (n=357)	Other (n=25)	Adj. Factor
Mean No. of People per HH	2.6	2.8	2.4	1.8	1.7	----
ENERGY STAR® Label Familiar (very/somewhat)	80%	82%	78%	71%	69%	--
Influenced Purchase Decision[A]	66%	69%	62%	59%	59%	--
Meaning of ENERGY STAR® Label[A]						
Government Endorsement	2%	1%	2%	1%	0%	--
Tested/Meets Standards	14%	14%	15%	12%	26%	--
High Quality	2%	2%	1%	1%	0%	--
Less Pollution/Good for Environment	3%	2%	5%	8%	0%	--
Uses Less Energy	76%	78%	72%	74%	74%	--
Lower Utility Bills	4%	3%	5%	5%	0%	--
ENERGYGuide Label Familiar (very/somewhat)	76%	80%	69%	61%	59%	--
Information on ENERGYGuide Label[B]						
Government Endorsement	5%	5%	5%	8%	0%	--
Product is Tested/Meets Standards	23%	22%	24%	24%	40%	--
High Quality	6%	5%	8%	7%	3%	--
Appliance Uses Less Energy	29%	29%	28%	34%	37%	--
How Much Energy the Appliance Uses	58%	58%	58%	62%	55%	--
Compares Energy Use to Similar Models	36%	38%	32%	29%	37%	--
Lower Utility Bills	19%	18%	16%	28%	21%	--
Estimated Yearly Operating Cost	41%	43%	37%	35%	60%	--
Familiarity (very/somewhat) with Programs						
Rebate Program	32%	35%	26%	21%	17%	--
Home Energy Audit Program	37%	40%	32%	23%	32%	--
ENERGY STAR® Homes	18%	18%	19%	20%	11%	--
Home Performance with ENERGY STAR®	13%	13%	14%	11%	11%	--

	Total (n=2,667)	Single-Family (n=1,720)	Multi 2-4 Units (n=546)	Multi 5+ Units (n=357)	Other (n=25)	Adj. Factor
Mean No. of People per HH	2.6	2.8	2.4	1.8	1.7	----
Products that Should Receive Rebates						
Light Bulbs and Fixtures	39%	37%	44%	47%	43%	--
Clothes Washers	35%	32%	43%	35%	47%	--
Refrigerators/Freezers	53%	52%	53%	57%	52%	--
Dishwashers	16%	15%	18%	20%	13%	--
Room Air Conditioners	16%	12%	22%	29%	13%	--
Central Cooling Systems	26%	25%	24%	32%	22%	--
Heating Systems	65%	69%	61%	50%	43%	--
Windows	60%	64%	54%	50%	52%	--
Insulation	42%	46%	37%	30%	35%	--
Solar DWH	20%	22%	17%	18%	17%	--
Pool Pumps	1%	2%	1%	0%	0%	--
Geothermal Heat Pump	10%	10%	8%	10%	0%	--
Interest in Services and Products						
Green Power	67%	65%	72%	72%	34%	--
Rebate Programs	76%	79%	77%	75%	63%	--
Home Energy Audits	56%	59%	52%	46%	57%	--

[A] Of customers who have seen the ENERGY STAR® label before.

[B] Of customers who have seen the ENERGYGuide label before.

Table 33. Profile of Respondents – by Building Type

	Total (n=2,667)	Single-Family (n=1,720)	Multi 2-4 Units (n=546)	Multi 5+ Units (n=357)	Other (n=25)	Adj. Factor
Mean No. of People per HH	2.6	2.8	2.4	1.8	1.7	----
Mean Age of Head-of-Household	51.6	52.8	48.8	48.7	59.1	--
Education Level						--
High School Grad. or Less	19%	17%	23%	21%	44%	
College Grad/Some College	51%	51%	52%	49%	44%	--
Postgraduate Degree	30%	31%	25%	29%	12%	--
Mean Household Income	77,033	85,927	60,141	61,398	28,641	--
Mean Time Lived in Home	11.7	13.5	8.9	6.2	12.5	--
Mean Number of Occupants	2.6	2.8	2.4	1.8	1.7	--
Primary Language not English	5%	3%	11%	11%	2%	--

DATA SUMMARY BY PRIMARY HEATING FUEL

The following tables summarize responses to the mail/Internet survey by the customer's type of primary space heating fuel. The fuel type is based on Question B2A of the survey ("What type of heating system do you use to heat this home? Primary Heating."). Primary heating fuel categories are Natural Gas, Electric, Oil, and Other (including bottled gas, wood or coal, and other). The final column presents the adjustment factor developed through the in-home verification visits. For explanations of the development and use of adjustment factors, please refer to the Methodology section.

The number of responses for each fuel type ("n" in the table headers) represents the total number of surveys completed by customers with that fuel type. It should be noted that not every respondent answered every question; therefore the number of responses for any one question might be smaller than the number presented in the table header. Volume 2 of this report presents more detail about the number of responses for each question as well as significant differences between comparison groups.

Table 34. Home Characteristics – by Primary Heating Fuel Type

	Total (n=2,667)	Natural Gas (n=1,085)	Electric (n=337)	Oil (n=844)	Other (n=101)	Adj. Factor
Building Type						
SF Detached	67%	66%	37%	87%	91%	0.99
MF (2-4 units)	20%	27%	24%	12%	7%	0.87
MF (5+ units)	12%	7%	37%	<1%	1%	1.18
Other	1%	1%	2%	1%	1%	0.50
Own Home	81%	83%	69%	92%	97%	--
Year-Round Occupancy	93%	94%	90%	96%	81%	--
Mean No. of Rooms[A]	6.4	6.6	5.0	7.1	6.9	1.05
Mean Dwelling Size (sq. ft)	1,866	1,907	1,431	2,071	2,082	--
Home Built						
Before 1930	26%	29%	13%	26%	17%	--
1930-1969	36%	33%	26%	43%	24%	--
1970-1999	30%	28%	56%	26%	42%	--
2000 or later	8%	10%	6%	5%	17%	--
Home Remodeled in Last 3 Years	25%	26%	19%	28%	29%	--
Natural Gas Service Available	54%	96%	10%	17%	15%	1.14

[A] Excludes bathrooms, halls, pantries, unheated rooms, and garages.

Table 35. Space Heating – by Primary Heating Fuel Type

	Total (n=2,667)	Natural Gas (n=1,085)	Electric (n=337)	Oil (n=844)	Other (n=101)	Adj. Factor
Home Heating						
Pay to Heat Home	92%	100%	100%	100%	100%	0.98
Heat Part of Rent	7%	--	--	--	--	--
No Heat	1%	--	--	--	--	--
Primary Heating System Type[A]						
Natural Gas	49%	100%	--	--	--	1.06
Electric	8%	--	100%	--	--	0.99
Oil	39%	--	--	100%	--	0.94
Bottled Gas	2%	--	--	--	59%	0.66
Wood or Coal	1%	--	--	--	22%	--
Other	1%	--	--	--	18%	0.50
Mean Age of Primary Heating System[A]	12.3	11.4	18.0	12.6	10.3	--
Uses Additional Heating System	32%	29%	18%	37%	52%	0.87
Additional Heating System Type[AB]						
Natural Gas	2%	--	1%	3%	10%	--
Electric	46%	63%	--	35%	37%	--
Oil	6%	6%	11%	--	35%	--
Bottled Gas	10%	8%	14%	12%	7%	--
Wood or Coal	43%	36%	55%	53%	22%	--
Other	14%	12%	35%	16%	8%	--
Use of Additional Heating System[C]						
Always/Often	49%	45%	58%	54%	56%	--
Rarely/Sometimes	51%	55%	42%	46%	44%	--
Have No Thermostats[C]	5%	3%	8%	1%	18%	1.00
Have Programmable Thermostat(s)[C]	41%	47%	25%	42%	36%	1.00
Mean Number of Thermostats[D]						
Total	2.2	2.0	4.4	2.2	2.4	0.79
Programmable	.95	1.0	.09	1.0	1.3	0.73
Standard	1.25	1.0	3.5	1.2	1.1	0.84
Mean Thermostat Setting						
Early a.m. (6-9am)	64.4	64.8	64.6	63.8	63.0	--
Morning (9-1pm)	63.5	63.8	63.8	62.9	63.3	--
Afternoon (1-5pm)	63.7	64.0	64.0	63.1	63.5	--
Evening (5-7pm)	65.8	66.2	65.6	65.2	64.7	--
Night (7pm-6am)	63.0	63.4	63.6	62.1	62.0	--

[A] Of customers who pay to heat their home.

[B] Customers can have more than one additional heating system.

[C] Of customers who heat their residence.

[D] Of customers who have thermostats.

Table 36. Space Cooling – by Primary Heating Fuel Type

	Total (n=2,667)	Natural Gas (n=1,085)	Electric (n=337)	Oil (n=844)	Other (n=101)	Adj. Factor
Have Air Conditioning (Central or Room)	82%	85%	84%	80%	63%	0.99
Central Air Conditioning/Cooling						
Have Central AC	36%	42%	42%	27%	33%	0.82
Do not Have Central AC	64%	58%	58%	73%	67%	1.13
76-100% of Space Conditioned[A]	82%	87%	78%	78%	84%	1.03
Cooling System Type[A]						
Central Air Conditioning	89%	94%	55%	92%	92%	1.19
Heat Pump	8%	5%	49%	3%	8%	0.44
Ductless Mini Split AC	4%	3%	2%	4%	<1%	--
Other	2%	2%	1%	3%	--	--
Mean Number of Cooling Systems[A]	1.2	1.2	1.2	1.3	1.3	0.99
Mean Age of Main Cooling Unit[A]	7.7	7.6	9.1	7.5	7.5	--
Have No Thermostats[B]	8%	4%	15%	7%	<1%	--
Have Programmable Thermostat(s)[B]	49%	58%	27%	47%	73%	1.20
Mean Number of Thermostats[C]						
Total	1.7	1.6	1.7	1.7	2.3	0.94
Programmable	1.0	1.1	0.7	1.0	1.9	1.00
Standard	0.6	0.5	1.0	0.7	0.4	0.87
Mean Thermostat Setting[C]						
Early Morning (6-9am)	72.2	72.6	71.6	71.9	72.5	--
Morning (9-1pm)	72.6	73.0	71.6	72.4	72.8	--
Afternoon (1pm-5pm)	72.5	72.9	71.5	72.1	72.7	--
Early Evening (5pm-7pm)	72.0	72.4	71.5	71.6	72.1	--
Late Evening/Night (7pm-6am)	72.1	72.6	71.2	71.7	72.8	--
Room Air Conditioning						
Have Room AC	63%	62%	66%	64%	42%	--
Do not Have Room AC	37%	38%	34%	36%	58%	--
Mean Number of Room ACs[C]	2.0	2.1	1.6	2.2	1.9	--
Mean Age of Room ACs[C]	5.2	5.0	6.2	5.5	5.3	1.25
Mean Size of Room ACs (BTUs)[C]	7,679	7,847	8,385	7,895	9,036	0.93
Always/Often Use Cooling Systems[C]						
Early Morning (6-9am)	26%	28%	22%	24%	32%	--
Morning (9-1pm)	25%	27%	19%	23%	37%	--
Afternoon (1pm-5pm)	31%	19%	20%	21%	12%	--
Early Evening (5pm-7pm)	37%	18%	16%	19%	12%	--
Late Evening/Night (7pm-6am)	37%	38%	28%	36%	45%	--
Central Air Conditioning						
Very/Somewhat likely to Install[D]	14%	16%	10%	14%	9%	--
Very/Somewhat likely to Replace[C]	29%	28%	32%	28%	25%	--
Room Air Conditioning						
Very/Somewhat likely to Install[D]	15%	18%	18%	11%	2%	--
Very/Somewhat likely to Replace[C]	41%	40%	46%	41%	44%	--

[A] Of customers who pay to cool their home.

[B] Of customers who have central cooling system.

[C] Of customers who have appliance/equipment.

[D] Of customers who do not have appliance/equipment.

Table 37. Water Heating – by Primary Heating Fuel Type

	Total (n=2,667)	Natural Gas (n=1,085)	Electric (n=337)	Oil (n=844)	Other (n=101)	Adj. Factor
Water Heating						
Pay for Hot Water	85%	94%	70%	92%	98%	1.04
Part of Rent/Condo Fee	13%	6%	29%	2%	2%	--
Do not Have Hot Water	2%	<1%	1%	6%	--	--
Primary Water Heater Type[A]						
Natural Gas	52%	92%	6%	10%	7%	1.14
Electric	18%	7%	90%	19%	33%	0.89
Oil	26%	<1%	2%	67%	11%	0.94
Bottled Gas	4%	<1%	1%	3%	46%	0.94
Solar	<1%	<1%	<1%	<1%	<1%	--
Other	<1%	--	--	<1%	2%	--
Mean age of primary water heating system[A]	7.8	6.5	8.2	9.2	8.5	--
Primary water heater has insulation blanket/tank wrap[A]	25%	23%	32%	26%	29%	--
Uses Additional Heating System	3%	2%	3%	4%	8%	0.38
Low-Flow showerheads installed in some/all showers	67%	67%	63%	68%	68%	0.95
Aerators on some/all faucets	51%	51%	46%	52%	54%	1.18

[A] Of customers who pay for hot water in their home.

Table 38. Building Shell – by Primary Heating Fuel Type

	Total (n=2,667)	Natural Gas (n=1,085)	Electric (n=337)	Oil (n=844)	Other (n=101)	Adj. Factor
All Exterior Walls Have Insulation	75%	75%	84%	75%	76%	--
Attic/Ceiling Has Insulation	89%	89%	86%	92%	94%	--
Rating of Attic/ Ceiling Insulation						
0-3 in. (<R-10)	13%	14%	13%	12%	6%	0.40
4-6 in. (R-11-19)	54%	55%	55%	55%	51%	1.26
7-10 in. (R-20-30)	24%	23%	20%	24%	35%	1.01
> 10 in. (R-31+)	9%	8%	11%	9%	9%	0.80
Window Type by Pane (All/Most)						
Single w/ Storm	23%	21%	26%	25%	16%	0.74
Single, no Storm	8%	8%	12%	6%	1%	0.14
Double	57%	58%	53%	55%	71%	1.36
Single/Double	9%	10%	6%	10%	5%	0.67
Triple Pane	3%	2%	4%	4%	6%	0.16
Window Frames (All/Most)						
Vinyl	43%	47%	40%	41%	43%	1.04
Wood	32%	30%	31%	35%	36%	1.05
Wood and Vinyl	17%	18%	9%	20%	18%	0.34
Metal	7%	5%	20%	4%	3%	1.47

Table 39. Laundry Equipment – by Primary Heating Fuel Type

	Total (n=2,667)	Natural Gas (n=1,085)	Electric (n=337)	Oil (n=844)	Other (n=101)	Adj. Factor
Laundry Equipment						
Private Use	88%	93%	72%	98%	94%	0.96
Use in Common Area	8%	3%	23%	1%	--	1.29
No Use in Building	4%	4%	5%	1%	6%	1.00
Clothes Washer Type[A]						
Top Loading	75%	75%	75%	76%	58%	0.98
Front Loading	25%	25%	25%	24%	42%	1.06
Mean Age of Clothes Washer[A]	6.9	6.8	5.8	7.4	6.4	--
Mean Number of Loads per Week[A]						
Total	5.1	5.1	4.9	5.3	4.9	--
Hot Water	0. 7	0.8	0.8	0.7	0.6	--
Warm Water	2.1	2.1	2.0	2.2	2.0	--
Cold Water	2.3	2.2	2.0	2.5	2.2	--
Weekday Use of Laundry Equip. [A]						
Summer (1-5 p.m.)						
Frequently/Occasionally	71%	70%	78%	72%	72%	--
Rarely/Never	29%	30%	22%	28%	28%	--
Winter (5-7 p.m.)						
Frequently/Occasionally	69%	67%	73%	72%	62%	--
Rarely/Never	31%	33%	27%	28%	38%	--
Clothes Dryer	86%	90%	72%	96%	86%	0.97
Clothes Dryer Type[B]						
Natural Gas	24%	43%	2%	6%	6%	0.75
Electric	74%	56%	96%	91%	67%	1.11
Bottled Gas	2%	<1%	1%	2%	27%	--
Mean Age of Clothes Dryer	7.5	7.4	6.8	7.9	6.9	--
Mean % Laundry Loads Line Dried[B]						
Summer	18%	15%	22%	20%	26%	--
Spring/Fall	14%	12%	18%	16%	21%	--
Winter	10%	9%	11%	11%	13%	--

[A] Of customers who have private use of laundry equipment.

[B] Of customers who have a clothes dryer.

Table 40. Food Preparation – by Primary Heating Fuel Type

	Total (n=2,667)	Natural Gas (n=1,085)	Electric (n=337)	Oil (n=844)	Other (n=101)	Adj. Factor
Type of Stovetop/Range[A]						
Natural Gas	39%	67%	6%	14%	10%	0.95
Electric	56%	32%	92%	78%	53%	1.05
Bottled Gas	5%	1%	2%	8%	36%	0.79
Other	<1%	<1%	0%	<1%	<1%	--
Mean Age of Stovetop/Range	8.1	7.7	9.5	8.7	9.1	1.20
Microwave Oven	95%	96%	95%	96%	96%	1.00
George Foreman Type Indoor Grill	32%	33%	35%	33%	24%	--
Dishwasher	75%	79%	74%	76%	81%	0.94
Mean Dishwasher Loads per Week	3.2	3.2	2.8	3.5	3.4	--
Weekday Use of Dishwasher						
Summer (1-5 p.m.)						
Frequently/Occasionally	44%	44%	46%	44%	41%	--
Rarely/Never	56%	56%	54%	56%	59%	--
Winter (5-7 p.m.)						
Frequently/Occasionally	60%	59%	60%	62%	55%	--
Rarely/Never	40%	41%	40%	38%	45%	--
Mean Age of Dishwasher	7.3	7.0	8.3	7.5	8.0	--

[A] Of customers who have a stovetop/range.

Table 41. Refrigerators and Freezers – by Primary Heating Fuel Type

	Total (n=2,667)	Natural Gas (n=1,085)	Electric (n=337)	Oil (n=844)	Other (n=101)	Adj. Factor
Refrigerator	>99%	99%	99%	100%	100%	1.00
Two or More Refrigerators	26%	27%	12%	32%	31%	1.03
Mean Number of Refrigerators	1.3	1.3	1.1	1.3	1.3	1.00
Refrigerator Style						
Single-Door	13%	13%	10%	13%	14%	0.63
Two-Door	86%	86%	90%	87%	86%	1.05
Three or Four-Door	1%	2%	0%	1%	0%	0.88
Refrigerator Size						
Small (under 14 cu. ft.)	14%	12%	15%	14%	16%	0.68
Medium (15-18 cu. ft.)	44%	40%	48%	46%	39%	0.46
Large (more than 19 cu. ft.)	42%	47%	37%	40%	45%	1.73
Defrost Capabilities						
Automatic (Frost-Free)	91%	91%	91%	91%	93%	1.06
Manual	9%	9%	9%	9%	7%	0.47
Mean Age of Refrigerator	7.9	7.8	7.8	8.3	7.3	--
Refrigerator Use						
Year-Round	94%	95%	94%	96%	87%	
Seasonally	6%	5%	6%	4%	13%	--
Stand-Alone Freezer	22%	20%	13%	28%	35%	0.59
Two or More Freezers	1%	1%	<1%	2%	3%	0.97
Mean Number of Freezers	0.2	0.2	0.1	0.3	0.4	0.61
Freezer Style						
Frost-Free	48%	50%	55%	44%	42%	--
Manual Defrost	52%	50%	45%	56%	58%	--
Freezer Size						
Small (under 15 cu. Ft.)	41%	40%	39%	41%	48%	--
Medium (15-18 cu. Ft.)	46%	47%	35%	47%	40%	--
Large (over 18 cu. Ft)	13%	13%	25%	12%	12%	--
Mean Age of Freezer	10.3	10.4	9.4	10.9	8.6	--
Freezer Use						
Year-Round	95%	93%	86%	99%	87%	--
Seasonally	5%	7%	14%	1%	13%	--

Table 42. Entertainment Equipment – by Primary Heating Fuel Type

	Total (n=2,667)	Natural Gas (n=1,085)	Electric (n=337)	Oil (n=844)	Other (n=101)	Adj. Factor
Television	99%	99%	98%	99%	96%	1.00
Mean Number of TVs[A]						
Total	2.5	2.5	2.2	2.5	2.3	1.15
Standard Tube (CRT)	1.8	1.8	1.6	1.9	1.5	1.16
Projection TV	0.1	0.1	0.1	0.1	0.1	0.36
Flat Panel LCD	0.6	0.6	0.4	0.5	0.7	1.38
Flat Panel Plasma	0.1	0.1	0.1	0.1	0.1	0.67
Mean Hours of Operation						
Primary TV						
Weekday	4.9	4.8	4.9	4.9	4.6	--
Weekend	5.8	5.8	6.2	5.8	5.6	--
Additional TVs						
Weekday	2.4	2.4	2.2	2.4	1.9	--
Weekend	3.0	3.0	2.9	3.0	2.3	--
Weekday Use of Primary TV						
Summer (1-5 p.m.)						
Freq./Occasional	59%	60%	63%	59%	48%	--
Rarely/Never	41%	40%	37%	41%	52%	--
Winter (5-7 p.m.)						
Freq./Occasional	85%	85%	82%	86%	78%	--
Rarely/Never	15%	15%	18%	14%	22%	--
Weekday Use of Additional TVs						
Summer (1-5 p.m.)						
Freq./Occasional	37%	38%	36%	38%	23%	--
Rarely/Never	62%	62%	64%	62%	77%	--
Winter (5-7 p.m.)						
Freq./Occasional	56%	56%	49%	58%	47%	--
Rarely/Never	43%	44%	51%	42%	53%	--
Households with Accessories						
Home Theater	14%	15%	10%	16%	12%	1.39
D/A Converter Box	11%	11%	6%	12%	9%	0.20
Analog Cable Box	8%	8%	9%	7%	9%	1.10
Digital Cable Box	49%	49%	47%	51%	48%	1.25
Digital Cable Box with DVR	22%	25%	20%	23%	23%	0.58
DVR Separate from Cable Box	9%	9%	6%	10%	7%	0.62
Digital Satellite Box	9%	9%	7%	9%	18%	0.99
Video Game Player	26%	25%	26%	28%	34%	1.37
DVD Player (or DVD/VCR)	69%	69%	64%	71%	73%	1.19
VCR Only	32%	33%	20%	34%	24%	1.12
Stereo	48%	51%	36%	50%	55%	1.48
Equipment Always or Often Unplugged/Off at Power Strip:						
Primary TV	9%	9%	11%	7%	6%	--
Additional TVs	9%	11%	10%	7%	2%	--
Audio/TV accessories	10%	11%	14%	8%	2%	--
Other equipment	15%	14%	16%	14%	17%	--

[A] Of customers who have a TV.

Table 43. Home Office – by Primary Heating Fuel Type

	Total (n=2,667)	Natural Gas (n=1,085)	Electric (n=337)	Oil (n=844)	Other (n=101)	Adj. Factor
Work from Home	17%	19%	15%	17%	24%	--
Hours per Week Working at Home						
0-10 hrs	39%	38%	58%	38%	48%	--
11-30 hrs	39%	43%	23%	40%	22%	--
More than 30 hrs	22%	19%	19%	22%	29%	--
Computer	82%	84%	77%	83%	85%	1.00
Mean Number of Computers[A]						
Total	1.6	1.6	1.5	1.6	1.8	1.31
Flat panel monitor	1.3	1.3	1.2	1.2	1.3	1.36
CRT monitor	0.4	0.3	0.3	0.4	0.5	1.07
Computer Use						
On	30%	30%	31%	31%	30%	--
In sleep mode	22%	25%	19%	20%	25%	--
Off	47%	46%	50%	49%	45%	--
Households with Products						
Telephone (Landline)	87%	87%	81%	92%	90%	0.99
Cell Phone	83%	85%	84%	84%	75%	--
Answering Machine or Service	74%	74%	66%	79%	84%	1.07
Multifunction Machine	42%	46%	36%	43%	53%	1.24
Fax Machine	10%	11%	5%	11%	13%	0.70
Printer	54%	54%	54%	59%	63%	0.68
Scanner	20%	20%	17%	21%	24%	0.42
Copier	17%	18%	16%	18%	15%	0.17
Home Network	24%	26%	18%	22%	37%	--

[A] Of customers who have a computer.

Table 44. Lighting – by Primary Heating Fuel Type

	Total (n=2,667)	Natural Gas (n=1,085)	Electric (n=337)	Oil (n=844)	Other (n=101)	Adj. Factor
Incandescents						
None	6%	6%	9%	5%	7%	0.42
1-2	13%	13%	14%	11%	9%	0.10
3-5	22%	22%	25%	19%	20%	0.17
6-10	27%	24%	27%	30%	28%	0.28
11 or more	33%	35%	25%	35%	36%	2.45
CFLs						
None	14%	15%	21%	12%	14%	2.10
1-2	18%	18%	18%	16%	7%	1.05
3-5	26%	26%	24%	26%	21%	0.52
6-10	23%	23%	24%	25%	25%	1.02
11 or more	18%	18%	13%	21%	33%	1.12
Halogen Torchieres						
None	74%	73%	75%	75%	76%	1.20
1-2	20%	20%	17%	19%	20%	0.44
3-5	4%	5%	7%	4%	2%	0.22
6-10	1%	1%	<1%	1%	2%	1.31
11 or more	1%	1%	1%	1%	--	--
Fluorescent Torchieres						
None	83%	83%	80%	84%	81%	1.16
1-2	14%	14%	16%	12%	15%	0.35
3-5	3%	3%	1%	3%	4%	1.31
6-10	1%	<1%	--	1%	1%	--
11 or more	<1%	<1%	2%	<1%	<1%	--
Fluorescent Tube Lights						
None	36%	38%	40%	32%	27%	1.02
1-2	33%	33%	38%	33%	29%	0.58
3-5	21%	19%	17%	24%	28%	0.69
6-10	8%	8%	4%	8%	12%	2.39
11 or more	3%	2%	1%	4%	3%	2.28

Table 45. Miscellaneous Appliances – by Primary Heating Fuel Type

	Total (n=2,667)	Natural Gas (n=1,085)	Electric (n=337)	Oil (n=844)	Other (n=101)	Adj. Factor
Households with:						
Portable Fan	69%	65%	63%	74%	76%	--
Ceiling Fan	60%	62%	48%	66%	77%	1.02
Attic or Whole-house Fan	10%	11%	8%	11%	2%	0.78
Electronic Household Air Cleaner	9%	9%	12%	11%	12%	--
Humidifier	26%	29%	19%	24%	39%	1.24
Dehumidifier	46%	48%	38%	53%	49%	1.10
Heated Waterbed	2%	2%	3%	2%	3%	0.97
Sauna - electric	1%	1%	1%	1%	2%	0.97
Electric Whirlpool Tub/Spa	5%	5%	4%	6%	14%	1.46
Electric Water Heater for Pool	1%	2%	2%	2%	--	2.92
Pond, Well, or Pool Pump	16%	12%	13%	22%	34%	1.45
Cordless Vacuum	16%	16%	13%	16%	22%	--
Battery Charger for Appliances	50%	48%	41%	55%	76%	--
Home Security System	19%	22%	17%	19%	25%	0.97
Electric Exercise Equipment	18%	19%	11%	21%	22%	1.12
Electric Clocks/Clock Radios	82%	81%	19%	86%	91%	--
Mean Hours/Day for Dehumidifier						
Summer	7.8	8.1	6.9	7.6	8.3	--
Spring/Fall	4.3	4.6	4.1	3.9	4.5	--
Winter	2.3	2.4	1.6	2.2	3.2	--
Mean Hours/Day for Pool Pumps						
Summer	6.3	6.9	6.4	6.3	2.5	--
Spring/Fall	2.3	3.0	2.5	1.9	0.8	--
Winter	0.7	0.9	1.3	0.6	0.0	--

Table 46. Energy Efficiency – by Primary Heating Fuel Type

	Total (n=2,667)	Natural Gas (n=1,085)	Electric (n=337)	Oil (n=844)	Other (n=101)	Adj. Factor
ENERGY STAR® Label						
Familiar (very/somewhat)	80%	82%	77%	81%	87%	--
Influenced Purchase Decision[A]	66%	66%	64%	69%	76%	--
Meaning of ENERGY STAR® Label[A]						
Government Endorsement	2%	1%	2%	1%	3%	--
Tested/Meets Standards	14%	15%	12%	13%	9%	--
High Quality	2%	2%	<1%	2%	0%	--
Less Pollution/Good for Environment	3%	4%	3%	3%	2%	--
Uses Less Energy	76%	74%	75%	78%	86%	--
Lower Utility Bills	4%	4%	7%	3%	0%	--
ENERGYGuide Label						
Familiar (very/somewhat)	76%	78%	65%	78%	83%	--
Information on ENERGYGuide Label[B]						
Government Endorsement	5%	6%	9%	5%	4%	--
Product is Tested/Meets Standards	23%	22%	26%	23%	17%	--
High Quality	6%	6%	9%	6%	8%	--
Appliance Uses Less Energy	29%	27%	35%	30%	32%	--
How Much Energy the Appliance Uses	58%	58%	59%	60%	70%	--
Compares Energy Use to Similar Models	36%	36%	37%	37%	44%	--
Lower Utility Bills	19%	18%	16%	19%	22%	--
Est. Yearly Operating Cost	41%	39%	40%	45%	48%	--
Familiarity (very/somewhat) with Programs						
Rebate Program	32%	36%	26%	31%	20%	--
Home Energy Audit Program	37%	40%	33%	37%	38%	--
ENERGY STAR® Homes	18%	20%	15%	16%	17%	--
Home Performance with ENERGY STAR®	13%	15%	10%	12%	8%	--
Products that Should Receive Rebates						
Light Bulbs and Fixtures	39%	39%	42%	37%	29%	--
Clothes Washers	35%	33%	33%	37%	29%	--
Refrigerators/Freezers	53%	53%	55%	53%	47%	--
Dishwashers	16%	17%	19%	14%	10%	--
Room Air Conditioners	16%	14%	17%	14%	2%	--
Central Cooling Systems	26%	29%	30%	21%	27%	--
Heating Systems	65%	68%	64%	66%	75%	--
Windows	60%	61%	53%	60%	66%	--
Insulation	42%	45%	32%	42%	58%	--
Solar DWH	20%	17%	24%	25%	35%	--
Pool Pumps	1%	1%	2%	2%	2%	--
Geothermal Heat Pump	10%	8%	15%	12%	10%	--
Interest in Services and Products						
Green Power	67%	67%	63%	67%	69%	--
Rebate Programs	76%	78%	71%	79%	72%	--
Home Energy Audits	56%	57%	48%	59%	58%	--

[A] Of customers who have seen the ENERGY STAR® label before.

[B] Of customers who have seen the ENERGYGuide label before.

Table 47. Profile of Respondents – by Primary Heating Fuel Type

	Total (n=2,667)	Natural Gas (n=1,085)	Electric (n=337)	Oil (n=844)	Other (n=101)	Adj. Factor
Mean Age of Head-of-Household	51.6	51.4	51.9	52.4	51.4	--
Education Level						
High School Graduate or Less	19%	18%	23%	19%	17%	--
College Graduate/Some College	51%	50%	48%	54%	51%	--
Postgraduate Degree	30%	32%	29%	27%	32%	--
Mean Household Income	77,033	82,002	72,521	78,863	81,122	--
Mean Time Lived in Home	11.7	11.1	10.6	13.8	11	--
Mean Number of Occupants	2.6	2.6	2.5	2.8	2.8	--
Primary Language not English	5%	7%	6%	2%	1%	--

DATA SUMMARY BY INCOME CATEGORY

The following tables summarize responses to the mail/Internet survey by the customer's income category. The income classification is based on survey Questions N3 ("Please check the range that best describes your household's total annual income for 2007, before taxes.") and N5 ("For each of the following age groups, how many people, including you, usually live in this home?"). The income categories are:

- **Low Income:** Household income is less than 60% of the median income in Massachusetts, given the number of people in the household.
- **Threshold:** Household income might be less than 60% of the median income in Massachusetts, but determination cannot be made since the 60% level falls within the customer's income range.
- **Not Low Income:** Household income is 60% or more of the median income in Massachusetts, given the number of people in the household.
- **No Response:** Customer did not provide information for either household income or the size of the household.

The final column presents the adjustment factor developed through the in-home verification visits. For explanations of the development and use of adjustment factors, please refer to the Methodology section.

The number of responses for each income category ("n" in the table headers) represents the total number of surveys completed by customers in that category. It should be noted that not every respondent answered every question; therefore the number of responses for any one question might be smaller than the number presented in the table header.

Table 48. Home Characteristics – by Income Category

	Total (n=2,667)	Low Income (n=395)	Threshold (n=385)	Not Low Income (n=1,415)	No Response (n=472)	Adj. Factor
Building Type						
SF Detached	67%	46%	64%	74%	67%	0.99
MF (2-4 units)	20%	34%	23%	16%	19%	0.87
MF (5+ units)	12%	12%	11%	9%	13%	1.18
Other	1%	1%	1%	<1%	1%	0.50
Own Home	81%	54%	77%	89%	85%	--
Year-Round Occupancy	93%	97%	95%	94%	87%	--
Mean No. of Rooms[A]	6.4	5.3	6.0	6.8	6.4	1.05
Mean Dwelling Size (sq. ft)	1,866	1,525	1,622	2,002	1,867	--
Home Built						
Before 1930	26%	29%	30%	25%	25%	--
1930-1969	36%	41%	38%	35%	37%	--
1970-1999	30%	26%	28%	31%	31%	--
2000 or later	8%	4%	4%	9%	8%	--
Home Remodeled in Last 3 Years	25%	18%	25%	29%	20%	--
Natural Gas Service Available	54%	54%	52%	55%	50%	1.14

[A] Excludes bathrooms, halls, pantries, unheated rooms, and garages.

Table 49. Space Heating – by Income Category

	Total (n=2,667)	Low Income (n=395)	Threshold (n=385)	Not Low Income (n=1,415)	No Response (n=472)	Adj. Factor
Home Heating						
Pay to Heat Home	92%	85%	91%	94%	93%	0.98
Heat Part of Rent	7%	14%	9%	5%	6%	--
No Heat	1%	1%	<1%	<1%	2%	--
Primary Heating System Type[A]						
Natural Gas	49%	49%	44%	51%	48%	1.06
Electric	8%	10%	9%	7%	9%	0.99
Oil	39%	39%	42%	38%	38%	0.94
Bottled Gas	2%	<1%	2%	2%	4%	0.66
Wood or Coal	1%	1%	1%	1%	1%	--
Other	1%	1%	2%	<1%	1%	0.50
Mean Age of Primary Heating System[A]	12.3	12.8	13.4	11.9	12.6	--
Uses Additional Heating System	32%	28%	35%	34%	27%	0.87
Additional Heating System Type[AB]						
Natural Gas	2%	3%	3%	1%	2%	--
Electric	46%	41%	45%	48%	44%	--
Oil	6%	8%	9%	5%	4%	--
Bottled Gas	10%	23%	11%	7%	10%	--
Wood or Coal	43%	35%	36%	49%	37%	--
Other	14%	10%	11%	%14	22%	--
Use of Additional Heating System[C]						
Always/Often	49%	51%	53%	50%	41%	--
Rarely/Sometimes	51%	49%	47%	50%	59%	--
Have No Thermostats[C]	5%	11%	6%	3%	5%	1.00
Have Programmable Thermostat(s)[C]	41%	20%	37%	48%	39%	1.00
Mean Number of Thermostats[D]						
Total	2.2	1.8	2.3	2.3	2.2	0.79
Programmable	1.8	0.4	1.1	1.0	0.9	0.73
Standard	2.0	1.4	1.2	1.3	1.3	0.84
Mean Thermostat Setting						
Early a.m. (6-9am)	64.4	64.8	64.4	64.3	64.1	--
Morning (9-1pm)	63.5	64.4	64.0	63.1	63.8	--
Afternoon (1-5pm)	63.7	64.6	63.9	63.4	63.9	--
Evening (5-7pm)	65.8	65.7	65.6	65.9	65.7	--
Night (7pm-6am)	63.0	63.9	63.0	62.8	62.7	--

[A] Of customers who pay to heat their home.

[B] Customers can have more than one additional heating system.

[C] Of customers who heat their residence.

[D] Of customers who have thermostats.

Table 50. Space Cooling – by Income Category

	Total (n=2,667)	Low Income (n=395)	Threshold (n=385)	Not Low Income (n=1,415)	No Response (n=472)	Adj. Factor
Have Air Conditioning (CAC or Room)	82%	75%	83%	83%	81%	0.99
Central Air Cooling						
Have CAC	36%	23%	27%	40%	40%	0.82
No CAC	64%	77%	73%	38%	60%	1.13
76-100% of Space Conditioned[A]	82%	51%	74%	85%	88%	1.03
CAC System Type[A]						
Central AC	89%	85%	79%	90%	92%	1.19
Heat Pump	8%	5%	12%	9%	5%	0.44
Ductless Mini Split	4%	9%	7%	3%	2%	--
Other	2%	5%	4%	2%	2%	--
Mean Number of CAC Systems[A]	1.2	1.1	1.1	1.3	1.2	0.99
Mean Age of Main CAC Unit[A]	7.7	8.2	8.2	7.5	7.8	--
Have No Thermostats[B]	8%	26%	19%	4%	6%	--
Have Programmable Thermostat(s)[B]	49%	23%	34%	56%	46%	1.20
Mean Number of Thermostats[C]						
Total	1.7	1.1	1.3	1.7	1.7	0.94
Programmable	1.0	0.7	0.6	1.1	1.0	1.00
Standard	0.6	0.4	0.7	0.7	0.6	0.87
Mean Thermostat Setting						
Early a.m. (6-9am)	72.2	69.8	72.0	72.2	73.0	--
Morning (9-1pm)	72.6	70.2	72.3	72.7	73.1	--
Afternoon (1-5pm)	72.5	70.1	72.0	72.6	73.0	--
Evening (5-7pm)	72.0	70.1	71.8	72.0	72.6	--
Night (7pm-6am)	72.1	69.6	71.8	72.1	72.9	--
Room AC						
Have Room AC	63%	67%	71%	59%	61%	--
No Room AC	37%	33%	29%	41%	39%	--
Mean Number of Room ACs[C]	2.0	1.7	2.0	2.2	1.8	--
Mean Age of Room ACs[C]	5.2	5.5	5.1	5.1	5.5	1.25
Mean Size of Room ACs (BTUs)[C]	7,679	7,457	7,370	7,746	7,977	0.93
Always/Often Use Cooling Systems[C]						
Early a.m. (6-9am)	26%	18%	16%	30%	27%	--
Morning (9-1pm)	25%	23%	18%	27%	27%	--
Afternoon (1-5pm)	31%	29%	26%	32%	29%	--
Evening (5-7pm)	37%	31%	32%	40%	37%	--
Night (7pm-6am)	37%	28%	30%	41%	34%	--
CAC: Very/Somewhat likely to						
Install[D]	14%	10%	16%	17%	7%	--
Replace[C]	29%	38%	39%	29%	23%	--
Room AC: Very/ Somewhat likely to						
Install[D]	15%	32%	12%	11%	18%	--
Replace[C]	41%	36%	44%	39%	48%	--

[A] Of customers who pay to cool their home.

[B] Of customers who have central cooling system.

[C] Of customers who have appliance/equipment.

[D] Of customers who do not have appliance/equipment.

Table 51. Water Heating – by Income Category

	Total (n=2,667)	Low Income (n=395)	Threshold (n=385)	Not Low Income (n=1,415)	No Response (n=472)	Adj. Factor
Water Heating						
Pay for Hot Water	85%	73%	83%	88%	84%	1.04
Part of Rent	13%	23%	14%	10%	13%	--
No Hot Water	2%	4%	3%	2%	3%	--
Primary Water Heater Type[A]						
Natural Gas	52%	55%	50%	52%	50%	1.14
Electric	18%	18%	20%	17%	21%	0.89
Oil	26%	24%	28%	27%	23%	0.94
Bottled Gas	4%	2%	3%	3%	6%	0.94
Solar	<1%	<1%	-	<1%	<1%	--
Other	<1%	<1%	<1%	<1%	<1%	--
Mean age of primary water heating system[A]	7.8	7.5	8.1	7.7	7.8	--
Primary water heater has insulation blanket/tank wrap[A]	25%	21%	27%	25%	26%	--
Uses Additional Heating System	3%	3%	4%	3%	2%	0.38
Low-Flow shower-heads installed in some/all showers	67%	65%	67%	67%	65%	0.95
Aerators on some/all faucets	51%	45%	51%	53%	48%	1.18

[A] Of customers who pay for hot water in their home.

Table 52. Building Shell – by Income Category

	Total (n=2,667)	Low Income (n=395)	Threshold (n=385)	Not Low Income (n=1,415)	No Response (n=472)	Adj. Factor
All Exterior Walls Have Insulation	75%	63%	71%	77%	80%	--
Attic/Ceiling Has Insulation	89%	76%	89%	91%	90%	--
Rating of Attic/ Ceiling Insulation						
0-3 in. (<R-10)	13%	16%	16%	12%	12%	0.40
4-6 in. (R-11-19)	54%	58%	59%	54%	51%	1.26
7-10 in. (R-20-30)	24%	20%	19%	26%	25%	1.01
> 10 in. (R-31+)	9%	6%	6%	9%	12%	0.80
Window Type by Pane (All/Most)						
Single w/ Storm	23%	31%	21%	21%	26%	0.74
Single, no Storm	8%	13%	6%	7%	8%	0.14
Double	57%	44%	60%	59%	56%	1.36
Single/Double	9%	9%	9%	11%	6%	0.67
Triple Pane	3%	3%	3%	3%	4%	0.16
Window Frames (All/Most)						
Vinyl	43%	44%	49%	43%	40%	1.04
Wood	32%	29%	24%	34%	34%	1.05
Wood and Vinyl	17%	13%	18%	17%	19%	0.34
Metal	7%	13%	9%	5%	7%	1.47

Table 53. Laundry Equipment – by Income Category

	Total (n=2,667)	Low Income (n=395)	Threshold (n=385)	Not Low Income (n=1,415)	No Response (n=472)	Adj. Factor
Laundry Equipment						
Private Use	88%	75%	88%	93%	87%	0.96
Common Area Use	8%	16%	8%	6%	9%	1.29
No Use in Building	4%	9%	4%	2%	5%	1.00
Clothes Washer Type[A]						
Top Loading	75%	86%	79%	70%	80%	0.98
Front Loading	25%	14%	21%	30%	20%	1.06
Mean Age of Clothes Washer[A]	6.9	7.1	6.9	6.6	7.8	--
Mean Number of Loads per Week[A]						
Total	5.1	4.9	5.3	5.2	4.7	--
Hot Water	0.7	0.8	0.8	0.7	0.6	--
Warm Water	2.1	1.6	2.0	2.2	2.2	--
Cold Water	2.3	2.5	2.4	2.3	1.9	--
Weekday Use of Laundry Equip.[A]						
Summer (1-5 p.m.)						
Freq./Occasional	71%	79%	79%	68%	72%	--
Rarely/Never	29%	21%	21%	32%	28%	--
Winter (5-7 p.m.)						
Freq./Occasional	69%	70%	75%	68%	64%	--
Rarely/Never	31%	30%	25%	32%	36%	--
Clothes Dryer	86%	69%	85%	91%	84%	0.97
Clothes Dryer Type[B]						
Natural Gas	24%	19%	22%	25%	25%	0.75
Electric	74%	79%	76%	73%	72%	1.11
Bottled Gas	2%	2%	2%	2%	3%	--
Mean Age of Clothes Dryer	7.5	8.0	7.2	7.3	8.3	--
Mean % Laundry Loads Line Dried[B]						
Summer	18%	28%	19%	16%	19%	--
Spring/Fall	14%	22%	15%	13%	14%	--
Winter	10%	14%	8%	10%	9%	--

[A] Of customers who have private use of laundry equipment.

[B] Of customers who have a clothes dryer.

Table 54. Food Preparation – by Income Category

	Total (n=2,667)	Low Income (n=395)	Threshold (n=385)	Not Low Income (n=1,415)	No Response (n=472)	Adj. Factor
Type of Stovetop/Range[A]						
Natural Gas	39%	41%	39%	40%	36%	0.95
Electric	56%	55%	58%	54%	60%	1.05
Bottled Gas	5%	4%	3%	6%	5%	0.79
Other	<1%	-	<1%	<1%	-	--
Mean Age of Stovetop/Range	8.1	7.9	8.2	7.9	9.2	1.20
Microwave Oven	95%	89%	97%	97%	95%	1.00
George Foreman Type Indoor Grill	32%	28%	35%	32%	35%	--
Dishwasher	75%	46%	68%	86%	74%	0.94
Mean Dishwasher Loads per Week	3.2	2.9	3.0	3.3	3.3	--
Weekday Use of Dishwasher						
Summer (1-5 p.m.)						
Freq./Occasional	44%	43%	50%	42%	49%	--
Rarely/Never	56%	57%	50%	58%	51%	--
Winter (5-7 p.m.)						
Freq./Occasional	60%	59%	64%	60%	56%	--
Rarely/Never	40%	41%	35%	40%	44%	--
Mean Age of Dishwasher	7.3	8.2	7.3	6.9	8.3	--

[A] Of customers who have a stovetop/range.

Table 55. Refrigerators and Freezers – by Income Category

	Total (n=2,667)	Low Income (n=395)	Threshold (n=385)	Not Low Income (n=1,415)	No Response (n=472)	Adj. Factor
Refrigerator	>99%	99%	>99%	>99%	>99%	1.00
Two or More Refrigerators	26%	19%	19%	31%	22%	1.03
Mean Number of Refrigerators	1.3	1.2	1.2	1.3	1.2	1.00
Refrigerator Style						
Single-Door	13%	14%	12%	12%	13%	0.63
Two-Door	86%	85%	87%	86%	86%	1.05
Three or Four-Door	1%	<1%	1%	1%	<1%	0.88
Refrigerator Size						
Small (under 14 cu. ft.)	14%	19%	15%	13%	16%	0.68
Medium (15-18 cu. ft.)	44%	50%	45%	42%	45%	0.46
Large (more than 19 cu. ft.)	42%	31%	40%	45%	39%	1.73
Defrost Capabilities						
Automatic (Frost-Free)	91%	88%	92%	91%	91%	1.06
Manual	9%	12%	8%	9%	9%	0.47
Mean Age of Refrigerator	7.9	7.4	8.2	7.8	8.4	--
Refrigerator Use						
Year-Round	94%	97%	95%	95%	90%	
Seasonally	6%	3%	5%	5%	10%	--
Stand-Alone Freezer	22%	25%	26%	20%	24%	0.59
Two or More Freezers	1%	2%	1%	1%	1%	0.97
Mean Number of Freezers	0.2	0.3	0.3	0.2	0.2	0.61
Freezer Style						
Frost-Free	48%	57%	42%	50%	42%	--
Manual Defrost	52%	43%	58%	50%	58%	--
Freezer Size						
Small (under 15 cu. Ft.)	41%	36%	46%	40%	42%	--
Medium (15-18 cu. Ft.)	46%	45%	43%	48%	44%	--
Large (over 18 cu. Ft)	13%	20%	11%	12%	15%	--
Mean Age of Freezer	10.3	9.9	8.9	10.6	11.1	--
Freezer Use						
Year-Round	95%	98%	92%	97%	90%	--
Seasonally	5%	2%	8%	3%	10%	--

Table 56. Entertainment Equipment – by Income Category

	Total (n=2,667)	Low Income (n=395)	Threshold (n=385)	Not Low Income (n=1,415)	No Response (n=472)	Adj. Factor
Television	99%	98%	99%	99%	99%	1.00
Mean Number of TVs[A]						
Total	2.4	2.2	2.4	2.5	2.3	1.15
Standard Tube (CRT)	1.7	1.8	1.9	1.7	1.7	1.16
Projection TV	<0.1	<0.1	<0.1	0.1	<0.1	0.36
Flat Panel LCD	0.6	0.3	0.5	0.6	0.5	1.38
Flat Panel Plasma	<0.1	<0.1	<0.1	0.1	<0.1	0.67
Mean Hours of Operation						
Primary TV						
Weekday	4.9	5.9	5.5	4.5	4.7	--
Weekend	5.8	6.7	6.5	5.6	5.4	--
Additional TVs						
Weekday	2.4	3.4	2.6	2.1	2.6	--
Weekend	3.0	4.6	3.5	2.6	3.1	--
Weekday Use of Primary TV						
Summer (1-5 p.m.)						
Freq./Occasional	59%	78%	69%	52%	61%	--
Rarely/Never	41%	22%	31%	48%	48%	--
Winter (5-7 p.m.)						
Freq./Occasional	85%	91%	89%	85%	78%	--
Rarely/Never	15%	9%	11%	15%	22%	--
Weekday Use of Additional TVs						
Summer (1-5 p.m.)						
Freq./Occasional	38%	62%	47%	31%	41%	--
Rarely/Never	62%	38%	53%	69%	59%	--
Winter (5-7 p.m.)						
Freq./Occasional	56%	69%	64%	52%	57%	--
Rarely/Never	43%	31%	36%	48%	43%	--
Households with Accessories:						
Home Theater	14%	9%	13%	17%	11%	1.39
D/A Converter Box	11%	15%	12%	10%	9%	0.20
Analog Cable Box	8%	9%	9%	8%	10%	1.10
Digital Cable Box	49%	36%	49%	51%	49%	1.25
Digital Cable Box+DVR	22%	11%	20%	27%	15%	0.58
Separate DVR	9%	6%	6%	11%	9%	0.62
Digital Satellite Box	9%	9%	10%	9%	6%	0.99
Video Game Player	26%	27%	25%	28%	17%	1.37
DVD Player, DVD/VCR	69%	57%	63%	74%	62%	1.19
VCR Only	32%	33%	26%	34%	30%	1.12
Stereo	48%	38%	36%	54%	46%	1.48
Equipment Always or Often Unplugged/Off at Power Strip:						
Primary TV	9%	13%	9%	7%	11%	--
Additional TVs	9%	17%	9%	7%	11%	--
Audio/TV accessories	10%	20%	8%	10%	9%	--
Other equipment	15%	18%	15%	13%	21%	--

[A] Of customers who have a TV.

Table 57. Home Office – by Income Category

	Total (n=2,667)	Low Income (n=395)	Threshold (n=385)	Not Low Income (n=1,415)	No Response (n=472)	Adj. Factor
Work from Home	17%	9%	10%	22%	16%	--
Hours per Week Working at Home						
0-10 hrs	39%	27%	28%	39%	52%	--
11-30 hrs	39%	43%	43%	40%	30%	--
More than 30 hrs	22%	30%	29%	20%	18%	--
Computer	82%	66%	78%	91%	70%	1.00
Mean Number of Computers[A]						
Total	1.6	1.4	1.4	1.7	1.5	1.31
Flat panel monitor	1.2	1.1	1.0	1.3	1.2	1.36
CRT monitor	0.3	0.4	0.4	0.3	0.3	1.07
Computer Use						
On	30%	39%	34%	30%	27%	--
In sleep mode	22%	15%	18%	24%	20%	--
Off	47%	46%	48%	47%	53%	--
Households with Products						
Telephone (Landline)	87%	79%	86%	89%	89%	0.99
Cell Phone	83%	70%	82%	90%	75%	--
Answering Machine/Svc	74%	57%	77%	87%	73%	1.07
Multifunction Machine	42%	24%	37%	51%	33%	1.24
Fax Machine	10%	6%	8%	13%	7%	0.70
Printer	54%	36%	54%	61%	49%	0.68
Scanner	20%	15%	21%	22%	14%	0.42
Copier	17%	12%	18%	19%	16%	0.17
Home Network	24%	9%	15%	32%	17%	--

[A] Of customers who have a computer.

Table 58. Lighting – by Income Category

	Total (n=2,667)	Low Income (n=395)	Threshold (n=385)	Not Low Income (n=1,415)	No Response (n=472)	Adj. Factor
Incandescents						
None	6%	12%	8%	4%	6%	0.42
1-2	13%	20%	13%	11%	15%	0.10
3-5	22%	25%	28%	20%	18%	0.17
6-10	27%	29%	26%	27%	26%	0.28
11 or more	33%	14%	25%	38%	36%	2.45
CFLs						
None	14%	17%	11%	15%	12%	2.10
1-2	18%	25%	17%	16%	21%	1.05
3-5	26%	23%	29%	26%	28%	0.52
6-10	23%	20%	24%	24%	21%	1.02
11 or more	18%	14%	19%	20%	17%	1.12
Halogen Torchieres						
None	74%	72%	79%	73%	77%	1.20
1-2	20%	20%	17%	21%	19%	0.44
3-5	4%	6%%	3%	5%	3%	0.22
6-10	1%	1%	-	1%	1%	1.31
11 or more	1%	1%	1%	1%	<1%	--
Fluorescent Torchieres						
None	83%	84%	85%	83%	78%	1.16
1-2	14%	14%	13%	13%	17%	0.35
3-5	3%	1%	2%	3%	4%	1.31
6-10	1%	-	<1%	1%	-	--
11 or more	<1%	-	-	1%	1%	--
Fluorescent Tube Lights						
None	36%	42%	29%	38%	31%	1.02
1-2	33%	35%	40%	29%	40%	0.58
3-5	21%	15%	19%	22%	21%	0.69
6-10	8%	7%	8%	9%	4%	2.39
11 or more	3%	1%	4%	3%	4%	2.28

Table 59. Miscellaneous Appliances – by Income Category

	Total (n=2,667)	Low Income (n=395)	Threshold (n=385)	Not Low Income (n=1,415)	No Response (n=472)	Adj. Factor
Households with:						
Portable Fan	69%	74%	72%	69%	64%	--
Ceiling Fan	60%	51%	63%	61%	59%	1.02
Attic/Whole-house Fan	10%	6%	10%	11%	9%	0.78
Electronic Household Air Cleaner	9%	8%	10%	10%	8%	--
Humidifier	26%	19%	24%	28%	24%	1.24
Dehumidifier	46%	30%	39%	50%	53%	1.10
Heated Waterbed	2%	1%	2%	2%	2%	0.97
Sauna - electric	1%	0%	0%	1%	0%	0.97
Electric Whirlpool/Spa	5%	1%	2%	8%	3%	1.46
Electric Water Heater for Pool	1%	2%	0%	2%	1%	2.92
Pond/Well/Pool Pump	16%	11%	14%	17%	17%	1.45
Cordless Vacuum	16%	12%	15%	18%	14%	--
Battery Charger for Appliances	50%	37%	50%	58%	38%	--
Home Security System	19%	8%	13%	23%	20%	0.97
Elect. Exercise Equip.	18%	11%	13%	22%	13%	1.12
Electric Clocks/Clock Radios	82%	71%	80%	86%	78%	--
Mean Hours/Day for Dehumidifier						
Summer	7.8	6.3	7.8	7.9	8.1	--
Spring/Fall	4.3	3.5	3.4	4.5	4.5	--
Winter	2.3	3.2	1.5	2.5	1.8	--
Mean Hours/Day for Pool Pumps						
Summer	6.3	4.3	4.9	6.9	6.1	--
Spring/Fall	2.3	1.9	1.6	2.6	1.6	--
Winter	0.7	1.0	0.7	0.7	0.6	--

Table 60. Energy Efficiency – by Income Category

	Total (n=2,667)	Low Income (n=395)	Threshold (n=385)	Not Low Income (n=1,415)	No Response (n=472)	Adj. Factor
ENERGY STAR® Label						
Familiar (very/somewhat)	80%	67%	79%	85%	75%	--
Influenced Purchase Decision[A]	66%	55%	65%	71%	63%	--
Meaning of ENERGY STAR® Label[A]						
Government Endorsement	2%	2%	2%	1%	2%	--
Tested/Meets Standards	14%	14%	16%	13%	15%	--
High Quality	2%	2%	2%	1%	3%	--
Less Pollution/Good for Environment	3%	4%	3%	3%	3%	--
Uses Less Energy	76%	71%	74%	78%	76%	--
Lower Utility Bills	4%	7%	4%	3%	2%	--
ENERGYGuide Label						
Familiar (very/somewhat)	76%	63%	73%	81%	73%	--
Information on ENERGYGuide Label[B]						
Government Endorsement	5%	7%	6%	5%	6%	--
Product is Tested/Meets Standards	23%	24%	23%	23%	21%	--
High Quality	6%	9%	8%	5%	5%	--
Appliance Uses Less Energy	29%	37%	33%	26%	32%	--
How Much Energy the Appliance Uses	58%	48%	57%	61%	57%	--
Compares Energy Use to Similar Models	36%	24%	29%	40%	35%	--
Lower Utility Bills	19%	26%	19%	18%	17%	--
Est. Yearly Operating Cost	41%	29%	40%	44%	39%	--
Familiarity (very/somewhat) with Programs						
Rebate Program	32%	25%	30%	34%	30%	--
Home Energy Audit Program	37%	29%	34%	39%	40%	--
ENERGY STAR® Homes	18%	16%	18%	19%	17%	--
Home Performance with ENERGY STAR®	13%	14%	11%	13%	13%	--
Products that Should Receive Rebates						
Light Bulbs and Fixtures	39%	53%	38%	37%	41%	--
Clothes Washers	35%	38%	36%	34%	36%	--
Refrigerators/Freezers	53%	59%	59%	49%	59%	--
Dishwashers	16%	12%	15%	16%	20%	--
Room Air Conditioners	16%	30%	17%	13%	13%	--
Central Cooling Systems	26%	10%	19%	31%	21%	--
Heating Systems	65%	50%	63%	69%	64%	--
Windows	60%	53%	60%	62%	53%	--
Insulation	42%	31%	45%	44%	40%	--
Solar DWH	20%	19%	19%	22%	17%	--
Pool Pumps	1%	2%	1%	1%	2%	--
Geothermal Heat Pump	10%	7%	11%	10%	8%	--

	Total (n=2,667)	Low Income (n=395)	Threshold (n=385)	Not Low Income (n=1,415)	No Response (n=472)	Adj. Factor
Interest in Services and Products						
Green Power	67%	65%	62%	71%	56%	--
Rebate Programs	78%	73%	75%	81%	73%	--
Home Energy Audits	56%	54%	54%	59%	46%	--

[A] Of customers who have seen the ENERGY STAR® label before.

[B] Of customers who have seen the ENERGYGuide label before.

Table 61. Profile of Respondents – by Income Category

	Total (n=2,667)	Low Income (n=395)	Threshold (n=385)	Not Low Income (n=1,415)	No Response (n=472)	Adj. Factor
Mean Age of Head-of-Household	51.6	51.4	51.9	50.6	55.0	--
Education Level						
High School Graduate or Less	19%	48%	30%	8%	21%	--
College Graduate/Some College	51%	46%	57%	52%	50%	--
Postgraduate Degree	30%	6%	14%	40%	29%	--
Mean Household Income	77,034	19,840	46,090	101,502	64,188	--
Mean Time Lived in Home	11.7	11.0	12.1	11.2	13.7	--
Mean Number of Occupants	2.6	2.7	2.7	2.6	2.5	--
Primary Language not English	5%	14%	5%	4%	3%	--