



Final Report

Project 1B Chain & Franchise

Market Characterization

Massachusetts Energy Efficiency Programs'
Large Commercial & Industrial Evaluation



Prepared for: Massachusetts Energy Efficiency Program Administrators
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1. Executive Summary

This report presents the Phase One results of the Project 1B Market Characterization of Chains & Franchises (C&F) for the evaluation of the large commercial and industrial (C&I) programs operated by the Massachusetts program administrators (PA). The research tasks were conducted as outlined in the 2010 LCIEC Project 1B Work Plan.¹

1.1 Evaluation Objectives

The principal research objectives of the C&F Market Characterization are listed below:

- Characterize the C&F market in Massachusetts, including estimates of size and key segments (big box, retail, restaurant, etc).
- Identify the key decision-maker at C&F customers and the major barriers to the adoption of energy efficiency measures.
- Understand the decision-making process, in particular free-ridership, regarding energy efficiency at C&F businesses in Massachusetts and in comparable non-program states.
- Assess the current level of program participation and methods to increase participation
- Identify the opportunities for increased energy efficiency through on-site inventories of building shell characteristics, end use technologies, and missed opportunities

1.2 Overview of Approach

In conducting this characterization of the C&F market, we defined C&F customers as follows:

- Both chains and franchises. In general, chains are businesses that share a brand and central management, and typically have standard business practices; examples include Walmart and Home Depot. In contrast, franchises are independently owned but share the same brand; one example is McDonalds. While chains typically have a more centralized decision-making process than do franchises, both chains and franchises have a regional or national perspective.

¹¹ Massachusetts Large Commercial and Industrial Evaluation Contractor (LCIEC). *Final Work Plan Project 1B Chain & Franchise Market Characterization*. Prepared for the Massachusetts Energy Efficiency Program Administrators. August 6, 2010.

- C&F businesses located in both newly constructed buildings and existing buildings.
- Both regional and national C&F customers.
- All C&F customers regardless of the size of the individual business location or the aggregated size of all locations in Massachusetts. However, C&F customers with more and/or larger locations will be emphasized in the research as they likely consume more energy.

Phase One of the C&F market characterization study includes the following research tasks:

- **Literature Review.** A summary of six recent studies of commercial building stock inventories and efficiency-related decision making for national accounts and franchises.
- **Re-analysis of Interview Data.** Analysis of interview data from past NSTAR commercial and industrial program impact evaluations in order to investigate potential differences in free-ridership and spillover rates of C&F and non-C&F participants.
- **Customer Quantitative Profile.** This analysis characterizes the size and composition of the population of Massachusetts' C&F customers.
- **Interviews with PA National Account Managers.** These in-depth interviews with PA national account managers provide a solid foundation for understanding the decision-making process of the C&F customers in Massachusetts.
- **Interviews with C&F Management.** These in-depth telephone interviews with C&F customers provide a qualitative representation of the attitudes, behaviors, and practices of C&F organizations.

The findings from the Phase One tasks will influence the scope of the Phase Two work, whose potential research activities were outlined in the 2010 LCIEC Project 1B Work Plan.

1.3 Conclusions

In this section we present conclusions derived from the findings of Phase One of the market characterization study.

Underlying this market characterization study are concerns by program planners that C&F customers may be influenced by the programs to a lesser degree than non-C&F customers, due

to their regional or national corporate structure. In order to address this concern, the LCIEC team integrated the Phase One findings to answer the following key research questions:

- Does the C&F market merit a market characterization study?
- Is the level of program influence less for C&F customers than non-C&F customers?

Based on the results of the Phase One research activities, the LCIEC team believes it can conclusively say that the C&F market in Massachusetts warrants an independent market characterization study. As to the question of program influence, study results do not conclusively support the notion that program influence is lower for C&F customers. Below we consider the evidence gathered in the market characterization study in order to answer these questions.

The C&F market in Massachusetts appears to be a large heterogeneous market that merits a market characterization study. The quantitative profile conservatively estimates that there are nearly 5,000 C&F locations in Massachusetts, with an annual average of about 400 construction projects over each of the past five years. In addition, C&F customers represented about 20 percent of participants and electricity savings in a sample of NSTAR's C&I programs between 2004 and 2007. Both of these findings indicate that the C&F market in Massachusetts is of sufficient size to warrant an independent analysis.

It is important to note that the C&F market is not homogenous, as there appear to be substantial differences between chains and franchises, which represent about 25 percent and 75 percent of the C&F market in Massachusetts, respectively. Chain interviewees were more likely to oversee a larger geographic area. They tended to rely on specialized departments within their companies to make decisions; operating and maintenance costs were often key factors in their decisions. At franchise locations, by contrast, it was the owner who was most frequently responsible for decision-making, and these owners tended to consider primarily initial costs in their decisions. These inherent differences indicate that chains and franchises may require differing approaches. However, our interviewing revealed that the categorization of a business as a chain or franchise can be complex; many franchise businesses may also permit corporate ownership.

Even within the chain sub-market, there may be large differences in the level of energy sophistication. Due to their high energy use intensity, grocery stores and healthcare facilities may be more likely to have specialized energy managers on staff than retailers, for example.

Additionally, it appears that some restaurant chains may be constrained by construction specifications and thus less likely to participate in programs.

The study results do not conclusively support the notion that program influence is different for C&F customers than non-C&F customers. C&F customers provided a wide range of responses in regard to the degree and nature of the influence of PA programs on renovation and construction activities that affect energy efficiency. This diversity of response mirrors to some extent the heterogeneity of the C&F customer segment. These results are discussed in further detail below.

- **The program incentives appear to help C&F customers overcome financial hurdles – such as payback period – in order to gain the approval of upper management.** Many chain interviewees emphasized the impact of program incentives on overcoming financial hurdles and helping customers incorporate additional energy efficiency features into their existing plans. In addition, the C&F interviewees provided relatively high ratings – about a seven on a ten-point scale – regarding the level of program influence on their decision to install energy efficient equipment at Massachusetts locations. These findings suggest that the program has a moderate effect on the decisions of C&F customers.
- **Some C&F customers may utilize the programs as an opportunity to pilot test new designs or technologies.** Some chain interviewees reported that they first roll out design changes or new technologies at locations with the greatest savings, suggesting that Massachusetts – with both program incentives and relatively high energy costs – may be among the pilot regions. The literature review supports this finding, as national accounts were found to be more aggressive in implementing energy efficient retrofit projects in regions with good rebate programs. These findings suggest that Massachusetts locations may accrue energy savings earlier than elsewhere.
- **Some C&F customers use standardized plans for new stores, which may necessitate early program intervention.** In order to successfully influence the decisions of these chain stores, the programs may need to convince these customers to make changes to all of their locations and not just those located in Massachusetts. This situation emphasizes the importance of early program involvement, as designs that are not included in the base plans are unlikely to be changed for the collection of program incentives.

- **C&F customers with nationwide energy efficiency guidelines in place may still be influenced by the programs.** About one-half of the C&F interviewees reported that their organization had energy efficiency guidelines in place; however, only one-quarter of all interviewees reported that the guidelines were formalized in a written document. In addition, nearly all of the interviewees with corporate energy efficiency guidelines in place said that the guidelines and criteria were consistent nationwide. The NSTAR survey re-analysis found that C&F participants were significantly more likely to have an energy efficiency policy in place than non-C&F customers (70 percent vs. 42 percent); however of those with polices in place, C&F customers were significantly less likely to have written policies than non-C&F customers (36 percent vs. 66 percent). Although most C&F policies apply nationwide, they appear to be more general in nature, and therefore flexible. This suggests that, in most cases, programs retain an opportunity to influence local projects, even if the customer has a national policy in place.
- **C&F customers may have lower barriers to energy efficiency than non-C&F customers.** C&F customers identified several common barriers to energy efficiency – upfront costs, payback period, and lack of capital – that likely apply to non-C&F customers as well. National account managers believe that the barriers faced by C&F customers are similar to other customers, but probably are less steep because of their greater financial and staffing resources. However, one concern that may be unique to chains is the impact of design changes on the quality of their customers’ experiences. Some of the larger chain interviewees reported that all new equipment, especially lighting, must be tested before it is implemented in a widespread fashion.
- **It appears that the level of program influence does not vary by measure type between C&F and non-C&F customers.** The literature review found that, for the 2005 National Grid programs, free-ridership for new construction lighting purchases was significantly lower for C&F customers than for other commercial customers, though free-ridership for new construction HVAC was significantly higher for C&F customers. However, C&F respondents interviewed for this study reported no substantial difference in decision-making process by measure type; they did report differences for equipment replacement vs. new construction. In addition, interviewees provided similar program influence ratings (about a seven on a ten-point scale) regardless of equipment type. Lastly, the NSTAR survey re-analysis found no difference in free-ridership for lighting vs. non-lighting measures. The weight of the evidence suggests that program influence does not differ by measure type between C&F customers and non-C&F customers.

1.4 Suggestions for Phase 2 Research

In light of the conclusions, we present suggestions to consider for the Phase Two research.

Given the uncertainty regarding the level of program influence for C&F customers and the potential energy savings this sector offers, we suggest conducting the following research activities in Phase Two of the market characterization study. These research activities will provide an assessment of the current participation patterns for all C&F customers across the entire state, in-depth knowledge of select target markets (e.g. grocery and healthcare) and NTGR for selected C&F market sectors.

We suggest implementing these research activities using a step-by-step approach, where the results of the initial tasks inform the decision to continue with, as well as the approach for, the subsequent tasks.

- Analyze recent Mass Save program tracking data in order to better understand the participation patterns of C&F customers in Massachusetts programs. While we found that C&F customers represented about 20 percent of NSTAR participants and electricity savings from a 2004-2007 survey sample, it is important to assess the current level of C&F participation across the entire state. This analysis will provide recent statewide estimates regarding the percent of projects, as well as electric and gas savings, accounted for by C&F customers. It also will provide information on C&F projects compared to non-C&F projects regarding equipment replacement vs. new construction, measure type, and prescriptive vs. custom tracks.
- Conduct a telephone survey of recent Mass Save program participants in order to develop NTG Ratios for C&F participants vs. non-C&F participants, and thus, provide a more complete assessment of program influence. While the NSTAR survey re-analysis provided some insight into the question of free-ridership, the studies on which the analysis was based were not designed to support such an analysis and therefore did not provide a sufficient sample of C&F customers. In addition, the survey results are now several years out of date.

Rather than implementing a separate study, an option to consider is an expansion of the annual C&I NTG study to include targeted analyses of the C&F market. More specifically, we suggest oversampling C&F customers to ensure sufficient sample sizes are obtained to perform statistically meaningful comparisons. This may require surveys

across multiple program years. In addition, it may be worthwhile to target only chains (and exclude franchises), or even target solely grocery and healthcare chains, in order to provide more detail about sectors that appear to have the greatest potential for future energy savings. Food stores (which includes grocery stores) represent about 18 percent of all C&F locations in Massachusetts, and hospital/healthcare facilities represented 6 percent of construction projects and 13 percent of construction value. To the extent possible, we will compare NTGR by C&F sector and measure type. The sample could be developed in conjunction with the program data analysis task presented above.

- We suggest continuing with the on-site tasks proposed in the 2010 LCIEC Project 1B Work Plan. These tasks will provide greater clarity regarding the influence of the Massachusetts programs by comparing the efficiency level of equipment installed at C&F locations in Massachusetts and a comparison state(s). We anticipate that this study would be approached in a case study fashion, by comparing the results from a Massachusetts location to a non-program location for the same C&F customer. These results will allow us to compare the efficiency level of the same equipment installed at Massachusetts and non-program locations owned by the same C&F customer. In addition, we will compare the decision-making process behind equipment purchases to understand in detail why the efficiency of equipment installed is or is not different at Massachusetts locations.

In order to reduce study costs, we suggest integrating these on-sites with the on-sites planned for the new construction market characterization study, again by oversampling C&F customers. It may be more valuable to target chains, particularly grocery and healthcare chains. However, the details of this plan will likely be shaped by the results of the earlier research tasks.

- On-sites at C&F locations in Massachusetts. These on-site visits will assess program effects on the adoption of efficient equipment and design practices at C&F locations in Massachusetts. In addition, after each site visit, we will conduct a follow-up interview with the decision-maker(s) responsible for energy management decisions at the site visited.
- On-sites at C&F locations in comparison markets. These site visits will mirror those conducted in Massachusetts and also will include follow-up interviews with decision-maker(s). Comparison region(s) will be selected based on the presence of similar C&F customers and screened to ensure that there is no history of C&I



programs. Ideally, comparison areas will have similar electric and gas rates as Massachusetts.

2. Introduction

This report provides the results of the Project 1B Market Characterization of Chains & Franchises (C&F) for the evaluation of the large commercial and industrial (C&I) programs operated by the Massachusetts program administrators (PA). In this section we provide a review the study objectives, summarize the evaluation approach, and describe the organization of the remainder of the report.

2.1 Evaluation Objectives

The overarching objective of the LCIEC Market Characterization study is the following:

“The overall objective of each characterization study is to define the attributes of a specific market area in enough detail that the program planners and administrators can use the information for improving program implementation.”

The principal research objectives of the C&F Market Characterization are provided in Table 2-1.

Table 2-1: Research Objectives

#	Primary Objective
1	Characterize the C&F market in Massachusetts, including estimates of size and key segments (big box, retail, restaurant, etc).
2	Identify the key decision-maker at C&F customers and the major barriers to the adoption of energy efficiency measures.
3	Understand the decision-making process, in particular free-ridership, regarding energy efficiency at C&F businesses in Massachusetts and in comparable non-program states.
4	Assess the current level of program participation and methods to increase participation
5	Identify the opportunities for increased energy efficiency through on-site inventories of building shell characteristics, end use technologies, and missed opportunities

2.2 Overview of Approach

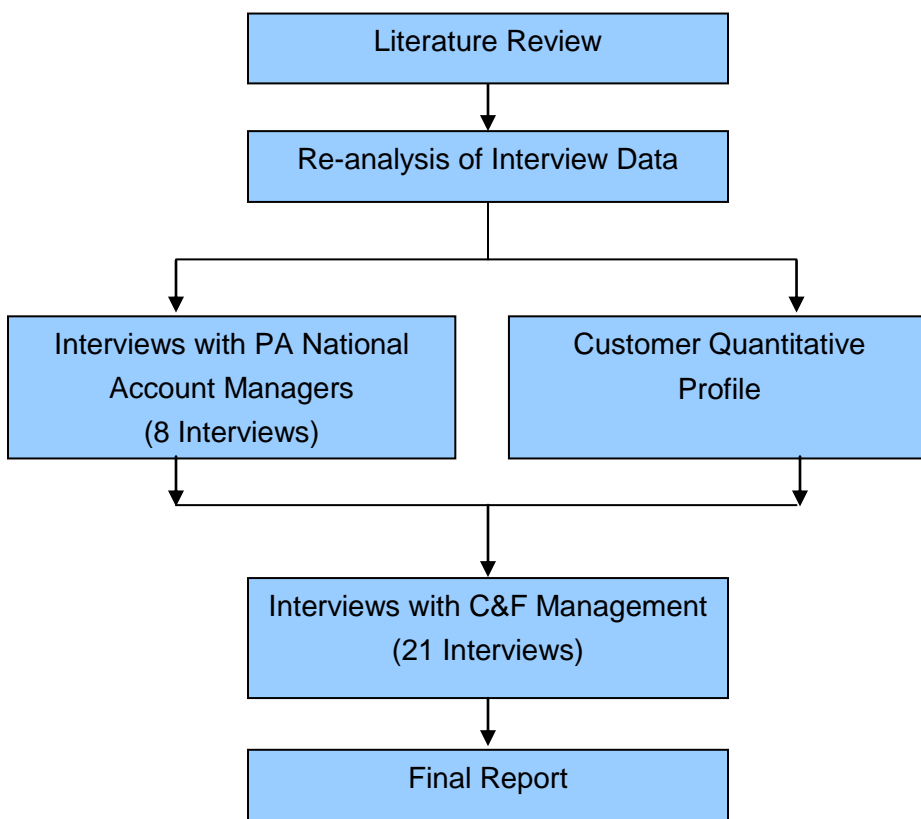
This section provides a high level synopsis of the Project 1B Team’s approach to characterizing the C&F market in Massachusetts.

In conducting this characterization of the C&F market, we defined C&F customers as follows:

- Both chains and franchises. In general, chains are businesses that share a brand and central management, and typically have standard business practices; examples include Walmart and Home Depot. In contrast, franchises are independently owned but share the same brand; examples include McDonalds. While chains typically have a more centralized decision-making process than do franchises, both chains and franchises have a regional or national perspective.
- C&F businesses located in both newly constructed buildings and existing buildings.
- Both regional and national C&F customers.
- All C&F customers regardless of the size of the individual business location or the aggregated size of all locations in Massachusetts. However, C&F customers with more and/or larger locations will be emphasized in the research as they likely consume more energy.

Figure 2-1 provides the Phase One research agenda that was developed in accordance with the RFP and additional information and insights gained from the PAs and EEAC Consultants. The findings from the Phase One tasks will influence the scope of the Phase Two work, whose potential research activities were outlined in the 2010 LCIEC Project 1B Work Plan.²

**Figure 2-1: C&F Market Characterization-
Phase One Research Agenda**



The remainder of this section provides an overview of each research task.

²² Massachusetts Large Commercial and Industrial Evaluation Contractor (LCIEC). *Final Work Plan Project 1B Chain & Franchise Market Characterization*. Prepared for the Massachusetts Energy Efficiency Program Administrators. August 6, 2010.

2.2.1 Literature Review

The literature review incorporates findings from six studies of commercial building stock inventories and efficiency-related decision making that were conducted over the past 10 years. Two recent studies on national accounts prepared by PA Consulting Group for National Grid are especially informative on the C&F market. The 2006 *National Accounts Study: Customer Energy Efficiency Equipment Decision Making Process and Standard Practice* provides insight into the C&F customer decision-making process for energy efficient equipment, free-ridership and spillover rates, and standard lighting and HVAC design practice. The 2007 *National Accounts Study: HVAC Customer Energy Efficiency Equipment Decision Making Process and Standard Practice* examined new construction HVAC purchases for C&F participants in the 2006 Design2000plus Cool Choice program. In addition to the two National Grid studies, other reports were reviewed that provide supporting information regarding the C&F market.

2.2.2 Re-analysis of Interview Data

The primary objective of the re-analysis task is to obtain feedback regarding the level of past program influence on C&F locations in MA. The approach consisted of compiling and analyzing participant survey data from the evaluation of four NSTAR C&I programs between 2003 and 2007. These evaluations used a standardized method to estimate free-ridership and participant spillover based on survey results. The participants were weighted in order to allow for a uniform analysis and classified as C&F vs. non-C&F. Lastly, the free-ridership rates were computed and compared between C&F and non-C&F customers by market segment, year and measure type. In addition, the analysis compared indicators of energy efficiency activity, such as the adoption of energy efficiency policies and implementation of energy efficiency measures in other facilities.

2.2.3 Customer Quantitative Profile

A more complete understanding of the size and composition of the C&F market in Massachusetts is an important step to assessing the approaches necessary to work with these customers and achieve greater potential energy savings in this sector. The evaluation team was not aware of any single source of information or data that characterizes the C&F market in Massachusetts in its entirety. Therefore, the team analyzed data regarding Massachusetts businesses from two sources, Dun & Bradstreet and the F.W. Dodge Players' Database. This quantitative profile has two main objectives:

- Define and characterize the population of Massachusetts' C&F customers

- Develop sample of Massachusetts' C&F customers for conducting qualitative interviews

2.2.4 Interviews with PA National Account Managers

The objective of the national account manager interviews is to provide a solid foundation for understanding the market structure and decision-making process of the C&F customers in Massachusetts. Key topics explored in the interviews include C&F building characteristics, energy efficiency decision making, participation in energy efficiency programs, and free-ridership. In addition, these interviews served as a vehicle to obtain contact information for the C&F management interviews.

2.2.5 Interviews with C&F Management

The C&F management interviews are intended to provide insight and understanding into the decision-making process of C&F customers in Massachusetts. The sampling plan was developed based on key market segments identified in the quantitative profile. A total of 21 in-depth telephone interviews were completed in March and April of 2011. Due to the relatively small sample size, the interviews are not intended to be a statistical representation of the population of C&Fs, but rather to provide a qualitative representation of the attitudes, behaviors, and practices of C&F customers.

2.3 Organization of Report

The remainder of the Phase One report is organized as follows:

- **Section 3. Literature Review.** This section presents the findings from the literature review of six recent studies of commercial building stock inventories and efficiency-related decision making for national accounts and franchises.
- **Section 4. Re-analysis of Interview Data.** This section presents the findings of the re-analysis of interview data from past NSTAR commercial and industrial (C&I) impact evaluations in order to investigate potential differences in free-ridership rates of C&F and non-C&F program participants.
- **Section 5. Customer Quantitative Profile.** This section characterizes the size and composition of the population of Massachusetts' C&F customers.

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- **Section 6. Interviews with PA National Account Managers.** This section provides a solid foundation for understanding the decision-making process of the C&F customers in Massachusetts.
 - **Section 7. Interviews with C&F Management.** This section presents the results of the in-depth telephone interviews with C&F customers in order to provide a qualitative representation of the attitudes, behaviors, and practices of C&F organizations.
 - **Section 8. Conclusions and Suggestions for Future Research.** This section integrates the key findings of the various research tasks of the study and provides suggestions for Phase 2 research.
 - **Appendices**
 - A. Literature Review Sources
 - B. Additional NTGR results
 - C. National Account Manager Interview Guide
 - D. Customer Interview Guide

3. Literature Review

3.1 Introduction

This section presents the findings from the literature review. The review incorporates findings from six studies of commercial building stock inventories and efficiency-related decision making that were conducted over the past 10 years. These studies provide a fairly consistent view of the decision-making processes and criteria that chains and franchises apply to energy-efficiency improvements, as well as estimates of free-ridership and spillover associated with their participation in energy efficiency programs.

Two recent studies on national accounts prepared by PA Consulting Group for National Grid are especially informative on the C&F market. The 2006 *National Accounts Study: Customer Energy Efficiency Equipment Decision Making Process and Standard Practice* provides insight into the C&F customer decision-making process for energy efficient equipment, free-ridership and spillover rates, and standard lighting and HVAC design practice. This report was based on research conducted with participants of National Grid's 2005 Energy Initiative and Design 2000plus commercial and industrial (C&I) programs. The Energy Initiative program promoted efficient retrofit measures, while Design 2000plus encompassed new construction, renovation/remodeling, and replacement of failed equipment.³ The 2007 *National Accounts Study: HVAC Customer Energy Efficiency Equipment Decision Making Process and Standard Practice* examined new construction HVAC purchases for C&F participants in the 2006 Design2000plus Cool Choice program.

In addition to the two National Grid studies, other reports were reviewed that provide supporting information regarding the C&F market. The findings drawn from these reports are cited in this section.

³ Both the Energy Initiative and Design 2000plus programs promoted efficient lighting and HVAC measures; however, in 2005 the majority of Energy Initiative projects were lighting retrofits, whereas nearly one-half of the Design 2000plus projects included HVAC measures. Therefore, findings from this study regarding lighting purchases can be differentiated between retrofit and new construction, whereas HVAC findings are based predominantly on new construction projects.

3.1.1 Summary

The following paragraphs summarize the key findings we identified through the literature review:

- Energy departments within C&Fs are the most influential stakeholders in equipment purchase decisions, although it is usually the administrative department that has the final decision for retrofit projects.
- Customers' energy departments tend to be small (1–3 individuals) with more business administrators than technical staff. The exceptions to this are grocery chains, which tend to have larger and more sophisticated internal staff—probably related to their high energy intensity.
- Product presentation and sales are more important to chains and franchises than energy efficiency.
- Chains and franchises generally require a payback period of two years or less for investments in energy efficiency.
- All interviewees stressed the importance of energy efficiency rebate programs in making energy efficient projects possible in their organizations, specifically in selling energy projects to upper management.
- National accounts report they have limited budgets for energy efficiency projects. Therefore, they are much more aggressive in implementing energy efficient retrofit projects in regions with good rebate programs.
- Free-ridership for new construction lighting purchases is significantly lower for chains and franchises than for other commercial customers, though spillover is roughly similar.
- Free-ridership for new construction HVAC is significantly higher for chains and franchises than for other commercial customers, though spillover is similar.

**Table 3-1: Free-ridership and Spillover Rates-
for Chains and Franchises, 2005 Energy Initiative and Design 2000plus Programs⁴**

	New Construction Lighting		New Construction HVAC	
	Chains & Franchises (n=16)	All Other Commercial (n=59)	Chains & Franchises (n=54)	All Other Commercial (n=117)
kWh Weighted Free-ridership	16%*	43%	79%*	38%
kWh Weighted Spillover	11%	5%	5%	4%

Statistically significant differences between “Chains & Franchises” and “All Other Commercial” are noted with an asterisk (*) at the 95% +/-5% confidence level.

3.2 Equipment Purchase Decisions

The objectives of the 2006 National Accounts Study included understanding the decision-making process for lighting and HVAC purchases by national accounts (i.e. chains and franchises), identifying key factors for going forward with energy projects, and assessing the effects of energy efficiency programs on C&F purchases. Interviews were conducted with individuals who had experience working on energy efficiency projects at C&Fs. Respondents were asked to:

- Identify the people at the company who developed equipment specifications;
- Identify the individuals or departments that made final decisions concerning equipment specifications;
- Identify the criteria applied in selecting equipment and specifications;
- Characterize those specifications as national versus local standards;
- Characterize the role and importance of energy efficiency incentive programs in equipment selection; and
- Characterize standard practices in equipment selection.

⁴ PA Consulting. *National Accounts Study: Customer Energy Efficiency Equipment Decision Making Process and Standard Practice-Final*. Prepared for National Grid, September 8, 2006.

Eleven respondents were interviewed in total, representing 14 unique companies that participated in either the 2005 Design 2000plus or Energy Initiative programs. Due to the small sample sizes, the interview results are primarily qualitative.

Key findings regarding equipment purchase decisions from the 2006 National Accounts study, supplemented with findings from other reports, are summarized below.

3.3 Energy Decision-making Process

- For the most part, energy decisions are made at the national headquarters for grocery, lodging, restaurant, and retail chains (Table 3-2). For healthcare chains, decision-making is most often split between headquarters and individual locations.

Table 3-2: Location of Decision Making⁵

Location of decision-making	Percent of National Floor Space				
	Healthcare	Grocery [^]	Lodging	Restaurant	Retail
National HQ	23%	48%	69%	65%	84%
Individual Locations	19%		9%	4%	
Regional HQ	3%	14%	7%	4%	
Split Responsibility	56%		15%	27%	15%

[^]Column percentages do not sum to 100% because the data is for *national* grocery chains only.

- National accounts have various stakeholders involved in the management and implementation of energy efficiency projects. These include internal energy staff, outside contractors, and equipment manufacturers.
- The influence of the customer’s energy department on customer decision-making process cannot be overstated. Internal energy staff members are most influential in the decision to go ahead with retrofit projects. However, outside energy service providers tend to play a greater role in new construction in the design and construction phase.
- Within national accounts, internal energy staff and/or third party energy service providers work closely with facility managers, financial departments, procurement departments

⁵ Opinion Dynamics Corporation. *Commercial Market Segmentation Study*. Gas Research Institute / American Gas Association. 1998. As cited in: Energy and Environmental Analysis. *National Account Sector Energy Profiles*. Submitted to Oak Ridge National Laboratory. April 2003. The study interviewed decision-makers responsible, nationwide, for nearly 3,000 healthcare facilities, over 20,000 grocery stores, almost 7,000 lodging facilities, over 41,000 restaurants, and over 31,000 retail stores.

and upper management in getting approval for and implementing projects. In most cases, it is another administrative department within the company that runs the financial analysis that determines if a project can move forward or not.

- Table 3-3 displays the most important decision-maker for a variety of national account sectors; some sectors are disaggregated by chains with centralized decision-making structure vs. chains with decisions made at individual locations. For the healthcare, grocery, and lodging sectors, about one-half of the respondents list engineering as the lead decision-maker. For the restaurant and retail sectors, the lead decision-maker is split between maintenance/facility management and senior management or owners.

Table 3-3: Most Important Energy Decision Maker⁶

Most important decision maker	Percent of National Floor Space							
	Healthcare		Grocery	Lodging		Restaurant		Retail
	Cen. DM	Ind. DM		Cen. DM	Ind. DM	Cen. DM	Ind. DM	
Engineering	47%	52%	50%	42%	48%			7%
Maint. & Construction			17%			9%	6%	33%
Facility Management	15%	20%	13%	36%	17%	42%	21%	35%
Senior Management	8%	9%	10%	16%	12%	32%	25%	25%
Owner				6%	19%	7%	38%	
Purchasing	16%	2%						

- Customers' energy departments tend to be small (1–3 individuals) with more business administrators than technical staff. The exceptions to this are grocery chains, which tend to have larger and more sophisticated internal staff—probably related to grocery stores' high energy intensity.⁷ In addition, interviews with facility managers for grocery chains in

⁶ Opinion Dynamics Corporation. *Commercial Market Segmentation Study*. Gas Research Institute / American Gas Association. 1998. As cited in: Energy and Environmental Analysis. *National Account Sector Energy Profiles*. Submitted to Oak Ridge National Laboratory. April 2003. The study interviewed decision-makers responsible, nationwide, for nearly 3,000 healthcare facilities, over 20,000 grocery stores, almost 7,000 lodging facilities, over 41,000 restaurants, and over 31,000 retail stores.

⁷ Among a dozen commercial building types analyzed in the Pacific Northwest, grocery stores were found to have the highest electric energy use intensity, followed closely by restaurants. KEMA-XENERGY.

the Pacific Northwest identified a significant degree of concern about energy and implementation of energy-saving practices. However, these respondents reported that integration of energy management into day-to-day activities was incomplete.⁸

- All of the interviewed national accounts work with third party contractors, such as energy service companies, to some extent. In addition, HVAC manufacturers were also identified as key stakeholders influencing national accounts' energy efficiency decision process.
- Grocery chains may not fall in a continuous spectrum of interest in energy efficiency, rather they may tend to be clustered at either the “low” or “high” orientation towards energy efficiency.⁹

3.4 Key factors in Energy Decision Making

- The primary deciding factor for national accounts moving forward with projects is the project payback. The majority of national accounts reported that they needed a project payback of two years or less to move forward. Other key factors reported by at least one interviewee were total life cycle costs, cost of ownership (operating costs, initial cost and maintenance cost), equipment warranties, and longevity of equipment.
- The majority of organizations, particularly those with centralized decision-making, have established equipment selection guidelines (Table 3-4). The most common factors considered are lowest operating cost, lowest purchase cost, and vendor recommendations, though this varies by sector and decision-making structure.

Assessment of the Commercial Building Stock in the Pacific Northwest. Prepared for Northwest Energy Efficiency Alliance. March 8, 2004.

⁸ Research Into Action. *Better Bricks Grocery Initiative: Market Progress and Evaluation Report #3.* Prepared for Northwest Energy Efficiency Alliance. February 15, 2008.

⁹ *ibid.*

Table 3-4: Equipment Selection Guidelines¹⁰

Equipment Selection Guidelines	Percent of National Floor Space							
	Healthcare		Grocery	Lodging		Restaurant		Retail
	Gen. DM	Ind. DM		Gen. DM	Ind. DM	Gen. DM	Ind. DM	
<i>Guidelines in Place</i>	74%	56%	74%	48%	50%	75%	47%	73%
Lowest operating cost	37%	13%	55%	29%	19%	38%	14%	21%
Lowest purchase cost	37%	13%	44%	50%	29%	27%	14%	26%
Payback	16%	2%	13%	1%	12%	9%	2%	
Preferred Vendor	6%	39%		9%	14%	23%	19%	17%
Return on Investment			25%	7%	16%	7%	7%	
Replace with like equipment	1%	7%	9%	5%	9%	14%	10%	
Meet Gov't Req.	2%	9%						
Meet Corp. Specs	1%	24%						

- The importance of being able to “duplicate” energy efficiency projects at other locations is a key factor for national accounts.
- Social responsibility or being a good corporate citizen was also reported as important to national accounts, although some were not sure how best to market this to customers.
- Product presentation and ambience are key factors for lighting projects. Several interviewees indicated that they do not employ higher efficiency lighting technology if they believe that it will compromise product presentation. A study of grocery stores in which respondents were asked to rank the importance of equipment attributes in purchase decisions confirms the importance of product presentation in equipment purchase decisions by C&Fs. This study reported that large chains ranked

¹⁰ Opinion Dynamics Corporation. *Commercial Market Segmentation Study*. Gas Research Institute / American Gas Association. 1998. As cited in: Energy and Environmental Analysis. *National Account Sector Energy Profiles*. Submitted to Oak Ridge National Laboratory. April 2003. The study interviewed decision-makers responsible, nationwide, for nearly 3,000 healthcare facilities, over 20,000 grocery stores, almost 7,000 lodging facilities, over 41,000 restaurants, and over 31,000 retail stores.

appearance/contribution to sales highest, above all other attributes including reliability, energy efficiency, costs, and maintenance.¹¹

3.5 The Role and Effects of Energy Efficiency Programs

- All interviewees stressed the importance of energy efficiency rebate programs in making energy efficient projects possible in their organization, specifically by selling energy projects to upper management. They were unanimous in their opinion that without the programs, significantly fewer projects would be implemented.
- Program technical assistance plays a key role in the decision to install high efficiency projects.
- National accounts report they have limited budgets for energy efficiency projects. Therefore, they are much more aggressive in implementing energy efficient retrofit projects in regions with good rebate programs.
- For national accounts that have a significant percentage of their stores in malls, energy efficiency programs face barriers that limit their participation. These barriers include the lack of submeters and the presence of centralized air conditioning units.

The 2007 National Accounts Study had several objectives, including determining whether C&Fs were purchasing Consortium for Energy Efficiency (CEE) Tier 2 or higher HVAC equipment (Cool Choice eligible) without a program rebate, and determining the levels of free-ridership and spillover for HVAC for C&F participants in the 2006 Design 2000plus program. Unlike the 2006 National Accounts study, C&F representatives were not interviewed directly for the 2007 National Accounts study. Rather, the 2007 study relied on interviews with HVAC supply chain market actors to address these issues. Due to the small sample sizes, the interview results are primarily qualitative. The key findings from this study are as follows.

- National accounts' new construction HVAC equipment decisions are mainly made at the national level, with some regional variations. Regional chains make more decisions locally.

¹¹ Quantum Consulting Inc., *Market Assessment of the Independently Owned Retail Food Sector in the Pacific Northwest*. Prepared for CARES, December 2000.

- Energy efficiency programs influence national accounts' HVAC retrofit projects. National accounts choose to spend their limited capital budget to do discretionary retrofits at stores where there are programs.
- Corporate culture is the largest barrier for nonparticipating national accounts. HVAC manufacturers report that some national accounts' corporate culture is to always choose the least-expensive equipment.
- National accounts with leased-space face additional barriers to increased HVAC efficiency. Many national accounts occupy leased space in malls and strip malls where building owners have no incentive to install more efficient equipment when the tenants pay the bills. However, some vendors feel strongly that national accounts have enough sway with landlords to demand high-efficiency equipment.

3.6 Free-ridership & Spillover

Free-ridership surveys were conducted for national accounts that participated in the 2005 Design 2000plus program or Energy Initiative program.¹² Free-ridership (FR) and spillover (SO) estimates were determined for the 2006 Design 2000plus Cool Choice program by means of interviews with six individuals representing national accounts. Two years of data collection for the Design 2000plus program allowed for the comparison between program years 2005 and 2006, although the sample size for the 2006 participants is substantially smaller.

3.6.1 Lighting

Table 3-5 displays the free-ridership and spillover rates estimated from the free-ridership survey for participants in the 2005 Design 2000plus program. The free-ridership and spillover rates presented in Table 3-5 represent lighting purchases for new construction. Rates are presented both at the customer level (average free-ridership) and weighted by annual kWh savings. Statistically significant differences between national accounts and all other C&I participants are noted with an asterisk (*) at the 95 percent +/-5 percent confidence level. National accounts were found to have a significantly lower free-ridership rate for new construction lighting purchases than all other C&I participants. While spillover rates were slightly higher for national

¹² PA Consulting. *2005 Commercial and Industrial Programs Free-ridership and Spillover Study Revised*. Prepared for National Grid, Cape Light Compact, and United Illuminating, September 1, 2006.

accounts than other participants in the Design 2000plus program, this difference is not statistically significant.

**Table 3-5: Free-ridership and Spillover Estimates-
for New Construction Lighting 2005 Design 2000plus Program¹³**

	National Accounts (N=16)	All Other Commercial & Industrial Participants (N=59)
Average Free-ridership	17%*	32%
Average Spillover	8%	5%
Gross kWh Savings	2,760,091	2,376,841
kWh Weighted Free-ridership	16%*	43%
kWh Weighted Spillover	11%	5%

Statistically significant differences between national accounts and all other C&I participants are noted with an asterisk (*) at the 95% +/- 5% confidence level.

Table 3-6 displays the free-ridership and spillover rates estimated for participants in the 2005 Energy Initiative program for lighting retrofit projects. None of the three national accounts were free riders compared to 12 percent of all other participants. In addition, there was no spillover among the three C&F participants, compared to seven percent of other participants. Note, however, that none of the differences in FR/SO rates are statistically significant.

¹³ PA Consulting. *National Accounts Study: Customer Energy Efficiency Equipment Decision Making Process and Standard Practice-Final*. Prepared for National Grid, September 8, 2006.

**Table 3-6: Free-ridership and Spillover Estimates for Retrofit Lighting-
2005 Energy Initiative Program¹⁴**

	National Accounts (N=3)	All Other Commercial & Industrial Participants (N=85)
Average Free-ridership	0%	12%
Average Spillover	0%	7%
Gross kWh Savings	1,679,290	16,716,770
kWh Weighted Free-ridership	0%	7%
kWh Weighted Spillover	0%	1%

3.6.2 HVAC

New construction HVAC purchases made through the 2005 Design 2000plus program were classified as unitary and non-unitary in the 2006 National Accounts study. Table 3-7 shows that in comparison to all other 2005 participants, national accounts had a significantly higher free-ridership rate for both unitary and non-unitary HVAC equipment. While average spillover was significantly higher for national account purchases of unitary HVAC than for all other participants, there was no difference in spillover between the two groups when weighted for kWh savings.

¹⁴ PA Consulting. *National Accounts Study: Customer Energy Efficiency Equipment Decision Making Process and Standard Practice-Final*. Prepared for National Grid, September 8, 2006.

**Table 3-7: Free-ridership and Spillover Estimates-
for New Construction HVAC, 2005 Design 2000plus Program¹⁵**

	Unitary HVAC		Non-Unitary HVAC	
	National Accounts (N=33)	All Other Participants (N=68)	National Accounts (N=21)	All Other Participants (N=49)
Average Free-ridership	51%*	32%	65%*	23%
Average Spillover	30%*	3%	0%	1%
Gross kWh Savings	592,305	782,655	187,287	432,852
kWh Weighted Free-ridership	80%*	39%	76%*	37%
kWh Weighted Spillover	7%	6%	0%	0%

Statistically significant differences between national accounts and all other C&I participants are noted with an asterisk (*) at the 95% +/- 5% confidence level.

¹⁵ PA Consulting. *National Accounts Study: Customer Energy Efficiency Equipment Decision Making Process and Standard Practice-Final*. Prepared for National Grid, September 8, 2006.

Free-ridership and spillover estimates were determined for the 2006 Design 2000plus Cool Choice program by means of interviews with six individuals representing national accounts (Table 3-8). Free-ridership and spillover estimates based on the 2005 survey of Design 2000plus participants are also provided in Table 3-8 to allow for the comparison of FR/SO rates between 2005 and 2006.

National accounts' free-ridership rates declined between the two program years; weighted FR rates decreased from 79 percent in 2005 to 45 percent in 2006. The decrease in the FR rate is mainly due to changes in the roster of firms that participated in the program; there were two major national accounts that were partial or complete free-riders in 2005 that did not participate in 2006. These two participants combined accounted for over half of the C&F kWh savings in 2005. Again the results for the 2006 program should be viewed with caution due to small sample sizes (six customers and 15 measures).

**Table 3-8: Free-ridership and Spillover Estimates-
for New Construction HVAC, Design 2000plus Program¹⁶**

		National Accounts	All Other Commercial & Industrial Participants
2005 HVAC Unitary and Non-Unitary	<i>Sample size</i>	N=54	N=117
	Average Free-ridership	56%	29%
	Average Spillover	19%	2%
	Gross kWh Savings	779,592	1,215,507
	kWh Weighted Free-ridership	79%	38%
	kWh Weighted Spillover	5%	4%
2006 HVAC Unitary and Non-Unitary	<i>Sample size</i>	N=15	--
	Average Free-ridership	27%	--
	Average Spillover	7%	--
	Gross kWh Savings	69,437	--
	kWh Weighted Free-ridership	45%	--
	kWh Weighted Spillover	2%	--

In order to address the small sample size for the 2006 new construction HVAC FR/SO rates, an additional free-ridership calculation was performed in which 2005 FR numbers were applied to

¹⁶ PA Consulting. *National Accounts Study: HVAC Customer Energy Efficiency Equipment Decision Making Process and Standard Practice-Final Report*. Prepared for National Grid, July 5, 2007.

2006 participants who were surveyed in 2005 but not 2006. This approach assumes that FR rates for these participants remained consistent between 2005 and 2006. However, it allows for a larger sample size. The free-ridership rate estimated by this method (47 percent) is only slightly higher than the 45 percent figure estimated for the sample size of 15 businesses (Table 3-9).

**Table 3-9: Free-ridership Estimate-
for New Construction HVAC Using 2005 Free-ridership Rates
for Non-interviewed 2006 Participants¹⁷**

	National Accounts
<i>Sample size</i>	<i>N=90</i>
Gross kWh Savings	558,869
kWh Weighted Free-ridership	47%

3.7 Standard Practices

Both the 2006 and 2007 National Accounts reports sought to identify standard practices by chains and franchises for lighting and HVAC technologies. The findings from the studies from both reports are summarized below.

3.7.1 Lighting

- In the absence of energy efficiency programs, lighting standard practice for the majority of national accounts has evolved toward higher efficiency—standard T-8 fluorescent tubes; high intensity discharge lamps (HIDs) for track and accent lighting and metal halides with electronic ballasts for high bay applications.¹⁸ When a rebate is available, many national accounts said their standard practice is to use T-5 fluorescent tubes to light high bay spaces.
 - The Mass Save program currently offers incentives for high performance or reduced wattage T-8 and T-5 lamps and ballasts for retrofit projects and high

¹⁷ PA Consulting. *National Accounts Study: HVAC Customer Energy Efficiency Equipment Decision Making Process and Standard Practice-Final Report*. Prepared for National Grid, July 5, 2007.

¹⁸ Note that the Project 1A High Bay Lighting Market Effect Study found that metal halides with electronic ballasts may not be the most efficient option in Massachusetts.

performance or reduced wattage T-8 and T-5 fixtures for new construction projects. Pulse start metal halide lamps/fixtures with electronic ballasts are offered only for retrofit projects.

- Industry standard for retailers is to double the lighting power density in stores because research shows there is a direct correlation between sales and illumination.

3.7.2 HVAC

- National accounts' standard efficiency levels for new construction HVAC tend to be slightly higher than the commercial market standard practice for HVAC equipment of 20 tons or less. HVAC suppliers report that national accounts' standard efficiency ranges from 10.5 to 11.0 EER, and that the majority of national accounts have a standard practice of 11.0 EER for equipment less than 20 tons. National accounts with smaller stores may go with 10.5 EER.
 - Mass Save currently offers incentives for 11.5 EER (Level 1) unitary AC systems between 5.4 and 20 tons.
- For HVAC equipment 5 tons and under, national accounts' standard practice is 13.0 SEER. The minimum efficiency requirement for equipment under 5.4 tons in Mass Save programs is currently 14.0 SEER.
- For larger HVAC equipment, over 20 tons, national accounts' standard practice is reported to be 10.5 EER. The minimum efficiency requirement for equipment between 20 and 63 tons in Mass Save programs is currently 10.5 EER, while equipment over 63 tons must meet a minimum of 9.7 EER.
- National accounts report that they are not buying 11.5 EER or 14.0 SEER and up because the premium efficiency equipment is not cost-effective.

4. Re-Analysis of Interview Data

4.1 Introduction

This section presents the findings of the re-analysis of interview data. KEMA analyzed past NSTAR commercial and industrial (C&I) impact evaluation interview data to investigate potential differences in free-ridership rates of C&F and non-C&F program participants. The PAs and EEAC directed KEMA to restrict the analysis to NSTAR data because the NSTAR data was available via impact evaluation work KEMA has performed for NSTAR. The NSTAR C&I population may differ from the rest of Massachusetts and the samples would have been designed differently if the intent of the NSTAR studies was to calculate and compare free-ridership rate for C&F and non-C&F. However, the re-analysis of the NSTAR data provides interesting looks at C&F free-ridership based on existing data.

This section is organized as follows:

- **Approach:** description of the analysis approach, including a review of available data sources, definition of C&F businesses, and an explanation of the analytic methodology.
- **Re-analysis Results:** presentation of the free-ridership results by:
 - C&F vs. Non-C&F;
 - C&F vs. Non-C&F by Measure Type (Lighting vs. Other End Uses); and
 - C&F vs. Non-C&F by Market Segment (Healthcare, Grocery, Retail, and Other).
- **Customer Decision-Making Questions:** each NSTAR impact evaluation interview included a series of questions regarding company-wide energy efficiency policies. Under the direction of the PAs, KEMA added an analysis of these data to the re-analysis task within the existing budget. This analysis further investigates the decision-making practices of C&F that may lead to more or less energy efficiency program free-ridership.
- **Conclusions:** in the last section, KEMA provides conclusions based on this task.

Although the focus on this analysis is on free-ridership rates, KEMA also provides participant spillover and net to gross ratio (NTGR) results in Appendix B.

4.2 Approach

KEMA's approach to assessing the difference in net impacts indicators between C&F customers and other commercial customers consisted of the following basic steps:

1. Compile the results of participant surveys fielded for evaluations of four commercial and industrial programs conducted during the years 2003 – 2007. These evaluations used a standardized method to estimate free-ridership, participant spillover, and non-participant spillover based on survey results.
2. Use information from the four C&I evaluation reports list Table 4-1 to calculate the weights of the sample observations so that data from the four studies could be analyzed in a uniform fashion.
3. Classify individual observations as C&F or non-C&F customers based on information in the surveys.
4. Compute and compare free-ridership rates for C&F and non-C&F customers for the combined sample as a whole. Compute and compare free-ridership rates for C&F and non-C&F customers or projects grouped by building type, year, and measure type.
5. Compute and compare indicators of energy efficiency activity, such as the adoption of energy efficiency policies and implementation of energy efficiency measures in other facilities among C&F and non-C&F facilities, as well as among subgroups defined by building type.

In the subsections below we provide more detailed descriptions of the aforementioned five analytic steps.

- 1. Compile data from previous studies.** KEMA has conducted four impact evaluations of NSTAR's large commercial and industrial energy efficiency programs since 2004. Table 4-1 presents the program year, study title, types of measures covered, and the total samples size for the four studies. The 2004 and 2005 study samples contained a mix of end use measures, including lighting. The 2006 study included no lighting, while the 2007 study only covered lighting measures.

Table 4-1: NSTAR Source Data

Program Year	Study Title	Types of Measures	Sample Size
2004	NSTAR Construction and Business Solutions: 2004 Program Impact Evaluation Final Report	Lighting and non-lighting measures	122
2005	NSTAR Electric & Gas Business & Construction Solutions (BS/CS) Programs: Monitoring & Verification 2005 Final Report	Lighting and non-lighting measures	115
2006	NSTAR Electric & Gas Business & Construction Solutions (BS/CS) Programs: Monitoring & Verification 2006 Final Report	Only non-lighting	99
2007	2007 Business & Construction Solutions - NSTAR Electric and Gas: Measurement and Verification of 2007 Lighting Measures	Only Lighting	80

2. Calculate weights to support consistent estimates. The statistical technique used to estimate Free-ridership and Participant Spillover rates and NTGR for each of the new subsets (e.g. C&F and non-C&F) is called domains analysis. This method relies on the fact that each sample customer represents a fixed number of population customers, which is determined by their assignment to a stratum at the time of the sample design and selection. KEMA reviewed the four C&I evaluation reports listed in Table 4-1Table to calculate the same weights used in the original analyses. The stratum-based weight that each sample customer carries into the new domains allows us to estimate each ratio (i.e. Free-ridership, Participant Spillover, NTGR) for each segment of the new subsets of the population. Standard formulas also produce error bounds and relative precisions around the ratios, which inform the t-test that tells us whether differences are statistically significant.

The samples supporting the NSTAR studies were designed to produce the most reliable estimates of Free-ridership, Participant Spillover and Net-to-Gross Ratios for the overall populations of projects in each year. If the intent of the NSTAR studies was to estimate energy savings ratios by C&F vs. non-C&F classification then the samples for these studies would have been designed differently.

Once we started analyzing the data by group (e.g. C&F and non-C&F), it became clear that there were insufficient sample points in the individual years to produce statistically

reliable estimates. Therefore, the samples for the four years were combined to produce more robust results for the domains analysis. The re-analysis results in are provided for the individual years and combined across years.

3. Classify sample participating customers as C&F or non-C&F. The criteria that were applied to identify C&F customers are as follows:

- C&Fs are businesses that share a brand and central management, and typically have standard business practices, e.g. Wal-Mart.
- Franchises are independently owned by share the same brand, e.g. McDonalds.
- Businesses can have a regional or national perspective.
- May be located in both newly constructed and existing buildings.
- Includes small and large locations.

The sample customers included in the NSTAR studies were identified as C&F or non-C&F based on their name, and grouped into the following segments:

- Healthcare (e.g. Aspen Dental, Planned Parenthood),
- Grocery (e.g. Shaw's Supermarkets, Stop & Shop),
- Lodging (e.g. Best Western, Holiday Inn),
- Restaurant (e.g. Dunkin Donuts, McDonalds), and
- Retail (e.g. CVS, Radio Shack).

These market segments were identified in the studies included in the Literature Review. Table 4-2 and Table 4-3 provide the distribution of the sample by number of customers and annual program tracked kWh savings across the segments and study years, respectively. Overall C&Fs account for 20 percent of total sampled customers and 19 percent of program tracked kWh savings in the sample. We do not know if this is representative of the NSTAR population and furthermore the Massachusetts large C&I population. However, it is reasonable to infer that the C&F market is an important market segment worthy of consideration.

**Table 4-2: Distribution of 2004-2007-
Sample Projects by C&F Classification**

Study	Market Segment					Totals	
	Grocery	Healthcare	Lodging	Restaurant	Retail	C&F	Non-C&F
2004	6	5	1	0	7	19	103
2005	14	12	0	2	6	34	81
2006	1	8	1	0	4	14	85
2007	3	5	0	0	10	18	62
Total	24	30	2	2	27	85	331

**Table 4-3: Distribution of 2004-2007-
Sample Program Tracked kWh by C&F Classification**

Study	Market Segment					Totals	
	Grocery	Healthcare	Lodging	Restaurant	Retail	C&F	Non-C&F
2004	11,893,442	5,591,687	307,085	0	667,889	18,460,103	51,498,928
2005	2,172,001	3,036,058	0	5,029	1,774,099	6,987,187	31,397,390
2006	13,915	1,984,696	118,409	0	262,749	2,379,769	39,153,162
2007	564,141	2,402,502	0	0	2,835,040	5,801,683	18,465,183
Total	14,643,499	13,014,943	425,494	5,029	5,539,777	33,628,742	140,514,663

- 4. Compute free-ridership rates and other net impacts indicators.** Since 2003, the assessment of net program effects for C&I programs in Massachusetts has been performed in accordance with the Massachusetts electric PAs’ joint study titled, *Standardized Methods for Free-Ridership and Spillover Evaluation* (Standardized Methods report).^{19,20} The Standardized Methods report provides guidelines and methodology for the estimation of Participant “Like” Spillover, Non-Participant Spillover and Participant Free-ridership. The NTGR is a metric of program influence on the adoption of energy efficiency measures that incorporates Free-ridership and Participant Spillover.²¹ The interview data analysis was restricted to NSTAR evaluations conducted by KEMA since the introduction of the Standard Methods in 2003.

¹⁹ National Grid, NSTAR Electric, Northeast Utilities, Unitil, Cape Light Compact. Standardized Methods for Free-Ridership and Spillover Evaluation-Task 5 Final Report (Revised). June 16, 2003.

²⁰ The authors of this report assume the reader is familiar with the Standardized Methods report.

²¹ Non-participant spillover is not included in this analysis because it was out of the scope of the NSTAR impact evaluations used as source data for this analysis.

A standard set of interview questions was used to capture Free-ridership and Participant Spillover impacts. The NSTAR data collected during program years 2003 through 2007 includes kWh savings information for each project as reported by the PA in the program tracking system; and evaluation adjusted gross savings that reflects any corrections or adjustments made to the program tracking estimate via an engineering review of paperwork and site visits. The effects of Free-ridership and Participant Spillover are estimated from responses to survey questions and applied to the adjusted gross savings to determine the NTGR for each project. Free-ridership is the focus of this section; however Participant Spillover rates and Net-to-Gross Ratios are presented in Appendices A and B respectively, without further discussion.

5. Disaggregate results by subgroups of participants. Finally, the sample data were used to estimate ratios for the following segments:

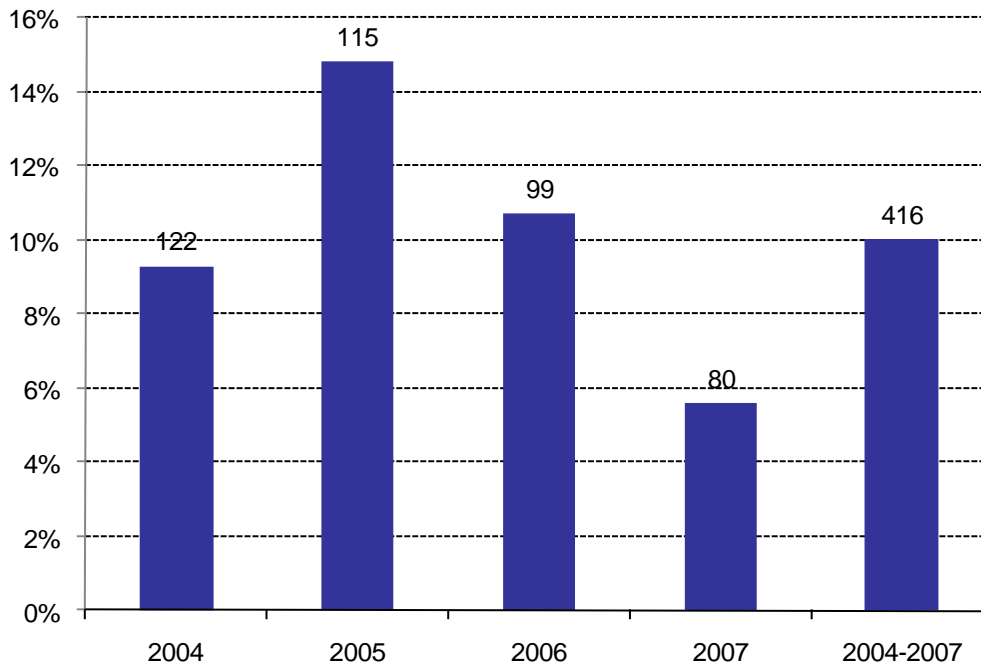
- C&F vs. Non-C&F
- C&F vs. Non-C&F by Measure Type (Lighting vs. Other End Uses); and
- C&F vs. Non-C&F by Market Segment (Healthcare, Grocery, Retail, and Other).

4.3 Results of the Original Analysis

Figure 4-1 presents the overall results of the analysis of Free-ridership rates for the individual years, as reported in the original studies, and the combination of the four studies. These results provide a useful point of reference for the re-analysis results presented in the next section.

In Figure 4-1, as well as all of the charts that follow, the number above each bar signifies the number of observations in the sample.

**Figure 4-1: NSTAR Free-ridership Results-
2004-2007**



In addition to the evaluation of differences in ratios between different segments of customers, we examined customer responses to the survey questions collected during interviews for each of the studies (2004-2007). The frequencies of responses, weighted based on the statistical sample design, are described in the Section 4.5 titled “Customer Decision-Making Questions.”

4.4 Re-Analysis Results

The results of the analyses of Free-ridership rates are presented in this section. The results are presented separately for:

- C&F vs. Non-C&F
- C&F vs. Non-C&F by Measure Type (Lighting vs. Other End Uses); and
- C&F vs. Non-C&F by Market Segment (Healthcare, Grocery, Retail, and Other).

KEMA provides a bar chart and table for each comparison. In the table, the statistical difference comparison indicates whether the observed difference is significant. In the chart, the number above each bar represents the sample size for each ratio. The level of statistical significance is expressed by the number of asterisks following the sample size.

KEMA also estimated the ratios for Summer KW and Winter KW savings. The demand results are not included in this report because they are similar to the kWh results. This is not surprising given that they are based on the same survey responses.

4.4.1 C&F vs. Non-C&F

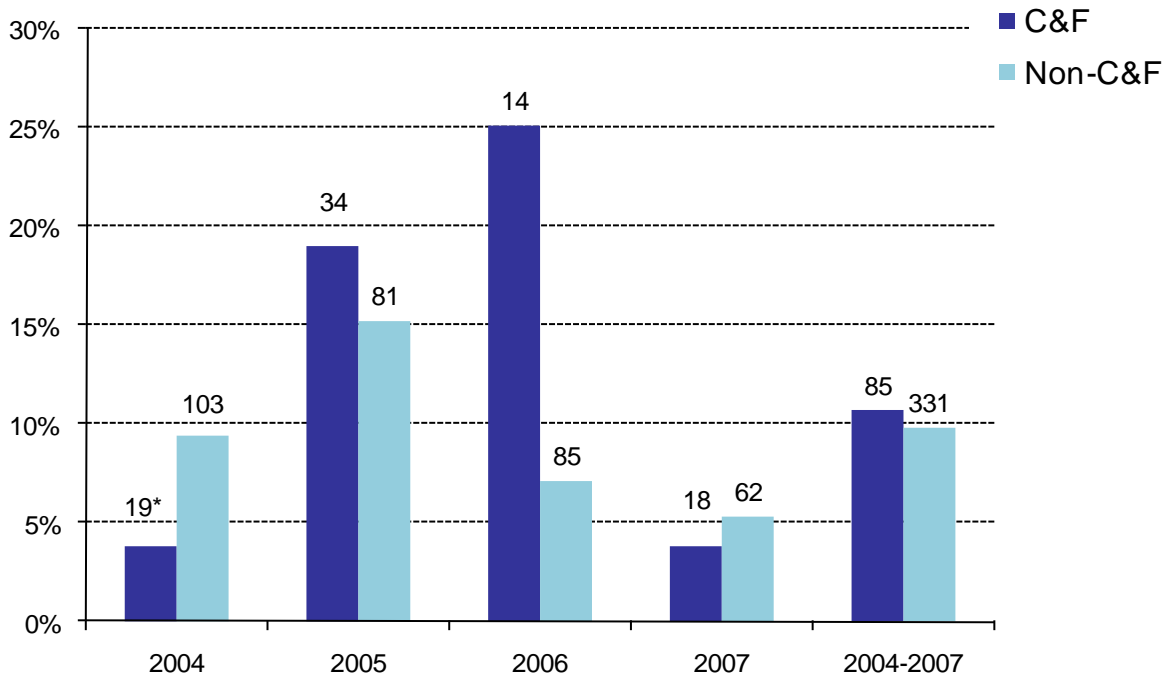
Results of the analysis of Free-ridership rates in each year, and for the four years combined, are provided in Figure 4-2 and Table 4-4. The results for the combined studies (2004-2007) are statistically similar. However a look at the individual studies shows a couple statistical differences. In year 2006, C&F customers had higher free-ridership rates than Non-C&Fs. The 18-percentage point difference, based on a sample including no lighting measures, is nearly significant at the 90 percent level. This result supports the findings of National Grid’s 2006 study that found higher free-ridership levels with C&Fs for HVAC measures. In 2004, the C&F free-ridership rate was lower than the Non-C&F group and significant at 93 percent level of confidence.

The 2005 and 2007 C&F vs. Non-C&F results were not statistically significant.

**Table 4-4: NSTAR Free-ridership Results-
2004–2007, C&F vs. Non-C&F**

Program year	C&F	Non-C&F	Diff	t-stat	Conf Level
2004	4%	9%	-6%	1.83	93%
2005	19%	15%	4%	0.48	37%
2006	25%	7%	18%	1.58	88%
2007	4%	5%	-1%	0.54	41%
2004-2007	11%	10%	1%	0.26	20%

**Figure 4-2: NSTAR Free-ridership Results-
2004–2007, C&F vs. Non-C&F**



* The C&F and Non-C&F results are statistically different from each other at the 90% level of confidence.

4.4.2 C&F vs. Non-C&F by Measure Type

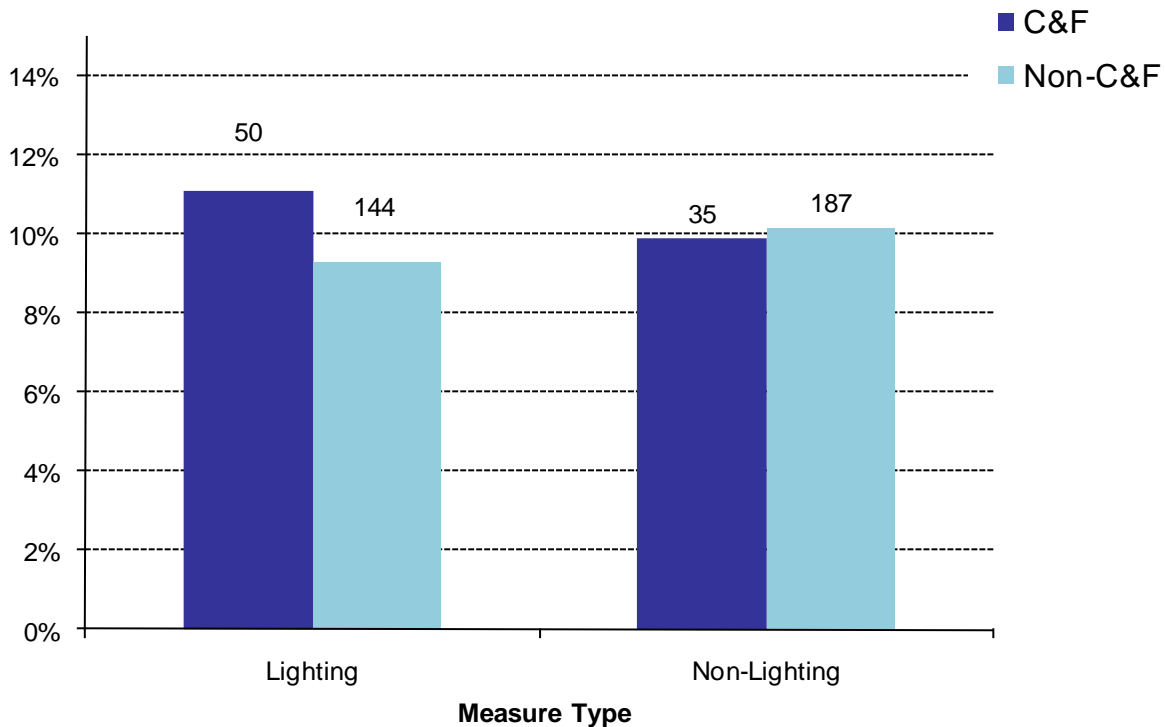
In an attempt to isolate the effects of different end-use technologies on Free-ridership rates, the C&F and Non-C&F groups were split between Lighting and Non-Lighting end uses. The measures included in the Non-Lighting group were: Refrigeration, HVAC, Industrial Processing, Motors, Compressed Air, and Variable Speed Drives.

The results of the measure type comparison using all four years of data are shown in Table 4-5 and Figure 4-3. There are no statistical differences between C&F and Non-C&Fs for lighting or non-lighting measures. These results are not consistent with those reported in the National Grid studies.

**Table 4-5: NSTAR Free-ridership Results-
2004–2007, C&F vs. Non-C&F by Measure Type**

Measure Type	C&F	Non-C&F	Diff	t-stat	Conf Level
Lighting	11%	9%	2%	0.38	30%
Non-Lighting	10%	10%	0%	0.07	5%

**Figure 4-3: NSTAR Free-ridership Results-
2004–2007, C&F vs. Non-C&F by Measure Type**



4.4.3 C&F vs. Non-C&F by Market Segment

Further analyses were performed to assess differences in Free-ridership rates by C&F market segment. Each C&F project was assigned to one of the following market segments: Retail, Health Care, Grocery, Lodging and Restaurants. Due to the small number of projects in the last two market segments (Lodging and Restaurants) these were combined and reported as Other C&F. Each C&F market segment free-ridership rate was compared to that of the overall Non-C&F group. Table 4-6 and Figure 4-4 present these results.

All C&F market segment free-ridership rates were significantly different than the Non-C&F segment. This is not surprising since each is being compared to the overall Non-C&F group, which represents a diverse mix of businesses.

The free-ridership rates were much lower for Health Care and Grocery than for Retail and Other C&F businesses. This is an interesting result for several reasons:

- First, as reported in Table 4-3 Health Care and Grocery account for 82 percent of C&F kWh program tracked savings.
- Second, energy costs likely account for larger fractions of operating costs for Health Care and Grocery compared to other C&F market segments.²²
- Third, for Health Care and Grocery, about one-half of the respondents list engineering as the lead decision-maker. For the restaurant and retail sectors, the lead decision-maker is split between maintenance/facility management and senior management or owners.²³
- And lastly, the location of the decision maker is more likely to be at a national headquarters for other C&F market segments than Health Care and Grocery.²⁴

**Table 4-6: NSTAR Free-ridership Results-
2004–2007, C&F vs. Non-C&F by Market Segment**

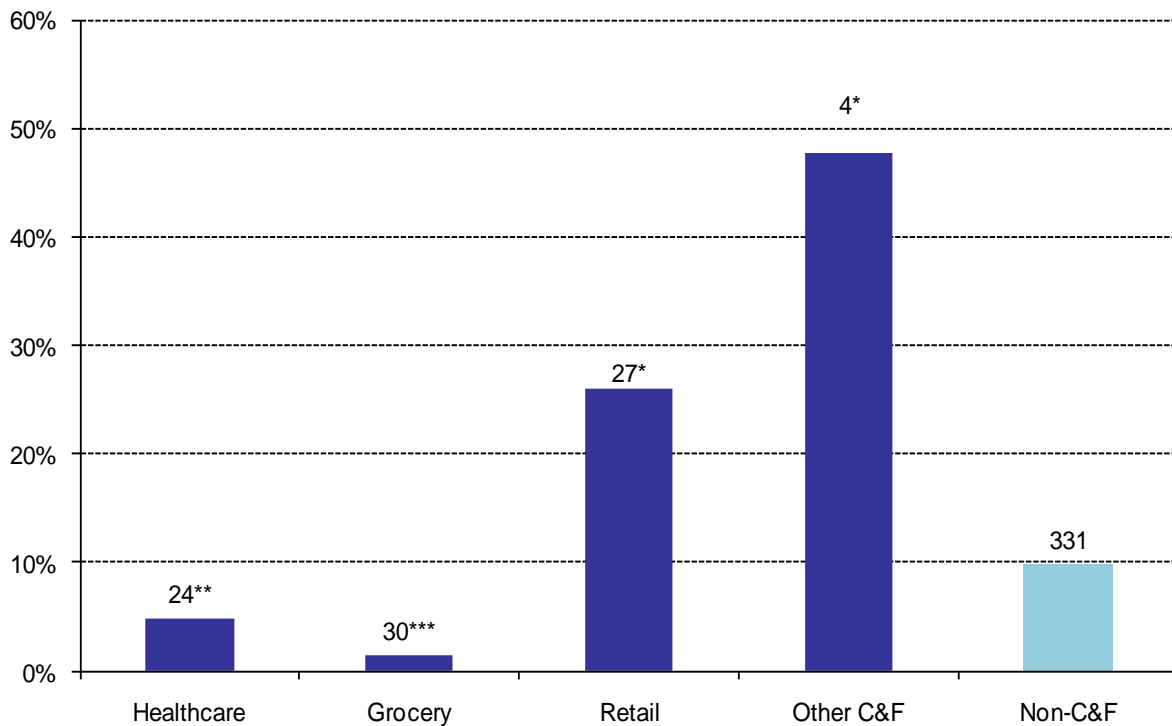
Market Segment	Free Ridership	Comparison with Non-C&F		
		Diff	t-stat	Conf Level
Healthcare	5%	-5%	2.40	98%
Grocery	1%	-8%	5.40	100%
Retail	26%	16%	1.86	94%
Other C&F	48%	38%	1.89	94%
Non-C&F	10%	NA	NA	NA

²² Massachusetts Energy Efficiency Programs in Large Commercial & Industrial Evaluation Contractor. *Project 1B Chain & Franchises Literature Review – FINAL MEMO*. Prepared for the Massachusetts Energy Efficiency Program Administrators. December 7, 2010 Page 5.

²³ Ibid. Page 6.

²⁴ Ibid. Page 5.

**Figure 4-4: NSTAR Free-ridership Results-
2004–2007, C&F vs. Non-C&F by Market Segment**



- * The C&F market segment result and the overall Non-C&F result are statistically different from each other at the 90% level of confidence.
- ** The C & F market segment result and the overall Non-C&F result are statistically different from each other at the 95% level of confidence.
- *** The C&F market segment result and the overall Non-C&F result are statistically different from each other at the 99% level of confidence.

4.5 Customer Decision-Making Questions

The motivations for investigating C&F as a separate market segment include: C&F’s account for a meaningful portion of C&I energy consumption; and the decision-making process for new construction and purchase of energy consuming equipment is different for C&Fs and non-C&Fs. As mentioned above, some program planners think this may lead to higher rates of free-ridership for C&Fs. The 2004, 2005, 2006 and 2007 NSTAR impact evaluation interviews included a series of questions regarding company-wide energy efficiency policies that shed some light on the second motivation. KEMA analyzed these data to further investigate the

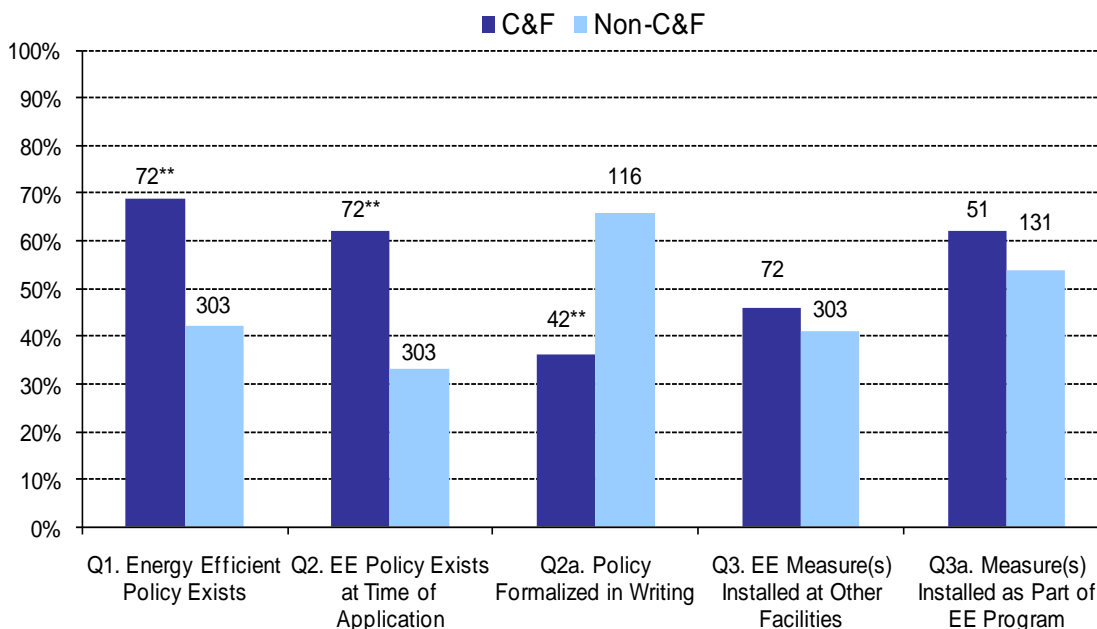
decision-making practices of C&F that may lead to more or less energy efficiency program free-ridership. The series of interview questions includes:

- Q1. Does your company have an Energy Efficiency Policy?
- Q2. Did your company have an Energy Efficiency Policy in place at the time of the application?
 - Q2a. If yes, is this a formal written policy?
- Q3. To the best of your knowledge, is the same energy efficiency [measure] installed at other facilities owned or operated by your company?
 - Q3a. If yes, were the [measures] installed as part of an energy efficiency program?

KEMA analyzed the interview data using appropriate sample weights for the 2004 through 2007 studies. Similar to the previous section the number above each bar represents the sample size for each question and the number of asterisks following the sample size indicates the level of statistical significance for each C&F versus non-C&F comparison.

Figure 4-5 presents the results of the Customer Decision-Making Questions by C&F versus non-C&F. Nearly 70 percent of C&Fs have an Energy Efficiency Policy in place compared to only 42 percent of non-C&Fs. This difference is statistically significant at the 95 percent level of confidence. Furthermore C&Fs were much more likely to have an Energy Efficiency Policy in place at the time of the application (62 percent for C&Fs and 33 percent for non-C&Fs).

Figure 4-5: NSTAR Customer Decision-Making Results- 2004–2007, Questions on Company-Wide Energy Efficiency Policy by C&F vs. Non-C&F



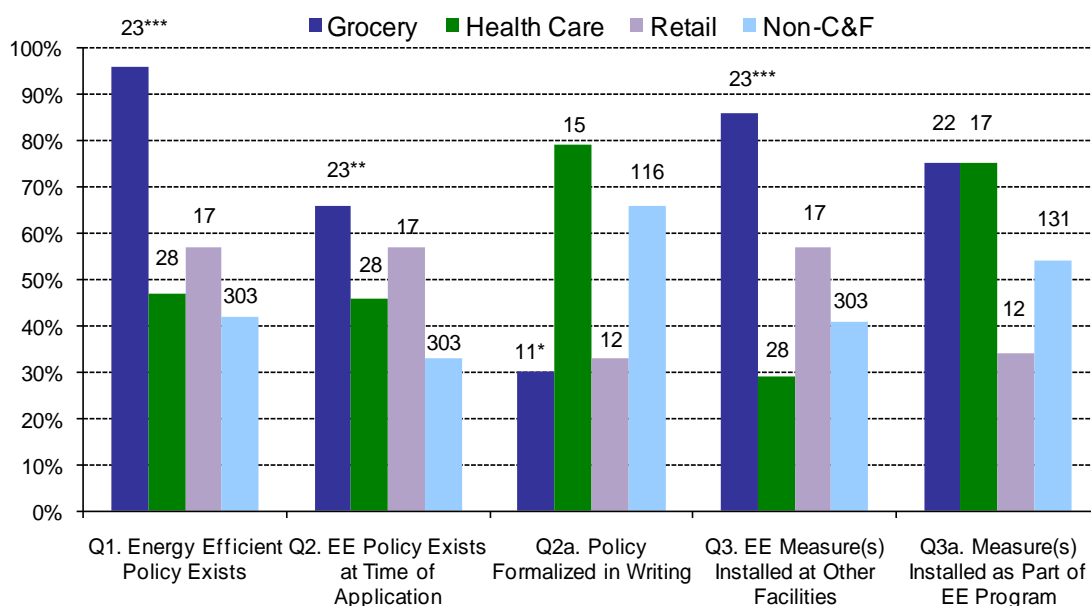
** The C&F and Non-C&F results are statistically different from each other at the 95 percent level of confidence.

It is noteworthy however, that of the customers with an energy efficiency policy at the time of the application, surprisingly few C&Fs indicated that these policies were formalized in writing. Of those customers with a company policy, only 36 percent of C&Fs confirmed this policy was formally written. In contrast, 66 percent of non-C&F customers who had company policies said they were formalized in writing. The vast majority of informal policies were defined by the customer as their effort to reduce energy cost whenever cost effective.

Regardless of the differences in the existence of company-wide policy, or the formality of that policy, a roughly equal percentage of 46 percent of C&F and 41 percent of non-C&F customers indicated that the same energy efficiency measure(s) had been installed at other facilities owned or operated by the same company. Of those that had the measure(s) installed in other locations, a statistically similar percentage of C&Fs (62 percent) and non-C&Fs (54 percent) claimed the installed measure(s) were part of an energy efficiency program.

Next, KEMA took a closer look at the C&F results with a further segmentation by type of C&F. As sample sizes shrink it becomes increasingly difficult to identify difference between groups. However this look does provide interesting information when considered in conjunction with the findings of the Literature Review. Figure 4-6 shows the results of the Customer Decision-Making Questions this time segmented by the type of C&F. The only statistical differences were reported for the grocery segment.

Figure 4-6: NSTAR Customer Decision-Making Results- 2004–2007, Questions on Company-Wide Energy Efficiency Policy by Type of C&F²⁵



- * The C&F market segment result and the overall Non-C&F result are statistically different from each other at the 90 percent level of confidence.
- ** The C& F market segment result and the overall Non-C&F result are statistically different from each other at the 95 percent level of confidence.
- *** The C&F market segment result and the overall Non-C&F result are statistically different from each other at the 99 percent level of confidence.

²⁵ Lodging and Restaurant were not reported in the table due to small sample sizes. There was only two of each type of C&F in the sample.

Analysis of the C&F sample by building segment reveals varying trends for grocery, health care, and retail customers.

- **Grocery** customers appear to be promoting energy efficiency through informal policies while simultaneously taking advantage of energy efficiency programs. A majority of grocery customers (96 percent) reported to have an Energy Efficiency Policy, and 66 percent indicated the policy was in place at the time of the application. Despite the fact that only 30 percent of those policies were formalized in writing, 86 percent of grocery customers installed the same measure(s) at other facilities, 75 percent of which were part of an energy efficiency program.
- **Health care** facilities do not appear to be promoting an energy efficiency policy, nor installing measures at other facilities as frequently as grocery customers or at rates different from non-C&Fs. Roughly half of health care customers had a policy in place at the time of the application, and 79 percent of those with policies were formalized. Of the 29 percent of health care customers with measures installed at other facilities, 75 percent claimed the other locations took advantage of an energy efficiency program.
- **Retail** customer results are statistically similar to the non-C&F results. Roughly half of retail customers (57 percent) had a policy in place at the time of the application, 33 percent of which were formalized. Fifty-seven percent claimed that the same measure(s) were installed at other facilities, but only a third of those customers indicated installation at other locations were part of an energy efficiency program.

In summary, grocery customers appear to have informal policies, readily install energy efficient equipment, and take advantage of energy efficiency programs. Health care customers moderately, but formally establish policies, less frequently install efficient equipment, yet take advantage of efficiency programs when they do. Finally, retail customers moderately and informally identify company policies on efficiency, moderately install efficient equipment, and less frequently take advantage of efficiency programs. Taken individually and with more research, these trends may be more completely defined and understood.

4.6 Conclusions

The results of the re-analysis of NSTAR impact evaluation data report significant differences in the levels of free-ridership between national accounts (i.e. C&F) and non-national accounts. However the relationship is multifaceted and should not be assessed by a simple one-dimensional comparison of C&Fs and non-C&Fs. This conclusion generally supports the recent National Accounts research performed for National Grid that found significant differences in the levels of free-ridership between national accounts (i.e. C&F) and non-national accounts with

variations in the direction of the difference by technology. In that research national accounts tended to have higher free-ridership rates for HVAC equipment but lower free-ridership rates for lighting measures compared to non-national accounts. These differences would be masked in a one-dimensional comparison of C&Fs versus non-C&Fs.

The purpose of this task was to provide an indication of the extent to which C&F customer are associated with higher level of free-ridership than non-C&Fs. KEMA's multi-step analysis provides the following conclusions:

- **C&F market is large enough to merit independent analysis.** Overall C&Fs account for 20 percent of total sampled customers and 19 percent of program tracked kWh savings in the sample. We do not know if the NSTAR sample is representative of all of Massachusetts.
- **Free-ridership levels varied by C&F vs. Non-C&F at disaggregated levels.**
 - **By Program Year:** The aggregated results (2004-2007) did not reveal statistical differences, however:
 - In year 2006, C&F customers had higher free-ridership rates than Non-C&Fs. The 18-percentage point difference, based on a sample including no lighting measures, is nearly significant at the 90 percent level. This result is consistent with the findings of National Grid's 2006 study that found higher free-ridership levels with C&Fs for HVAC measures.
 - In 2004, the C&F free-ridership rate was lower than the Non-C&F group and significant at the 93 percent level of confidence. The 2004 study included lighting and non-lighting measures; therefore it is uncertain if this result is consistent with the National Grid study results.
 - **By C&F Market Segment:** Free-ridership rates for Grocery, Health Care, Retail, and Other C&Fs were significantly different than the Non-C&F segment. However the direction of the differences varied. Grocery and Health Care C&F rates were lower, while Retail and Other C&F rates were higher. Further investigation into the difference across C&Fs could identify and explain the driving forces behind these differences.
- **Free-ridership levels did not vary by measure type.** No statistical differences between C&Fs and non-C&Fs were found for lighting and non-lighting measures. These results are not consistent with those reported in the National Grid studies. KEMA recommends further analysis of the variations in free-ridership levels by technology. However, there are likely additional factors involved that are masked by combining four years of data. While type of measure is likely a factor perhaps free-ridership rates are more closely correlated with the market segment or type of project (new construction vs. retrofit).

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- **C&Fs are more likely to have Energy Efficiency Policies.** Nearly 70 percent of C&Fs had an Energy Efficiency Policy in place and 63 percent had policies in place at the time of the application compared to only 42 and 33 percent for non-C&Fs, respectively. Both results are statistically significant at the 95 percent level of confidence.
 - **C&Fs' Energy Efficiency Policies are more likely to be informal.** Only 36 percent of C&Fs reported having a written policy, compared with 66 percent of non-C&Fs. The difference is significant at the 95 percent level of confidence.
 - **Overall, C&Fs and non-C&Fs are equally likely to install energy efficiency measures at other facilities, and install energy efficient measures as part of an energy efficiency program.**
 - **Existence and implementation of Energy Efficiency Policies vary by type of C&F.**
 - Grocery C&Fs tended to: have central decision-making with an informal (not in writing) Energy Efficiency Policy, similar energy efficient measures installed at other facilities, and installed measures as part of an energy efficiency program. However grocery C&Fs also reported low free-ridership rates (5 percent).
 - Half of health care C&Fs had an Energy Efficiency Policy, and the majority (80 percent) that did tend to be formalized in writing. Only one-quarter installed similar energy efficient measures at other facilities, but about three-quarters of those installed as part of an energy efficiency program. Yet health care also reported low free-ridership rates (1 percent).
 - Retail C&Fs decision-making question results did not differ from the non-C&Fs. More than half of retail C&Fs reported the installation of similar energy efficient measures at other facilities, and the lowest percentage point result (34 percent) for installation through an energy efficiency program. Retail C&Fs also reported the highest free-ridership levels at 26 percent compared with grocery and health care.

5. Customer Quantitative Profile

5.1 Introduction

This section presents a detailed characterization of the chains and franchises (C&F) market in Massachusetts. This characterization provides estimates of the size and composition of the C&F market.

We present the quantitative profile of the C&F sector in the following sections:

- **Summary of Findings** – Provides an overview of the key findings from this analysis.
- **Overview of Approach** – Summary of the data sources and approaches used to identify and characterize the population of C&F's in Massachusetts.
- **Characterization of C&F Population (D&B Data)** – Presents a detailed analysis of the population of firms in the Massachusetts C&F sector.
- **Characterization of C&F Construction Projects (Dodge Data)** – Provides analysis of the new construction activity in the C&F sector over the past five years.
- **Conclusions** – Presents conclusions based on findings from this study.

5.2 Summary of Findings

The findings presented in this section describe the population of C&F firms in Massachusetts and new construction projects completed for C&F firms separately. Summaries of each are presented below.

5.2.1 Population of Massachusetts C&F Firms

- KEMA identified 4,739 C&F locations in Massachusetts:
 - 2,526 were designated as branches; and

- 2,213 were single (non-branch) locations²⁶.
- Chain and franchise locations were highly concentrated in the retail trade industry, which accounts for 73 percent of all C&F locations. Within retail trade:
 - 34 percent of locations were eating and drinking establishments;
 - 25 percent were food stores; and
 - 20 percent were automotive related.
- Nearly two-thirds of all C&F locations have 5 to 20 employees and 24 percent had 21 to 50 employees.
- The ownership structure of firms in the C&F sector varied considerably.
 - 75 percent of the 4,739 firms are owned by the franchisee and 25 percent are owned by a larger corporate entity.
 - Of the franchisee owned locations, 38 percent were designated a branch locations, and 62 percent were single (independent) sites. The transportation and public utilities sector maintained the highest concentration of corporate owned locations, at 30 percent of the industry's C&F firms.
- The largest C&F in MA in terms of number of establishments are Dunkin Donuts, CVS, McDonalds, Subway, Papa Gino's, and Friendly's, all with more than 100 locations in the state²⁷.

5.2.2 C&F Construction – Past Five Years

- 2,129 new construction projects performed over the past five years for C&F firms.
 - 75 percent were completed for stores and restaurants,

²⁶ A single non-branch C&F location is a site that operates under a brand name, purchased by the franchisee from the corporation. However they maintain considerable autonomy.

²⁷ The determination of chains and franchises is further explained on pages 5 through 7 in the discussion of the data sources

- 12 percent for offices and banks, and
- 13 percent for all other industries combined.
- Over 65 percent of those construction projects were alterations, renovations and interior completions, while 33 percent were classified as new development. We classified the remaining 2 percent of projects as “other construction.”
- Stores and restaurants accounted for 69 percent of the C&F construction’s total square footage, but only 53 percent of the value of projects completed. Meanwhile, projects performed for hotels and motels were just 3 percent of all projects, but 12 percent of square footage, and 24 percent of the total value of C&F construction projects. Office and bank buildings reported the second largest number of projects, 257, but only 5 percent of the total value and 3 percent of the square footage of C&F construction. Hospital and other health treatment segment accounted for 11 percent of the square footage of C&F construction and 13 percent of the total value of this construction.
- Trends in C&F over the past five years were reflective of the economic conditions, but the corresponding decline after the 2007 downturn was seen most prominently in the retail sector. Construction in hospitals and other health treatment facilities began to increase in 2010.

5.3 Overview of Approach

A more complete understanding of the size and composition of the C&F market in Massachusetts is an important step to assessing the approaches necessary to work with these customers and achieve greater potential energy savings in this sector. The evaluation team was not aware of any single source of information or data that characterizes the C&F market in Massachusetts in its entirety. Furthermore, we understood that C&F status was not currently tracked in the electric and gas PA’s customer information systems (CIS).

The usefulness of the Customer Quantitative Profile and the ability of the evaluation team to achieve the two aforementioned objectives within the limits of the budget were highly dependent on the quality and applicability of the data sources. Following the investigation of potential sources of information the evaluation team selected the two most comprehensive data sources identified, which we used to develop population estimates and characterize the population of chains and franchises.

5.3.1 Data Sources

As presented in the January 27, 2011 memo²⁸, KEMA identified two sources for developing the quantitative profile: Dun and Bradstreet's Franchise File and the Dodge Players' database. Each of these sources is discussed in detail below.

5.3.1.1 Dun and Bradstreet's (D&B) Database

Dun and Bradstreet's franchise file (D&B) was the most comprehensive data source available for identifying C&F's in Massachusetts. The database consisted of a listing of all Massachusetts based firms that D&B had identified as a franchise. The database contained company and site specific information such as number of employees, revenue, and various fields identifying the ownership structure under which each location operates. KEMA used the D&B data to define and characterize the population of C&F.

The D&B database provided detailed firm-o-graphic data on 5,001 sites in Massachusetts that were self-reported as a franchise. Although the D&B is the most comprehensive source of C&F's available, there are limitations to the data. Despite D&B's use of the name "franchise file," the file was not limited to franchises, but also contained information from chains in the Massachusetts. However, KEMA determined that several known national and local large and small chains were not listed in the file. Communication with D&B indicated that the absence of a universally recognized definition of a chain obscures D&B's ability to isolate all chains in the D&B universe of firms. While a thorough analysis of the entire D&B universe for Massachusetts²⁹ was likely to enable the study team to identify additional chains, this task utilized the franchise file as the most cost-effective means of identifying the population of C&F's in Massachusetts. Therefore, as a caveat to the foregoing analysis we recognize that the population of C&F's presented provides a conservative estimate of the total size of this sector.

The study team will also use the D&B data to extract a sample of firms to be used for conducting interviews with chain and franchise owners as discussed in objective two of the

²⁸ Massachusetts Large Commercial and Industrial Evaluation Contractor (LCIEC). *Investigation of Project 1B Chain and Franchise Customer Quantitative Profile Data Sources*. Prepared for the Massachusetts Energy Efficiency Program Administrators. January 27, 2011.

²⁹ D&B's universe of Massachusetts companies with five or more employees can be obtained for \$35,000.

customer quantitative profile. The sampling plan, to be presented in a subsequent section, will use strata identified in the detailed description of the C&F population below.

5.3.1.2 Dodge Players' Database

In this section we review the Dodge Players' Database (Dodge data) and how it was used to characterize recent (previous five years) construction activity in the C&F sector.

The Dodge database contains retrospective information on commercial and industrial new construction projects or alterations that, according to Dodge, were started as of the date of Q3-2010. As discussed in the Final Work Plan for Project 1A³⁰, Dodge attempts to compile data that identifies project owners and other principals, the primary use of the new space, the building size, and the estimated project costs. To obtain this data, field reporters employed by McGraw Hill regularly visited construction permitting offices to identify new building projects and made further contact with project managers, in an effort to gain information on the construction project and the businesses involved with the project. The database contains information pertaining to all identified new construction and remodeling projects for non-residential firms in Massachusetts between 1996 and the third quarter of 2010.³¹

KEMA used the project specific data provided by the Dodge data to complement the population information provided by D&B, but the two data sources could not be combined because there were no discernable fields upon which to link the data. Whereas the D&B data were used to define the population of C&F's in Massachusetts, we used the Dodge data to characterize the new construction projects performed by the subset of the C&F population contained in the database.

In order to analyze construction projects of C&F locations, KEMA isolated those projects undertaken by C&F firms from non-C&F firms. This was a three step process:

³⁰ Massachusetts Large Commercial & Industrial Evaluation Contractor (LCIEC). *Final Work Plan Project 1A New Construction Market Characterization*. Prepared for the Massachusetts Energy Efficiency Program Administrators. August 6, 2010.

³¹ The Dodge data contains data concerning new construction projects that occurred over the past 14 years. However, in order to restrict the analysis to "recent construction," we limited our analysis to the past five years of data only.

- First, we limited our analysis the previous five years (Q4-2005 through Q3-2010) to focus on recent construction in the C&F market.
- Second, we selected the market segments, pre-defined by Dodge, that were likely to contain C&F firms.
- Third, we manually reviewed the player names (i.e. customer names) to select only C&F projects in the market segments identified in Step 2.

The second and third steps are discussed in more detail below.

KEMA reviewed all projects associated with market segments presented in the January 21 Project 1A memo titled, *Customer Quantitative Profile – Initial Analysis of Dodge Players Database and PA Aggregate Program Records*.³² KEMA determined that C&F's were found in the following five market segments as defined by Dodge:

1. Amusement and social recreation;
2. Hospitals and other health;
3. Hotels and motels;
4. Offices and banks; and
5. Stores and restaurants.

We found 5,326 records pertaining to individual projects constructed in these five market segments over the past five years. For each project record, the database provided a project description and also identified one or more "Players," organizations associated with the project. Players are classified as one the following of six player types:

1. Architect (not Landscape);
2. Electrical Engineer;
3. Engineer (no specialty);
4. General Contractor;
5. Mechanical Engineer; and

³² MA LCIEC Evaluation Team. Project 1A. *Customer Quantitative Profile – Initial Analysis of Dodge Players Database and PA Aggregate Program Records* January 21, 2011.

6. Owner.

Next, KEMA selected C&F projects based on the player name and project description. We first attempted to identify individual projects associated with C&F's by first restricting the player type to "Owners" and visually scanning the player name. However, visually inspecting the player names revealed that many of the players that were classified as owners were actually construction firms and realty companies. The name of the building's residents was often only found in the project name. Therefore, we then visually inspected both the player name and project descriptions associated with each record to identify projects that corresponded to C&F firms. By employing the following criteria to this visual inspection, we identified 2,129 unique construction projects associated with C&F companies:

1. Multiple locations operating under the same name and be managed by a central body (corp. or franchise owner).
2. Provides customer oriented, walk-in type service.

5.4 Characterization of C&F Population (D&B Data)

In this section we provide a description of the population of the C&F sector in Massachusetts based on data provided by the D&B database. The section is organized as follows:

- **Overview of the C&F population** – Presents the total number of C&F locations in Massachusetts.
- **Industry segmentation** – Analyzes the distribution of C&F firms and employment by industry.
- **Ownership structure** – Examines the differing relationship between individual C&F locations and their parent companies.
- **Key players** – Identifies C&F companies with a large number of locations in Massachusetts.

5.4.1 Overview of the C&F Population

The D&B database contains a total of 4,739 physical locations for C&F companies in Massachusetts.³³ Each record in the database contains information pertaining to characteristics of the location including number of employees, revenue, address, industry, and type of location (status). The type of location depicts the manner in which that specific site relates to the parent or headquarters of the company. Table 5-1 shows that the 4,739 locations in the D&B data were divided roughly equally among branches and single sites.³⁴

**Table 5-1: Massachusetts C&F Locations-
by Type of Site³⁵**

Status	Number of Locations
Branch	2,526
Single Site	2,213
Total	4,739

5.4.2 Industry Segmentation

We used the SIC code designation of each location provided by the D&B database to segment C&F firms into industries. Using the two-digit SIC code, we grouped the 4,739 C&F locations into the seven major market segments seen in Table 5-2. In Figure 5-1 we present the distribution of the 4,739 C&F locations by market segment. The diagram demonstrates that the overwhelming majority of C&F locations, 73 percent, were in retail trade. The next largest market sector was services with 19 percent of all C&F locations. This was followed by the Finance, Insurance and Real Estate sector, which has many relatively small offices that operate under corporate brands.

³³ We refer to the individual records in the D&B dataset as locations because they provide data on a separate physical location of a firm.

³⁴ An additional 262 locations, designated as headquarters, were also in the file, but upon review of these records, we concluded data provided by these records was inconsistent with the branches and single sites as they frequently reported employment and revenue for multiple locations. Consequently these records were removed from the analysis.

³⁵ Dun & Bradstreet Massachusetts Franchise File. January 2011.

**Table 5-2: Industry Sector Definitions-
by SIC Code**

SIC code description	Primary SIC code	C&F Locations
Construction	15-17	14
Manufacturing	20-39	54
Transportation and Public Utilities	40-49	44
Wholesale Trade	50-51	28
Retail Trade	52-59	3,471
Finance, Insurance, and Real Estate	60-67	250
Services	70-89	878
Total		4,739

**Figure 5-1: Percent of Massachusetts C&F Locations-
by Market Segment**

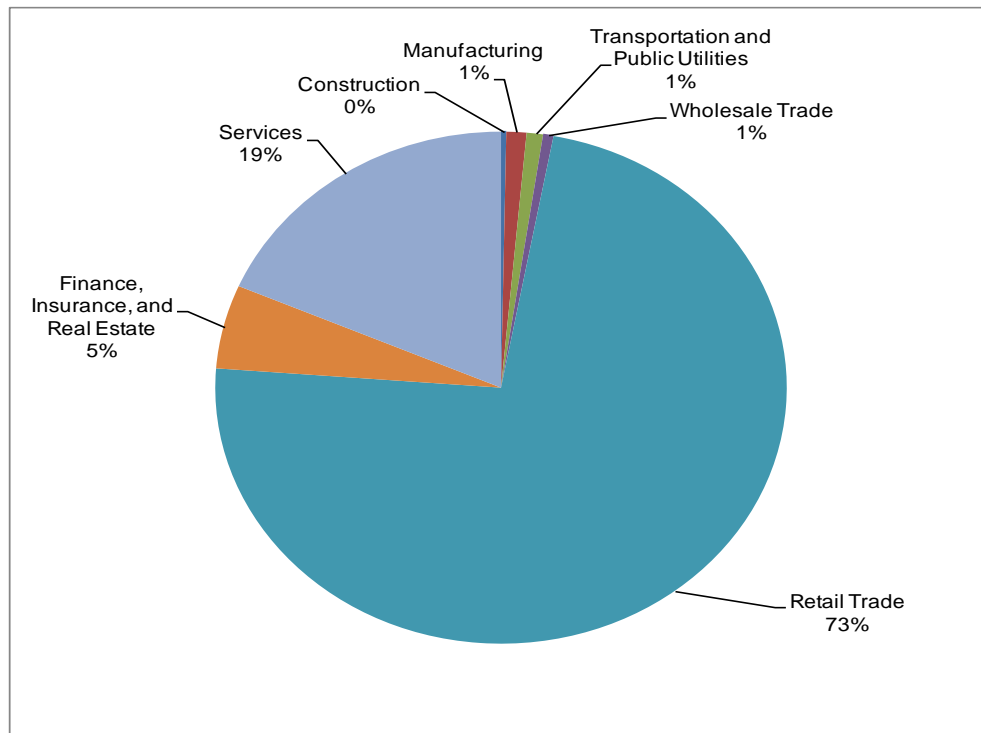
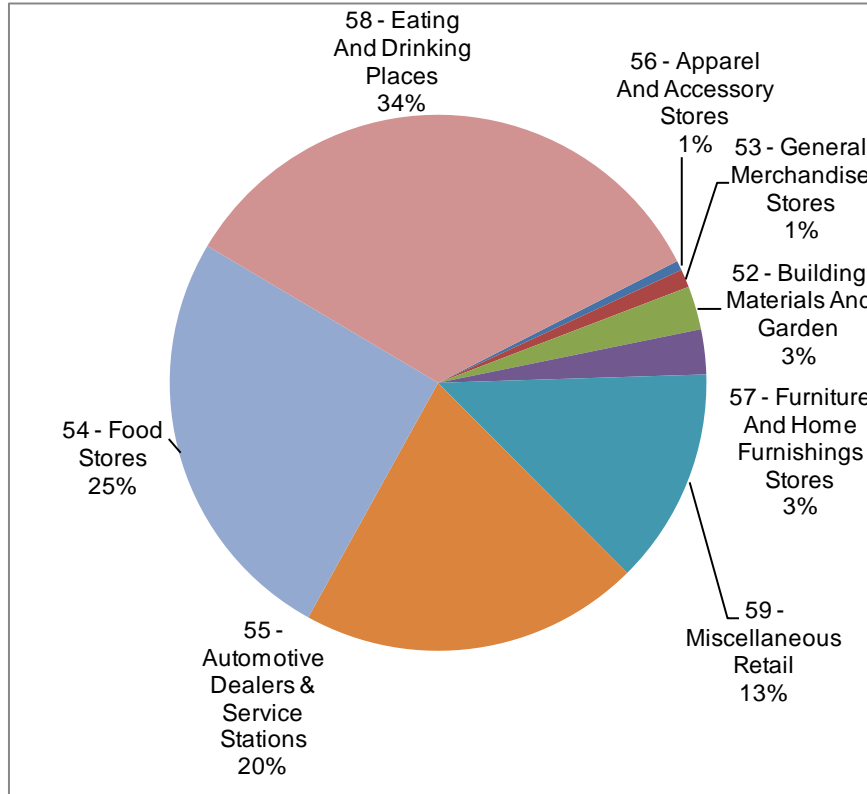


Figure 5-2 presents a further breakout of the 73 percent of firms in the retail sector in order to demonstrate the wide variety of sub-industries. The diagram shows that eating and drinking establishments make up over one-third of establishments in the retail sector, (or 34 percent of

all C&F locations). This is an important finding because establishments such as McDonalds, Dunkin Donuts, Taco Bell, and Friendly's are often located in sites that are structurally and aesthetically similar and therefore follow similar construction practices. While the franchisee or local manager may maintain some operational autonomy, these businesses may be required to follow corporate policy regarding building construction and maintenance practices and may be constrained to using certain suppliers, designers, and construction firms. However, understanding the degree to which central authority extends to energy consumption from refrigeration, HVAC requires additional primary research beyond the scope of this task.

The second largest group of retail C&F locations was food stores, which accounted for over a quarter of all retail C&F locations. These facilities were typically large warehouse type buildings with minimal internal framing or design. Facilities that fell into this category, such as grocery stores, were typically large consumers of electricity used to operate lighting and temperature controlled storage for food products and to maintain comfortable ambient temperatures.

**Figure 5-2: Percent of Massachusetts Retail C&F Locations-
by Industry**



In Table 5-3 we present the number of locations by market sector and employee size. Since the D&B data does not contain information on energy use, employees per site is used as a proxy. This data suggests that on average, chains and franchises in Massachusetts had a relatively small number of employees at each site, regardless of their type of business. Overall, 3,079 sites (65 percent) had only 5-20 employees. The table also shows that the second smallest size category, 21 – 50 employees accounted for 1,154 locations (24 percent) of C&F locations. Over 80 percent of firms in this size category were from the retail sector.

**Table 5-3: Massachusetts C&F Locations-
by Industry Sector and Employee Size**

Market Segment	Number of Employees									
	5-20		21-50		51-100		101-500		500+	
	Locations	Percent	Locations	Percent	Locations	Percent	Locations	Percent	Locations	Percent
Construction	13	0.4%	-	0%	1	0.3%	0	0%	-	0%
Manufacturing	44	1.4%	4	0.3%	4	1.3%	2	1.0%	-	0%
Transportation and Public Utilities	30	1.0%	8	0.7%	3	1.0%	3	1.5%	-	0%
Wholesale Trade	25	0.8%	1	0.1%	2	0.7%	.	.	-	0%
Retail Trade	2,151	69.9%	931	80.7%	232	75.6%	157	79.3%	-	0%
Finance, Insurance, and Real Estate	176	5.7%	62	5.4%	10	3.3%	2	1.0%	-	0%
Services	640	20.8%	148	12.8%	55	17.9%	34	17.2%	1	100.0%
All	3,079	100.0%	1,154	100.0%	307	100.0%	198	100.0%	1	100.0%

5.4.3 Ownership Structure

Ownership structure is one of the most critical pieces of information needed for understanding potential differences in the C&F sector concerning the corporate policies impacting individual locations. The D&B database provided two important elements for defining ownership structure:

1. The headquarters of each location; and
2. The relationship of each location to that headquarters and the overall company.

Each of these was discussed in detail below.

5.4.3.1 Identifying the Headquarters of Each Location

The D&B data provided information that allowed us to identify the headquarters of each location in the database. The D&B database identified the following information that we used to determine the headquarters of each C&F location:

- Headquarters (HQDUNS) – The DUNS number of the company headquarter location. D&B defines the headquarter location as the central location for all branches and sites of a company from which business operations were performed. The headquarters was part of the same company as the separate locations, rather than another corporate entity or holding company.

-
- Parent (PARENTDUNS) – This is the DUNS number associated with a separate company that directly owns the company identified by the record.
 - Ultimate parent (ULTIMATEDUNS) – This was a separate company that was the highest level of corporate ownership of a company. For example, the ultimate parent could be a holding company that owns many companies in various industries.

KEMA used this information to identify the headquarters of each location. The specific rules we employed to determine the headquarters of each location are as follows:

- If the location had an identified headquarters (HQDUNS), the headquarters was set to HQDUNS. The HQDUNS took priority because it represents a central headquarters within the same company;
- If the HQDUNS field was left blank and the location had an associated parent, (PARENTDUNS), the headquarters was set to PARENTDUNS. The parent took priority over the ultimate parent because the parent will not be associated with a holding company, while the ultimate parent often is a holding company or some other large multinational corporation.
- If both HQDUNS and PARENTDUNS were missing, the headquarters was set to ULTIMATEDUNS. The ultimate parent was a separate firm that can often be a holding company and least likely to be directly related to the business performed at the location.
- After assigning headquarters to each location, we determined that a substantial number of locations did not have a headquarters. Further, we found that nearly all of these records had a location type that suggested they were a single site. These sites were assumed to belong to an autonomous franchise structure in which the local owner has purchased the rights to the brand name, but their contractual obligations are not the same as that of locations that roll up to a headquarters or parent. We assigned the site level DUNS number to the headquarters in these cases; that is, these sites were classified as single site locations. In the Key Players section we further analyzed these records by company name to identify the corporate entity to which they belong. Additional primary research beyond the budget and scope of this task is required to determine the nature of the ownership structure of these firms.

Once we identified the headquarters of each location, we were able to roll up the number of locations under each headquarter location and calculate the average employment and revenue

for those headquarters. In Table 5-4 we identify the number of headquarters associated with locations in each industry, and also reported the average number of employees, and average revenue.³⁶ For the Construction, Manufacturing, Transportation, and Wholesale segments, we found that the number of sites was close or equal to the number of identified headquarters. Retail trade has the largest number of C&F locations, headquarters, and average revenue per site. The transportation and public utilities sector has the second largest revenue per site and the most employees per site, but the third smallest number of sites across all sectors.

**Table 5-4: Massachusetts C&F Location and Headquarter Detail-
by Industry**

Market Segment	Number of locations	Number of Headquarters ¹	Average employment ²	Average annual revenue
Construction	14	14	14	\$1,300,000
Manufacturing	54	51	22	\$1,130,000
Transportation and Public Utilities	44	35	30	\$2,100,000
Wholesale Trade	28	21	17	\$1,840,000
Retail Trade	3,471	1,675	28	\$3,340,000
Finance, Insurance, and Real Estate	250	222	21	\$1,050,000
Services	878	633	26	\$1,040,000
All	4,739	2,651	27	\$2,740,000

1. The number of headquarters provides a count of unique headquarters associated with the individual locations.

2. Average number of employees and revenue at location level

5.4.3.2 Ownership Type

The type of ownership of locations provides insight into the level of autonomy amongst Massachusetts’ chains and franchises, and thus the businesses’ potential ability to make decisions about their building and energy using equipment. For each record in the database, D&B identifies whether the location is owned by the franchisee or the corporation. A franchisee owned site is one in which the local entrepreneur (the franchisee) owned and operated one or more locations of the franchised business. The franchisee purchases the brand and some set of resources from the corporate owner, but operates an “independent” business.

Communication with D&B indicated that the extent of their independence was determined by the

³⁶ Throughout the profile, SIC code, employment, revenue, and revenue are provided at the site level because headquarter level information is not reported consistently in the D&B data.

franchise contract, which can vary. A corporate owned location was one in which the local management did not own the location(s) as an independent business. The location was instead owned by the corporate entity. Under a single corporate entity, there could be both corporate owned and franchisee owned locations.

KEMA assumes that company owned sites faced some degree of obligation to a central managing company that controls certain aspects of their operations. Conversely, franchisee owned locations were likely to face somewhat less restrictive obligations to a central company, as the franchisee had essentially purchased some set of rights from the corporate entity.

In Table 5-5 we present the number of locations, average number of employees, and average revenue according to their ownership type: franchisee or corporate. The data suggested that, while there was not much of a difference in the relative size (as determined by average employment and annual revenue) of firms with corporate or franchisee ownership, franchisee ownership was a far more common relationship between the franchisee and corporate entity. The data demonstrates the need for greater understanding of the influence over construction and maintenance practices exerted by the corporate entity under each ownership type. Due to the large number of firms that fall under each ownership type, it is important for future program design to determine the impact that those contractual relationships have on the governance of facility construction and maintenance policies. Because the relationship between the headquarters and locations can vary within each ownership type, it is also important to define how the influence of centralized construction and maintenance policies varies within each ownership type.

**Table 5-5: Distribution of Locations-
by Type of Owner**

Ownership	Number of locations	Average employment	Average annual revenue
Franchisee	3,542	28	\$2,520,000
Corporate	1,197	25	\$2,600,000

Combining information on type of ownership with the industry sector and type of location provides a powerful view of the ownership structure of C&F firms. This information is presented in Table 5-6. The vast majority of corporate owned locations are designated as branches. The table also shows that 71 percent of locations in the services sector are owned by the franchisee, while 29 percent are owned by the corporation. Over 88 percent of those in the financial sector are also owned by the franchisee. Further, 86 percent of franchisee owned financial services

firms are independent sites with no headquarters. These are likely to be firms such as real estate and insurance brokers, or financial advisors who operate independently under the name of a major corporation whose products they sell.

**Table 5-6: Distribution of Locations -
by Type of Owner and Market Segment**

Market Segment	Corporate Owned Locations				Franchisee Owned Locations				Industry Total
	Branch Location		Single Site		Branch Location		Single Site		
	Frequency	Percent of Industry ¹	Frequency	Percent of Industry	Frequency	Percent of Industry	Frequency	Percent of Industry	
Construction	0	0.0%	0	0.0%	0	0.0%	14	100.0%	14
Manufacturing	5	9.3%	0	0.0%	2	3.7%	47	87.0%	54
Transportation and Public Utilities	13	29.5%	0	0.0%	6	13.6%	25	56.8%	44
Wholesale Trade	8	28.6%	0	0.0%	7	25.0%	13	46.4%	28
Retail Trade	887	25.6%	1	0.0%	1,179	34.0%	1,404	40.4%	3,471
Finance, Insurance, and Real Estate	28	11.2%	2	0.8%	30	12.0%	190	76.0%	250
Services	250	28.5%	3	0.3%	111	12.6%	514	58.5%	878
Location Type Total	1,191		6		1,335		2,207		4,739

1. Equals the number in industry and location type divided by the industry total

While the majority of locations in the retail sector are franchisee owned (74 percent), those roughly 3,500 locations are split fairly evenly among branch locations and single sites. D&B reported six locations were corporate owned single site locations. We assume that D&B misclassified those 6 sites, which included Fuddruckers, MaidPro, Metlife, Coldwell Banker, and two locations of the Westin Hotel.

In Table 5-7 we show the number of C&F locations with headquarters in Massachusetts and outside of Massachusetts. Over 95 percent of headquarters for franchisee owned locations are located within the state. As we would expect, nearly all of the franchise owned single sites have headquarters within the state. However, 62 percent of franchise owned branch headquarters are not located in the Massachusetts. Only 18 percent of headquarters for corporate owned facilities are located within the state.

**Table 5-7: C&F Activity-
by Ownership and Type of Site and Location of Headquarters**

	Establishments Owned by Company				Establishments Owned by Franchisee			
	Headquarter in MA		Headquarter not in MA		Headquarter in MA		Headquarter not in MA	
	Branch	Single Site	Branch	Single Site	Branch	Single Site	Branch	Single Site
Locations	272	1	919	5	758	2,191	577	16
Headquarters	27	1	128	4	184	2,188	112	7
Employees	5,550	21	23,458	755	34,122	44,913	19,586	494

5.4.4 Key Market Players

KEMA used the D&B data to identify key players in the C&F sector. Key players were defined as companies with 20 or more locations under a single company name. Unlike the analysis of company headquarters discussed above, we identified key players using the business name (i.e. the name associated with each record). Reviewing business names manually allowed us to combine records for the same company but with slight variations due to misspelling, different store names, or store number.

In Table 5-8 we present companies identified with 20 or more branch or single site locations.³⁷ Dunkin' Donuts was the overwhelming leader on the key players list with 440 locations. The 440 locations had an average of 14 employees per location. CVS and McDonalds were ranked second and third on the key players list with 193 and 145 locations, respectively. CVS averaged 19 employees per location, while McDonalds was much higher at 42, possibly part time workers. Three supermarkets, Stop & Shop (76 locations), Shaw's (65 locations), and Big Y (21 locations) had the highest average employment with 146, 114, and 156 employees per location, respectively.

³⁷ After reviewing the key players list, it was apparent that some large chain stores are not included in the D&B file. These include big box stores such as Walmart, Target, and Home Depot.

Table 5-8: Key Chains and Franchise Players

Revised Business Name	Number of Locations	Average Employees	Rank of employees per site
Dunkin Donuts	440	14	28
CVS	193	19	18
McDonalds	145	42	8
Subway	121	9	44
Papa Ginos	108	23	16
Friendlys	103	36	9
Rite Aid	99	18	20
Exxon Mobil Corporation	98	9	43
Burger King	97	34	10
Century 21	90	18	19
D Angelos Sandwich Shop	85	15	26
7-Eleven	82	8	46
Stop & Shop	76	146	2
Radioshack	69	6	49
Wendys	68	31	11
Shaws Supermarkets Inc	65	114	3
Autozone	59	12	31
Remax	50	18	21
Dominos Pizza	47	17	23
Sunoco	45	8	47
Blockbuster	44	11	36
Shell	42	10	41
KFC	41	20	17
True Value	39	18	22
Supercuts	37	12	32
Coldwell Banker	36	27	13
Jiffy Lube	33	11	34
H & R Block	31	11	37
Au Bon Pain	29	24	15
Firestone	29	12	33
White Hen Pantry	28	13	30
Holiday Inn	27	71	5
Hallmark	26	10	39
Best Western	25	54	7
Exxon Mobil Coporation	25	15	25
Ace Hardware	24	15	27
Midas Muffler	24	9	45
Boston Market	23	17	24
Citgo	22	11	38
GNC	22	6	50
SERVPRO	22	13	29
Taco Bell	22	25	14
Advance Auto Parts	21	11	35
Big Y	21	156	1
Leader Drug Store	21	10	40
Marriott	21	81	4
NAPA Auto Parts	21	9	42
Panera Bread	21	27	12
Applebees	20	61	6
Curves	20	6	51
U-Haul	20	8	48

5.5 Characterization of C&F Construction Projects (Dodge Data)

In this section we present a summary of the previous five years of construction projects completed for chains and franchises in Massachusetts based on the Dodge Players database (Dodge data). The Dodge data provided information regarding the frequency, location, and magnitude of construction projects undertaken by firms. The database represented the magnitude of construction projects in terms of both square footage and project value (dollars spent). Our analysis of the Dodge data provided the following details of new construction projects undertaken by C&F firms in Massachusetts over the past five years:

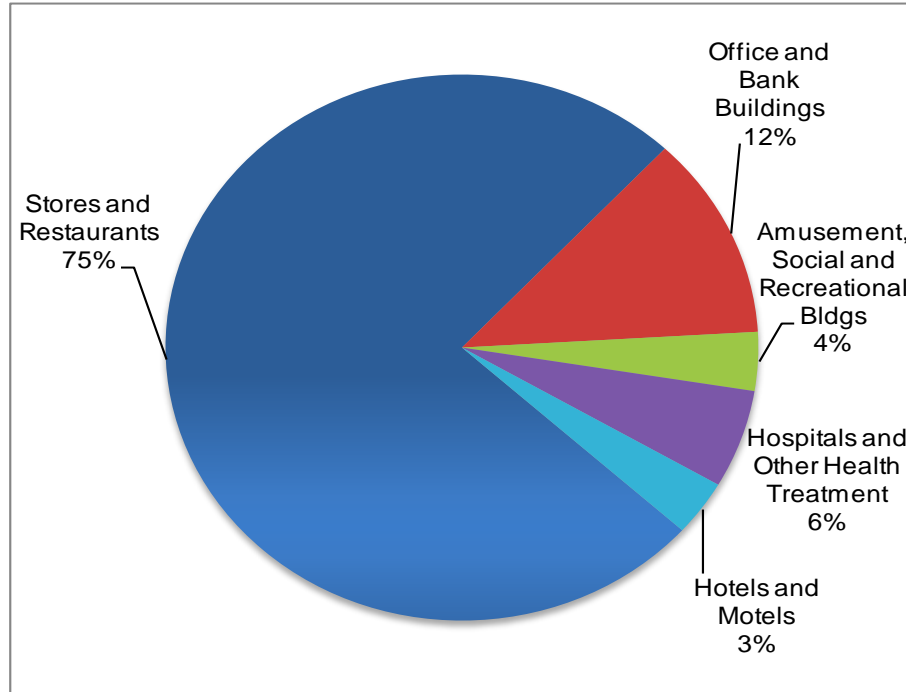
- Projects by market segment and type of project;
- Project by square footage and project value;
- Trends in C&F construction;
- Projects by county; and
- Projects by PA service territory.

5.5.1 Projects by Market Segment and Type of Project

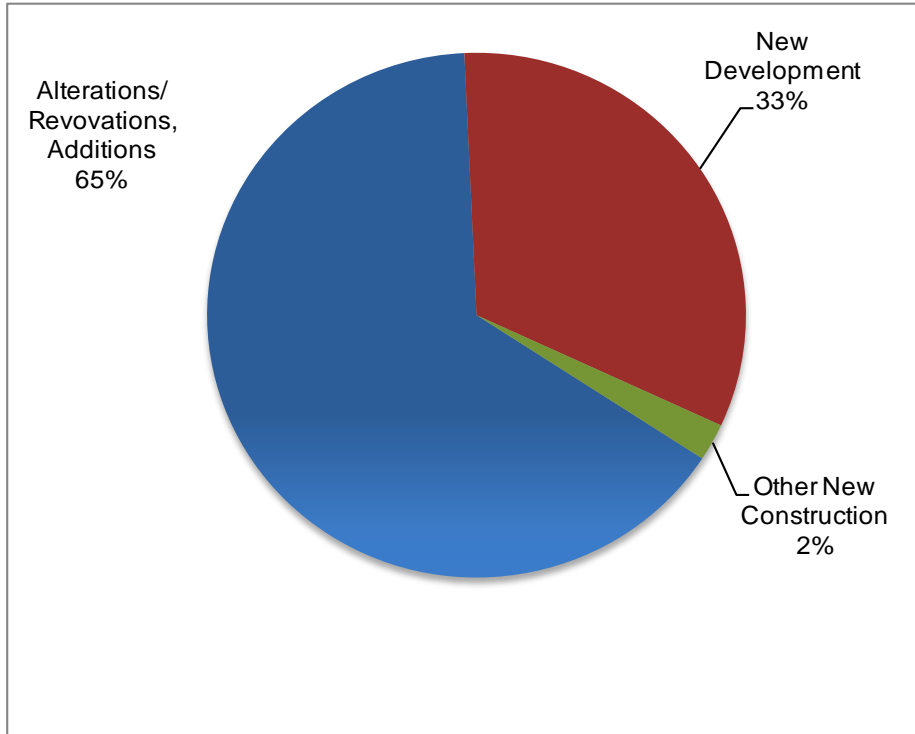
Figure 5-3 shows the distribution of C&F new construction projects by market segment. The figure shows that the majority of C&F construction projects were undertaken by firms classified as stores and restaurants. This finding is consistent with the data presented in the preceding section, which showed that 73 percent of C&F firms were located in the retail trade sector.

In Figure 5-4 we show the magnitude of new construction by the type of project. New construction classified as “Alterations, renovations, and interior completions” constitutes over 65 percent of all C&F new construction projects. New development (i.e. new buildings) makes up 33 percent of new construction in Massachusetts. We classified the remaining 2 percent as other new construction.

**Figure 5-3: Massachusetts C&F Construction Projects-
by Market Segment**



**Figure 5-4: Massachusetts C&F Construction Projects-
by Type of Project Type**



5.5.2 Projects by Square Footage and Project Value

Information in the Dodge data allowed us to determine the magnitude of construction projects in each C&F market segment. KEMA identified the number and value of projects as indicators of the overall magnitude of construction in each market segment. While we also analyzed the reported square footage of projects, it should be noted that this field was often missing in the database, so average square footage was calculated from non-missing values only. In Table 5-9 we provided a summary of C&F construction by market segment.

The table shows that while stores and restaurants account for 75 percent of the number of C&F construction projects and 67 percent of their square footage, they only account for 54 percent of the total value of work done. In contrast, Hotels and Motels account for only 3 percent of projects, but 24 percent of the total value of project. Office and bank buildings reported the second largest number of projects, 257, but only 5 percent of the total value and square footage of C&F construction.

**Table 5-9: C&F Construction Projects-
by Market Segment**

Market Segment	Number of Projects	Percent of Projects	Total Square Feet (1,000 sq ft)	Percent of Square Feet	Total value (\$thousands)	Percent of Value
Amusement, Social and Recreational Bldgs	74	3.5%	1,290	3.6%	189,210	4.2%
Hospitals and Other Health Treatment	124	5.8%	3,961	11.1%	600,878	13.3%
Hotels and Motels	70	3.3%	4,933	13.8%	1,083,891	24.1%
Office and Bank Buildings	257	12.1%	1,631	4.6%	219,391	4.9%
Stores and Restaurants	1,604	75.3%	23,856	66.9%	2,411,624	53.5%
Total	2,129	100.0%	35,671	100.0%	4,504,994	100.0%

In Table 5-10 we separated the number, square footage, and value of C&F construction into new development and all other construction. The data suggests that the largest new construction projects, both in terms of area and value were being built for hotel and motel chains C&F firms. Amusement, social, and recreational renovations had the largest average area, but again, hotels and motels spent the most on their alteration and addition projects. The table also shows that the hospital and other health treatment segment had an average new development value of roughly \$20 million.

**Table 5-10: C&F Construction Projects-
by Market Segment and Type of Construction***

Market Segment	New			Alteration or Addition		
	Number of Projects	Average Area (1,000 sq ft)	Average Project Value (\$thousands)	Number of Projects	Average Area (1,000 sq ft)	Average Project Value (\$thousands)
Amusement, Social and Recreational Bldgs	18	42	4,591	56	9	1,903
Hospitals and Other Health Treatment	21	126	19,662	100	13	1,875
Hotels and Motels	24	140	36,154	45	35	4,801
Office and Bank Buildings	99	8	1,125	154	5	697
Stores and Restaurants	507	35	3,264	1,069	6	705
Total	669	38	4,678	1,424	7	963

* 36 projects did not have a project type listed

5.5.3 Trends in C&F Construction

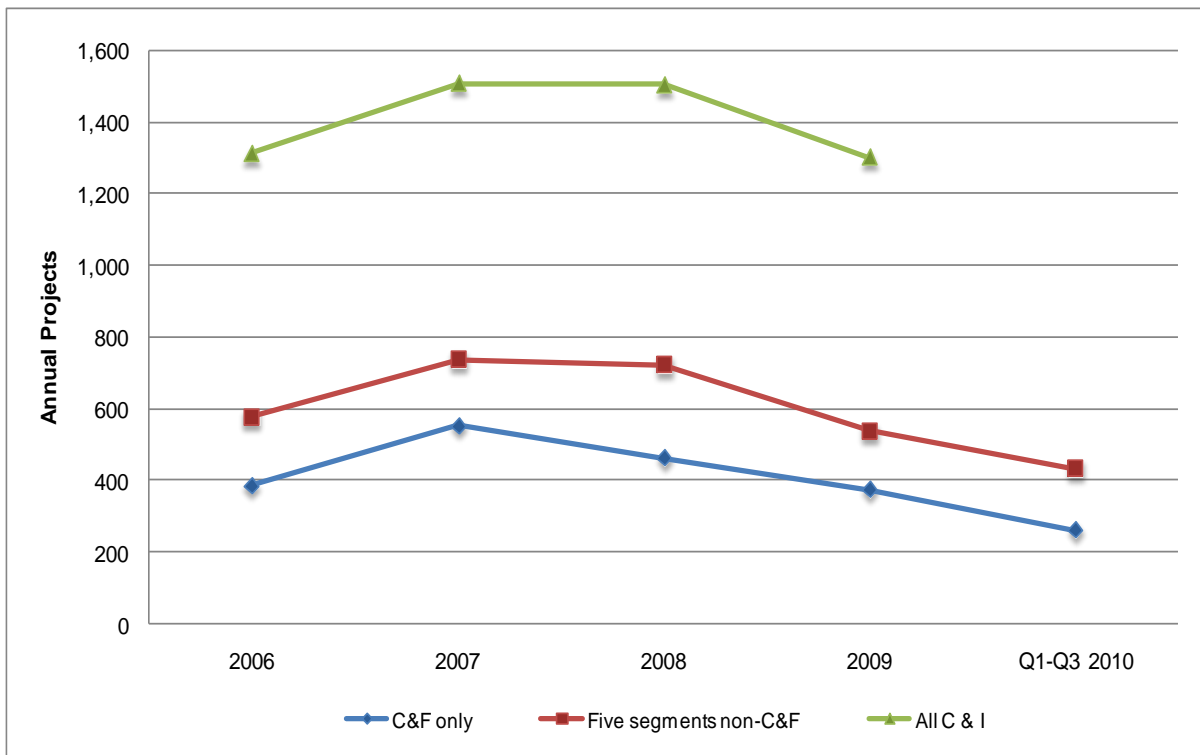
KEMA analyzed C&F construction over time to determine whether the sector presents any discernable trends. In this section we provided the following three views of the five year trend in C&F construction:

- **Aggregate construction trends** – Compared construction trends for C&F companies, all other firms from the five market segments from which C&F firms were identified, and all commercial and industrial (C&I) companies.
- **C&F construction by the five market segments** – Compared the five year trends in construction for each of the five C&F market segments.
- **C&F construction by project type** – Compared the five year trends in C&F construction by project type.

5.5.3.1 Aggregate construction trends

In Figure 5-5 we contrast the five year construction trends for C&F firms only with trends from non-C&F firms from the five market segments from which the C&F firms were identified. For comparison, we also considered construction trends for all Commercial and industrial industries (C&I). As we expected, the graph shows that construction peaked in 2007, which could be attributed to the sharp downturn in the economy. However, it appears that the C&F sector showed a sharper drop in construction from 2007 to 2008 than the remaining firms in the five market segments and all C&I firms. This may suggest that firms in the C&F sector constrained construction decisions across multiple branches or locations. It may also demonstrate that the C&F segment was more vulnerable to economic conditions than non-C&F firms, which is likely to be the result of the high concentration of retail firms in this segment. In addition, because many C&F firms had headquarters outside the state, their decisions were likely susceptible to economic conditions in states hit harder by the recession than Massachusetts.

Figure 5-5: Annual Construction Projects in Massachusetts

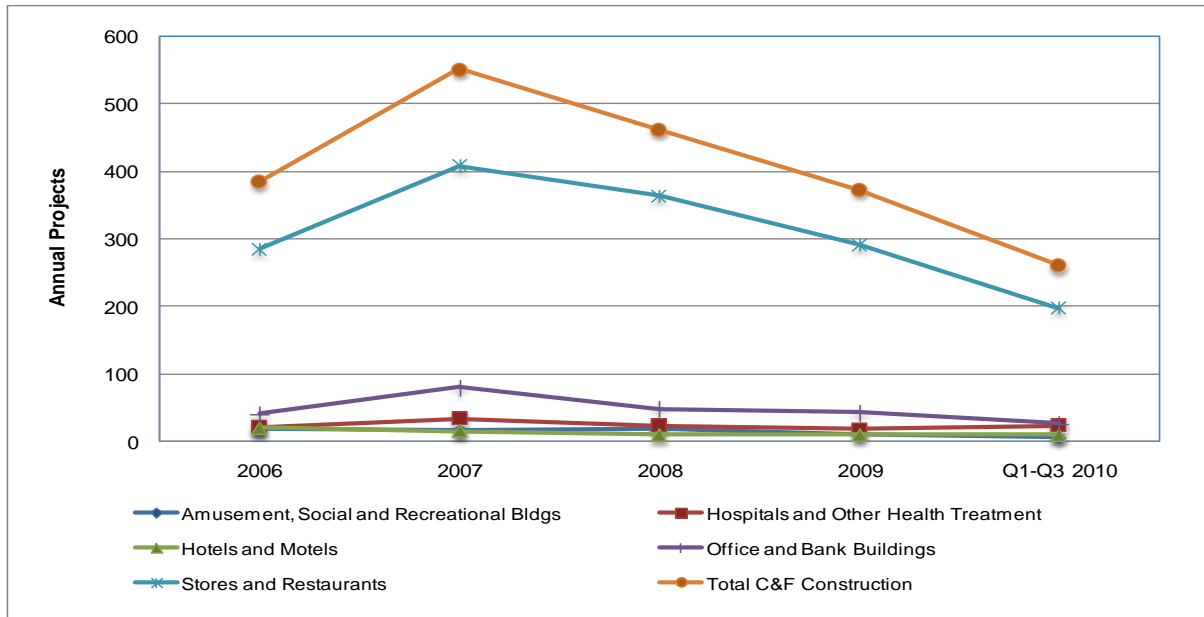


*2010 data for All C&I projects was unavailable. The 2010 number of projects for chains and franchises and the other sites in the five major market segments includes only Q1 through Q3 2010. This chart does not include a separate line for non-C&F "Five segments non-C&F," however they are included in "All C&I."

5.5.3.2 C&F Construction by the Five Market Segments

In Figure 5-6 and Table 5-11 we illustrate the impact that the high concentration of retail firms had on construction in the C&F sector. As the economy was still growing between 2006 and 2007, the retail market sector contributed to the substantial growth in construction from C&F firms. This trend is depicted by the second line from the top in graph. Stores and restaurants account for 74 percent of the C&F construction in 2006, which grew by 43 percent from 2006 to 2007. From 2007 to 2010 this segment showed a 51 percent decline in construction, whereas the decline in most other segments leveled off. Meanwhile, construction in the hospital and other health treatment sector actually began to increase over the past year.

**Figure 5-6: Massachusetts C&F Construction Projects-
by Market Segment and Year***



*The 2010 number of projects for chains and franchises includes only Q1 through Q3 2010.

**Table 5-11: Massachusetts C&F Construction Projects-
by Market Segment and Year**

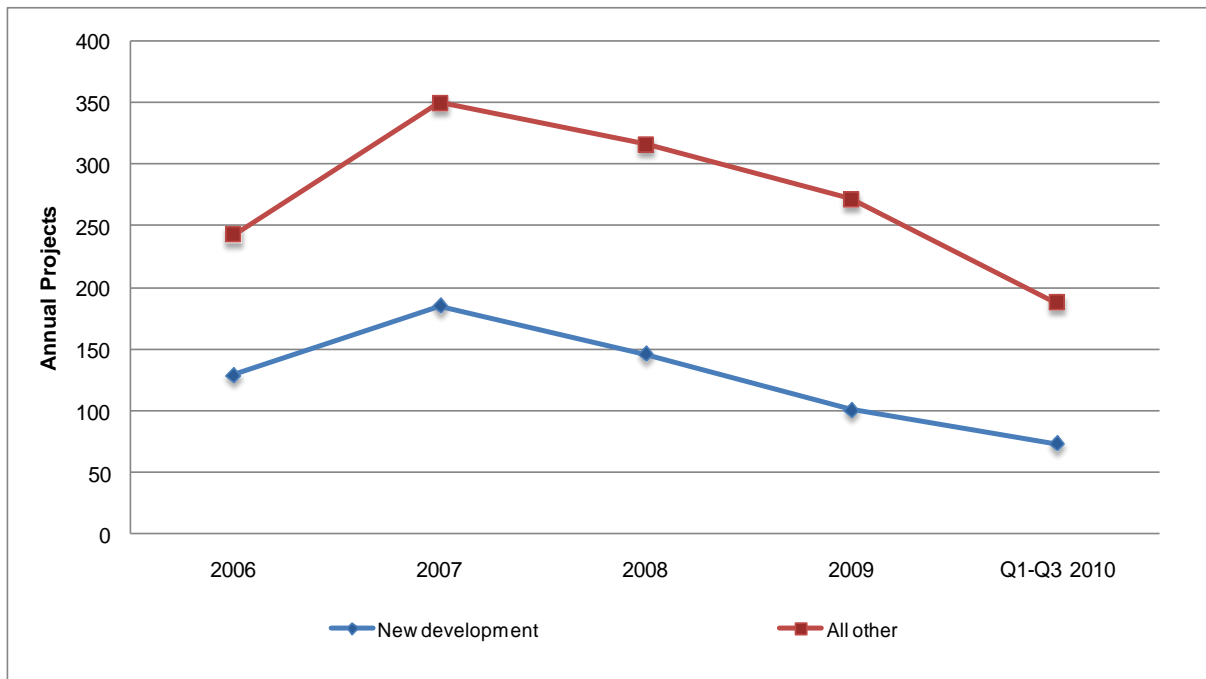
Market Segment	2006	2007	2008	2009	Q1-Q3 2010	Total
Amusement, Social and Recreational Bldgs	18	16	18	11	5	74
Hospitals and Other Health Treatment	21	33	23	18	23	124
Hotels and Motels	20	15	10	10	10	70
Office and Bank Buildings	41	80	48	43	26	256
Stores and Restaurants	285	408	363	291	197	1,604
Total C&F Construction	385	552	462	373	261	2,128

5.5.3.3 C&F Construction by Project Type

In Figure 5-7 and Table 5-12 we illustrate how new construction and alteration projects changed annually for C&F companies. Both project types followed the same trend as the overall C&F market, a peak in construction in 2007 with a decline each year following. However, the decline

in new construction started leveling off in the first three quarters of 2010 relative to projects that involve alterations and additions.

**Figure 5-7: Massachusetts C&F Construction Projects-
by Project Type and Year**



*The 2010 number of projects for chains and franchises and includes only Q1 through Q3 2010.

**Table 5-12: Massachusetts C&F Construction Projects-
by Type of Project and Year**

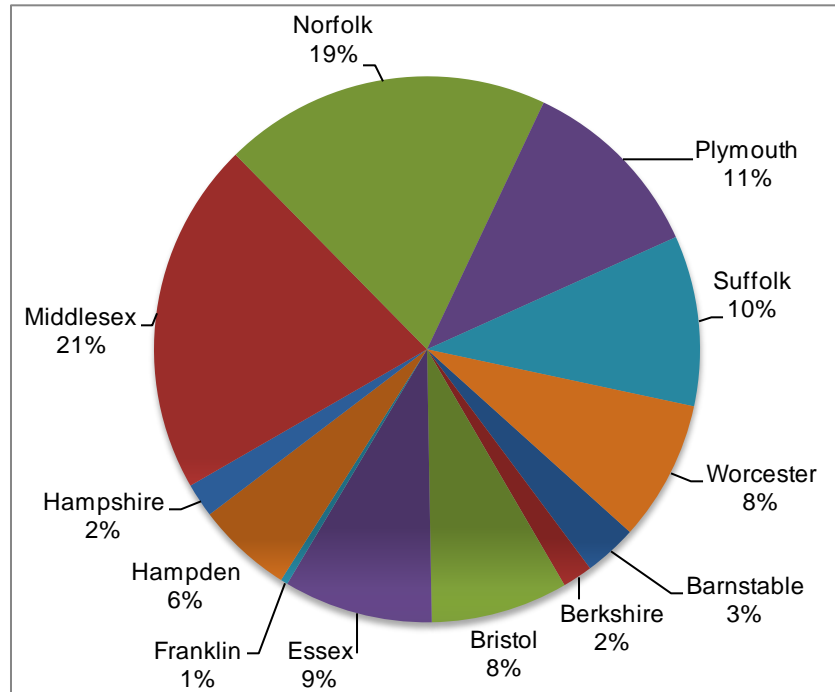
Year of Construction Update	New			Alteration or Addition			Total		
	Number of Projects	Total Area (1,000 sq ft)	Total value (\$thousands)	Number of Projects	Total Area (1,000 sq ft)	Total value (\$thousands)	Number of Projects	Total Area (1,000 sq ft)	Total value (\$thousands)
2006	129	5,546	670,277	243	2,414	312,708	385	7,973	984,577
2007	185	7,861	984,868	350	2,469	313,908	552	10,347	1,300,905
2008	146	4,316	479,471	316	2,279	303,249	462	6,595	782,720
2009	101	3,290	346,662	272	1,966	262,102	373	5,256	608,764
2010*	73	2,190	220,226	188	954	128,565	261	3,144	348,791
Total	668	25,147	3,129,269	1,424	10,488	1,370,849	2,128	35,671	4,504,644

*The 2010 number of projects for chains and franchises and includes only Q1 through Q3 2010.

5.5.4 Project by County

In this section, we analyze C&F construction projects by county in Massachusetts. First, we present the distribution and magnitude of C&F construction by county by reporting on the square footage and value of projects completed in each county. Then, we examine the distribution of new construction and alterations by county. In Figure 5-8 we show that 50 percent of C&F construction projects were performed in the greater Boston area - Middlesex, Norfolk, and Suffolk counties.

Figure 5-8: Massachusetts C&F Construction - by County



In Table 5-13 we show that these projects also represent 47 percent of the total square feet of construction work, and 59 percent of the total value of projects. C&F in Suffolk County spent over one billion dollars on construction work during the five year period of the analysis. These projects represent only 10 percent of all projects and 14 percent of total square feet, but 20 percent of the value of C&F construction activity. Outside the Boston area, only Plymouth County accounted for more than 10 percent of C&F construction projects.

**Table 5-13: Massachusetts C&F Construction-
by County**

County	Number of Projects	Percent of Projects	Total Square Feet (1,000 sq ft)	Percent of Square Feet	Total value (\$thousands)	Percent of Value
Middlesex	446	20.9%	6,266	17.6%	715,458	15.9%
Norfolk	413	19.4%	7,406	20.8%	937,441	20.8%
Plymouth	239	11.2%	3,688	10.3%	407,614	9.0%
Suffolk	215	10.1%	5,140	14.4%	1,021,909	22.7%
Essex	188	8.8%	3,345	9.4%	345,866	7.7%
Worcester	177	8.3%	4,204	11.8%	462,563	10.3%
Bristol	173	8.1%	1,698	4.8%	186,395	4.1%
Hampden	121	5.7%	1,400	3.9%	153,057	3.4%
Barnstable	67	3.1%	1,050	2.9%	127,179	2.8%
Hampshire	43	2.0%	966	2.7%	81,982	1.8%
Berkshire	38	1.8%	334	0.9%	43,520	1.0%
Franklin	9	0.4%	174	0.5%	22,010	0.5%
Total	2,129	100.0%	35,671	100.0%	4,504,994	100.0%

In Table 5-14 we show that in Barnstable, Franklin, Hampden, and Worcester counties, more new buildings were constructed for chains and franchises than alterations or additions. Meanwhile, Middlesex and Norfolk counties saw far more alterations than new construction.

**Table 5-14: Massachusetts C&F Construction-
by County and Project**

County	New	Alteration or Addition	N/A	Total
Middlesex	110	335	1	446
Norfolk	97	303	13	413
Plymouth	80	157	2	239
Suffolk	39	176	0	215
Essex	75	109	4	188
Worcester	93	81	3	177
Bristol	43	127	3	173
Hampden	70	46	5	121
Barnstable	31	31	5	67
Hampshire	20	23	0	43
Berkshire	6	32	0	38
Franklin	5	4	0	9
Total	669	1,424	36	2,129

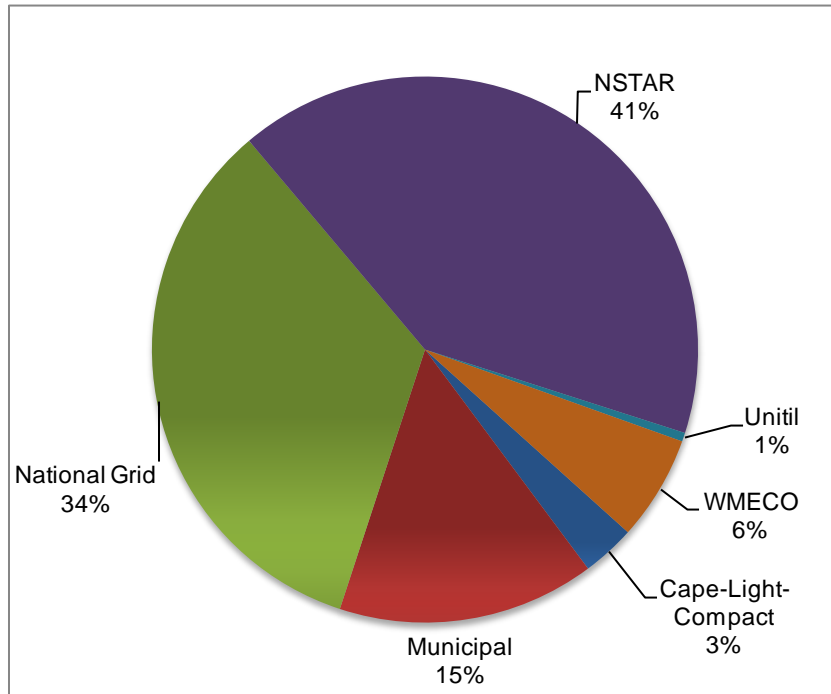
5.5.5 Projects by PA Service Territory

KEMA mapped each of the C&F locations contained in the Dodge data to their corresponding electric and gas PA. This section summarizes C&F construction by electric and gas PA service territory.

5.5.5.1 C&F Construction by Electric PA

In Figure 5-9 and Table 5-15 we present the distribution and magnitude of C&F construction projects by electric PA service territory. Roughly three quarters of projects were performed in NSTAR and National Grid electric service territories. These territories also account for over 75 percent of both the total square footage and value of construction in the C&F sector. An additional 15 percent of projects occurred in the various municipal territories.

**Figure 5-9: Distribution of Projects-
by Electric PA**



In Table 5-15 we show that most PAs saw more alteration work than new construction work. However, Cape Light Compact had the same number of alteration and new construction projects and WMECO actually had more new construction projects than alterations. This suggests that C&F's were focusing on building new locations in these regions over the past five years.

**Table 5-15: Summary of Projects by-
Electric PA and Type of Project**

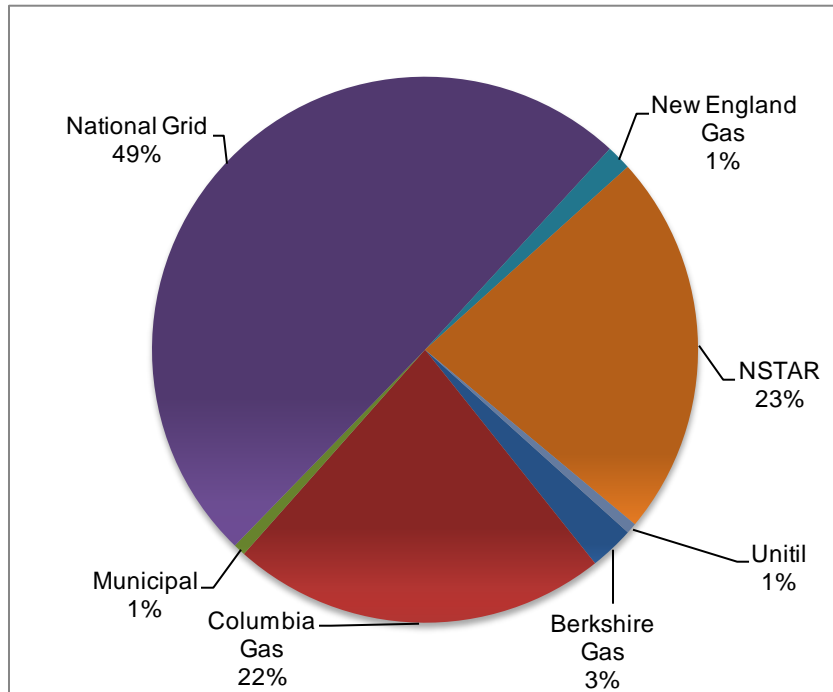
Electric PA	Number of Projects			Total Projects	Percent of Projects	Total Square Feet (1,000 sq ft)
	New	Alteration or Addition	N/A*			
NSTAR	161	709	4	874	41.1%	13,927
National Grid	297	407	15	719	33.8%	13,533
Municipal	106	210	8	324	15.2%	4,786
WMECO	70	58	4	132	6.2%	1,812
Compact	31	31	5	67	3.1%	1,050
Unitil	3	8		11	0.5%	547
Total	668	1,423	36	2,127	100.0%	35,671

* 36 projects did not list project type

5.5.5.2 C&F Construction by Gas PA

In Figure 5-10 and Table 5-16 we show the distribution of C&F construction by natural gas PA service territory. Thirty-nine sites did not list a gas PA and were thus excluded from this portion of the analysis. We found that roughly half of all projects were performed in National Grid's gas service territory. Another 45 percent of projects occurred in Columbia Gas and NSTAR's gas service territories. These three companies also represented roughly 95 percent of the square footage affected and total project value. Table 5-16 shows that all territories had more alterations than new construction.

Figure 5-10: Distribution of Projects by Gas PA



**Table 5-16: Summary of Project-
by Gas PA and Type of Project**

Gas PA	Number of Projects			Total Projects	Percent of Projects	Total Square Feet (1,000 sq ft)
	New	Alteration or Addition	N/A			
National Grid	292	727	17	1,036	49.6%	17,606
NSTAR	131	338	6	475	22.7%	8,034
Columbia Gas	195	259	11	465	22.2%	7,117
Berkshire Gas	17	38	0	55	2.6%	958
Gas	12	17	2	31	1.5%	620
Municipal	5	10	0	15	0.7%	88
Unitil	2	11	0	13	0.6%	547
Total	654	1,400	36	2,090	100.0%	34,970

* 36 projects did not list project type

5.6 Conclusions

In this section, KEMA presents a detailed profile of the chain and franchise (C&F) sector in Massachusetts, and discussed recent construction undertaken by those firms. Through analysis of the Dun and Bradstreet franchise file (D&B), we identified 4,739 unique C&F locations in the state. We analyzed those firms in terms of their market sector, size, and ownership structure. The D&B data also allowed us to identify key players within the state's C&F sector. Next, we presented our analysis of the Dodge Players database (Dodge data) which examined recent construction projects undertaken by C&F firms. We reported on the industry segmentation, magnitude, five year trends, and geographical distribution of those C&F construction projects. A summary of findings for both the population of C&F firms and construction performed by those firms are presented below.

5.6.1 C&F Population Findings

Key findings from the D&B data include:

- The D&B database provides a conservative estimate of the total size of the C&F sector of 4,739 locations.
- In terms of number of locations, the C&F sector is dominated by firms in the retail trade sector, as 73 percent are in that industry. Over half of firms in the retail sector consist of companies identified as eating and drinking places (34 percent of retail locations), and food stores (25 percent of retail locations). Retail trade has proportionately more C&F headquarters to individual locations than any other market segment, showing that many of these firms are individually owned franchises. This sector also has the largest average revenue per site. However, the transportation and public utilities sector has greatest number of employees per site, and the second largest revenue per site.
- We identified important differences in the ownership structure of firms. Roughly 75 percent of the 4,739 C&F locations are reported to be owned by the franchisee, and 62 percent of those franchisee owned firms are single (independent) locations. It is critical to determine the proportion of these firms that possess decision making authority over construction practices because this will directly impact the likelihood that the firms already have or are able to adopt energy efficient measures. If a company's construction and maintenance policies are constrained by corporate policy, those policies may already require that the individual locations have energy efficient

equipment. Other firms may be constrained by corporate policies that prevent adopting efficiency measures due to construction standards, cost constraints, or contractual obligations. Nearly all of the corporate owned locations are identified as branches.

- Only 23 percent of corporate owned C&F locations have a headquarters in Massachusetts, while 83 percent of franchise owned locations have a headquarter location within the state.
- The top five C&F companies in the state, in terms of number of locations, include Dunkin Donuts, CVS, McDonalds, Subway, and PapaGinos. The Big Y, Stop & Shop, and Shaws report the largest number of employees per location.

5.6.2 C&F Construction Findings

The Dodge Players' Database (Dodge data) provides a view of construction projects undertaken by firms in Massachusetts. We reviewed projects from five industry sectors identified as sectors with a relatively high concentration of C&F's. Based on the project descriptions and players (organizations associated with the project), we identified construction projects undertaken by C&F firms in the state. We summarize the findings from these data below:

- Stores and restaurants account for roughly 75 percent of construction projects undertaken by C&F firms and 69 percent of their square footage, but only 54 percent of the total value of work done. Hotels and motels account for only 3 percent of projects, but 24 percent of the total value of project.
- Alterations, renovations, and interior completions account for 64 percent of all construction performed by C&F locations.
- The trend in construction, in terms of number of projects, for the C&F sector shows a sharper drop from 2007 to 2009 than the non-C&F firms from the five sectors from which C&F firms were identified and also compared to all C&I construction. This sharper decline is likely due to the high concentration of retail stores and particularly, food service firms. The trend may also indicate that construction decisions for individual C&F firms are centralized at headquarters or parent companies. Therefore, a policy of more or less aggressive growth will be reflected in multiple locations rather than each facility separately.

-
- Firms in the Boston area account for 50 percent of C&F construction over the past five years. Firms located in NStar's electric territory account for 41 percent of all projects and those in National Grid's electric territory accounted for 34 percent of all projects. However, looking at the distribution of projects by gas utility territory presents the reverse outcome. Projects in National Grid's gas territory account for 49 percent of all activity, while NStar's account for 23 percent.

6. National Account Manager Interviews

6.1 Introduction

This section presents the results of in-depth interviews with PA national account managers. Key topics explored in the interviews include C&F building characteristics, energy efficiency decision making, participation in energy efficiency programs, and free-ridership.

The national account manager interviewees were identified by PA evaluation staff. In total, eight individuals were interviewed from five PAs.

The remainder of this section describes the research objectives and sampling plan.

6.1.1 Objectives

The objective of the national account manager interviews was to provide a solid foundation for understanding the market structure and decision-making process of the C&F customers in Massachusetts. In addition, these interviews served as a vehicle to obtain contact information for the C&F management interviews.

Below are the key questions explored in the national account manager interviews:

- What are the key building characteristics that affect energy consumption and efficiency for the various types of C&F facilities in the population?
- Who makes decisions regarding energy efficiency – corporate staff, local management, consultants or vendors? Does this vary by chain vs. franchise?
- How often does the account manager interact with the C&F decision makers?
- Which C&F customers participate in programs? New construction or retrofit? Which measures are most common?
- Which C&F customers do not participate in programs? Why not?
- What issues are unique to C&F that may influence their participation?
- How can the PAs increase program participation in this sector?

- What is the account manager’s assessment of the level of free-ridership within this sector?
- At what point in the new construction/retrofit process do account managers tend to become aware of the construction/expansion?
- Who is the appropriate person to interview at C&F management? Obtain their contact information.

6.1.2 Sampling Approach

The LCIEC team set out to complete six in-person interviews with national account managers at their offices. However, distance and schedule constraints made in-person interviews difficult for some of the respondents. The team requested in-person interviews from the contacts located in eastern Massachusetts, and telephone interviews from contacts located outside of eastern Massachusetts. The national account manager interviewees were identified by PA evaluation staff.

In total, eight individuals were interviewed from five PAs. This accounts for the majority of PA account representatives responsible for National Account customers. For example, we interviewed two of two National Account Representatives at National Grid. Four respondents were interviewed in person and four were interviewed over the telephone. Table 6-1 displays the number of interviews and method of interview.

**Table 6-1: Number of Interviews-
by PA**

Program Administrator	Number of Respondents	Interview Method
National Grid	2	1 In person, 1 Telephone
Cape Light Compact	2	In person
Columbia Gas	2	Telephone
Unitil	1	Telephone
New England Gas	1	In person
Total	8	N/A

6.2 Summary of Key Findings

Key findings from the national account manager interviews are summarized below. Due to the small sample size, all findings should be viewed as qualitative in nature.

6.2.1 Customer Characteristics

- According to interviewees, C&F customers tend to be larger and more energy intensive than similar, non-C&F customers. Additionally, several interviewees noted that the grocery sector tends to use more energy than other sectors, due to its refrigeration needs.
- The individuals with whom national account managers interact at C&Fs are more likely to be located outside of Massachusetts, as compared to non-C&Fs. In addition, the responsibilities of these C&F contacts are generally narrower than contacts at non-C&F customers.
- C&F customers are more likely than non-C&F customers to initiate contact with national account managers regarding energy efficiency programs.
- National account managers usually become aware of their C&F customers' retrofit projects after customers have decided to upgrade equipment but before the project is underway. National account managers generally become aware of new construction projects in the design and development stage when C&Fs are beginning to work through the permitting process.

6.2.2 Decision Making

- The individuals with whom national account managers typically interact at C&Fs generally play an advisory role regarding customers' decisions about equipment purchases and new construction, but are usually not the final decision makers. Final decisions are usually made by corporate vice presidents at C&Fs, including vice presidents of finance.
- Architecture firms play an advisory role in energy efficiency decisions within the retail sector, and marketing staff may be particularly influential in the grocery sector.

- All customers typically replace lighting systems during remodeling projects, though C&Fs are more likely to replace other systems such as HVAC and control systems, in addition to lighting.
- According to the national account managers, the primary considerations for C&F customers when selecting equipment for retrofit or new construction projects are upfront costs, product presentation and quality, energy efficiency, and energy savings.
- C&F customers required payback period depends, to a certain extent, on the magnitude of the upgrade, whether the facility is owned or leased, and the expected lifecycle of the new equipment.
- Most of the national account managers' C&F customers have corporate energy efficiency guidelines in place. With the exception of the grocery sector, these guidelines are often general and it is not clear whether they provide guidance in selecting the efficiency level of equipment to install.
- C&F customers tend to be more aware of current codes and standards than non-C&F customers, likely because they have more staff and have gained experience learning various local codes and standards as a result of building in different areas of the country.

6.2.3 Program Participation

- C&Fs within the grocery, healthcare, and retail sectors may be more likely to participate than those in other sectors. Higher participation by the grocery and healthcare sectors is likely due to higher energy usage and increased likelihood of having fulltime energy managers on staff. C&F restaurants appear to be least likely to participate in energy efficiency programs.
- The national account managers hold different perspectives regarding whether C&F customers are more or less likely to participate in new construction projects versus retrofit projects. Several interviewees reported that C&F customers were equally likely to participate in both new construction projects and retrofit projects. However, two respondents pointed out that restaurant franchises are constrained by how much they can deviate from construction specifications.
- C&F customers are most likely to obtain program incentives for lighting technologies. There are indications that C&Fs are more likely than non-C&Fs to upgrade HVAC systems and controls.

- Some national account managers reported that free-ridership was higher among C&F customers, while others indicated that there was no difference between C&F and non-C&F customers. Two respondents reported that free-ridership was higher among the retail sector as compared to other C&F sectors, and one reported that free-ridership was higher among the grocery sector. Additionally, one interviewee suggested that free-ridership was higher among the larger C&Fs than the smaller ones due to the greater level of knowledge within larger organizations.
- According to interviewees, C&F customers choose not to participate in energy efficiency programs because the process and paperwork requirements are burdensome and due to a lack of program awareness. Additional reasons cited include limited capital and staff resources, ineligible projects, and insufficient heating costs to warrant investment. The national account managers were generally in agreement that the reasons why C&F customers do not participate are the same as those of similar non-C&F customers, although barriers may be steeper for non-C&F customers.
- Factors influencing participation for C&Fs include the challenges of working in different states, offsite decision making, as well as the greater availability of capital for energy efficiency investments and the greater potential for energy savings.
- Interviewees offered a variety of suggestions for increasing program participation by C&Fs, including incorporating more prescriptive measures, further simplifying the application process, ensuring that C&Fs are sufficiently familiar with qualifying project components, increasing outreach to C&F decision makers, tailoring programs to individual C&F sectors, and continuing to offer on-bill financing.

6.3 National Account Managers' Roles and Responsibilities

The eight individuals interviewed for the national account manager interviews serve as the primary point of contact for large C&I energy efficiency programs. The roles and responsibilities of these eight individuals vary depending on the organizational structure of the PA each represents. Four of the respondents work with both C&F and non-C&F customers. They have a range of responsibilities in addition to energy efficiency projects, such as handling billing disputes, power quality issues, service requests, and/or attracting new customers to their service territories. The two national account managers interviewed from National Grid work primarily with national chains and franchises on energy efficiency projects, and each specializes in certain sectors. Additionally, the role of the two Cape Light Compact (CLC) staff members interviewed is to promote and facilitate energy efficiency programs for C&I customers, including

both C&F and non-C&F customers. Aside from the two National Grid account executives, most of the interviewees work with all sectors of C&I customers located within their territories, including retail, restaurant, grocery, lodging, healthcare, manufacturing, educational institutions, and municipalities. Some are responsible for their organization's entire service territory, while others serve only a portion of the territory. While only the two National Grid interviewees work exclusively with national accounts, all eight interviewees are referred to as "national account managers" in this report because they serve as the primary point of contact for large C&I energy efficiency programs.

National account managers are responsible for a variety of tasks for retrofit and new construction energy efficiency projects, including assisting customers in identifying opportunities for projects, reviewing applications, attending pre- and post-inspections, facilitating information flow with third-party contractors and engineers, coordinating with subcontractors that deliver the program, and delivering incentive checks to clients. One interviewee described his role regarding the large C&I energy efficiency programs as follows:

To understand our programs, communicate those programs to our customers, look for opportunities to implement those programs during site visits, pre- and post-inspections, meet with them initially to make them aware of the programs, and actual processing of applications.

The national account managers interact with energy efficiency program staff on either a weekly or daily basis about issues such as incentive approval and delivery, clarification of program requirements and qualifying products, technical review requests, and to encourage the standardization of new program measures.

6.4 C&I Customers

6.4.1 Facility Ownership, Size, and Energy Consumption

Tenure. Two interviewees reported that they did not perceive any systematic differences between their C&F and non-C&F customers with respect to owning versus renting their facilities. One commented that chains typically lease while non-chains oftentimes own the property they occupy, and another stated that large chains tend to own their facilities whereas smaller franchises tend to rent. Interviewees who have worked with grocery chains reported that they tend to own their facilities. Those who have worked with retailers typically located in malls reported that they tend to rent the spaces they occupy.

Energy Use. Some interviewees noted that their C&F customers tend to use more energy than their non-C&F customers because the C&F customers tend to be larger. One summarized this observation as follows: “The chains and franchises are larger square footage wise and more energy intensive. They tend to be the bigger customers. The Super Stop & Shop is huge.” Additionally, several interviewees noted that the grocery sector tends to use more energy than other sectors due to its refrigeration needs.

6.4.2 C&I Contacts’ Roles, Responsibilities, and Location

The job titles of the C&F employees that national account managers typically interact with include facilities directors/managers, energy managers, store managers, general managers, and in the case of smaller franchises, owners. For their non-C&F customers, interviewees typically interact with owners or facilities personnel. Interviewees stated that their C&F contacts report to operations managers, plant managers, regional managers, and vice presidents, such as vice presidents of facilities or real estate. According to the national account managers, facilities directors, energy managers, and some facilities managers at the chains and franchises are responsible for multiple sites, while store managers and general managers are generally responsible for only one facility. Some national chains have one energy manager who is responsible for the entire country, while other national chains have several regional energy managers. Interviewees reported that most of their non-C&F contacts are located in Massachusetts, whereas fewer of their C&F contacts are located in Massachusetts. An interviewee who works with national grocery and restaurant chains stated that the majority of these chains’ contacts are located outside of Massachusetts.

Interviewees reported that energy managers of large chains are primarily responsible for managing energy costs. In contrast, facilities managers tend to be responsible for all systems in a facility, including plumbing, mechanical, HVAC, and electric systems. Depending on the particular C&F, the responsibilities of the national account managers’ contacts may be as narrow as energy cost control, or as broad as management of the overall stores, including electricity, gas, phones, water, and/or garbage disposal. The responsibilities of the national account managers’ non-C&F contacts are generally broader than those at chains and franchises. One interviewee summarized the responsibilities of his non-C&F contacts as follows: “They’re responsible for all of the facets of the business.”

6.4.3 Interaction and Communication

The frequency with which the national account managers interact with their C&F customers varies, ranging from as little as twice per year to daily. One interviewee explained that the frequency of communication regarding energy efficiency programs with all types of C&I customers varies depending on the size of the customer, the spectrum of responsibilities the individual responsible for energy related decisions has, the customer's level of experience with energy efficiency programs, and the sector in which the customer operates. For example, this interviewee stated:

It depends on how needy the customer is. Bigger national chains need less handholding because they're so familiar with these processes because they've done it in so many places. Some of the smaller ones, if we're talking with the owner, the owner has so many other operational things in mind, including "Is my occupancy high? Am I selling enough per square foot in grocery and retail?" Energy efficiency they need to be walked through, baby step by step. Interaction with the grocery sector is more frequent than other chain and franchise sectors [because] there's more opportunities there because their end uses are more broad and they're the most energy intensive of those sectors.

Another interviewee reported that C&F customers are more likely than non-C&F customers to initiate contact regarding energy efficiency programs:

If it's a chain or franchise, they call me. If it's not, I call them...They know there's money out there and they'll go get it. That's one of the significant differences – you don't really chase them, they know your number. 1-800-I WANT MY INCENTIVE.

National account managers usually become aware of their C&F customers' retrofit projects after customers have decided to upgrade equipment, but before the project is underway. Several interviewees explained that they typically become aware of projects to replace equipment, such as lighting, HVAC, or motors, when C&F customers contact them to inquire as to what incentives are available. Interviewees reported first becoming aware of projects during engineering studies, after the specifications have been completed, and before vendors have been selected or before the project has gone out to bid. One national account manager reported learning about customers retrofit projects during annual meetings with C&I customers. National account managers generally become aware of customers' new construction projects in the design and development stage. For example, one interviewee reported learning of C&F customers' new construction projects after they have purchased property and are beginning to

work through the permitting process. Another interviewee learned of chain and franchise customers' new construction projects through lists sent by customers:

I usually get a list from them twice a year of what's going on. Early this year I got lists from some of my customers as to what new construction is going to be going on, what month and so on. I usually know before they break ground.

About half of the national account managers interviewed did not identify any characteristics unique to chains and franchises that influence the way national account managers communicate and interact with them. Of those who did identify characteristics unique to chains and franchises, one commented that they need less "handholding" because they are more familiar with technical terminology and program requirements, another stated that they are more likely to be aware of programs due to their larger size and ability to attend conferences, and a third mentioned more frequent communication with C&F customers, due to the fact that they have multiple sites and are therefore more likely to be in contact for billing and other issues. This interviewee indicated that the increased communication with C&F customers leads to a closer business relationship.

6.5 Decision Making

6.5.1 Decision Makers

Interviewees' C&F contacts generally play an advisory role regarding customers' decisions about equipment purchases and new construction. These individuals may be involved in activities such as identifying facilities for upgrade, reviewing proposals, calculating return on investment, and selecting vendors to perform upgrades, but are usually not the final decision makers. When asked about their contacts' role in C&F customers' decisions regarding equipment purchases and new construction, one interviewee who works with large retail chains explained:

Most of the big companies are going to have an architecture firm that's going to be making recommendations as to what equipment they would want to put in their stores. It takes a long time for them to ... change what they're doing. But it seems like lately they've been changing a lot quicker as far as going to the next level of efficiency.

Another who works with grocery chains indicated that marketing staff are particularly influential in decisions regarding energy efficiency projects:

In the case of supermarkets, the marketing group has a big say in whether things go or don't go in terms of how it might affect the image of a product or the ease of obtaining the product. For example, in the supermarket area you'll notice in some cases they'll have a reach-in open refrigerating case for milk, well the milk's on a large cart with various rows. Behind that cart is an open, walk-in cooler. There's a significant energy savings if they simply add doors to that open case; they'll save about 60-70 percent of the energy, and the energy folks that I deal with want to do those upgrades, but the marketing folks in the supermarket chains have been reluctant to do that, thinking that it may inhibit sales activity associated with those products.

The national account managers reported that the final decision maker for equipment purchases and new construction is often a corporate vice president. One interviewee stated that if a chain has an energy manager, it is the energy manager who makes final decisions regarding energy efficiency projects. Another stated that if a chain has corporate engineering staff, then the final decision is often made within the corporate engineering staff. Two interviewees stated that final decisions are typically made by financial staff, such as purchasing directors or vice presidents of finance.

6.5.2 Types of Systems Customers Replace

The majority of the national account managers reported that C&F customers typically replace lighting systems during remodeling projects. In addition, many interviewees reported that C&F customers typically replace HVAC systems and a few mentioned that C&F customers typically replace control systems during remodeling projects. Interviewees who work with grocery chains reported that these customers often replace refrigeration systems. One national account manager who works with restaurant chains observed that although kitchen equipment (including fryers and broilers) are covered by the program, restaurant chains do not often upgrade kitchen equipment.

Several national account managers who work with both C&F and non-C&F customers noticed that their non-C&F customers typically replace lighting systems only, while chains and franchises are more likely to replace other systems in addition to lighting during remodeling projects. However, another interviewee commented that non-C&F customers replace "only what they absolutely have to." One respondent summarized the difference between C&F and non-C&F energy efficiency projects as follows:

Chains and franchises typically have whole projects in mind. They are more comprehensive, where the non-C&Fs are looking at, "What gives me the quickest

payback?” For instance, chains and franchises might do lighting for its quick payback, but they also might consider something with a longer payback and mix it, so that as a project it has an attractive payback or ROI.

6.5.3 Primary Considerations in Equipment Selection

According to the national account managers, the primary considerations for C&F customers when selecting equipment for retrofit or new construction projects are upfront costs, product presentation and quality, energy efficiency, and energy savings. Several interviewees mentioned that their C&I customers would not install efficient lighting if they believed it would compromise product presentation. Other considerations mentioned by interviewees include equipment reliability, familiarity with equipment, and lower maintenance costs.

National account managers reported that their C&F customers require a payback of between one-and-a-half and five years, depending to a certain extent on the magnitude of the upgrade, whether the facility is owned or leased, and the expected lifecycle of the new equipment. An interviewee who frequently works with grocery, restaurant, and hospitality chains and franchises indicated that a one-and-a-half to two-year payback is typically required, but in some cases customers will consider a three-year payback for significant equipment upgrades. Another who works with national retail chains stated that many customers seek a two-year payback but are increasingly accepting three- to five-year paybacks, particularly in cases in which customers own their facilities or the lifecycle of an efficient lighting technology is four to five years and the customer anticipates upgrading again at the end of the lifecycle.

National account managers who work with both C&F and non-C&F customers were divided on the topic of the payback requirements of non-C&F customers versus chains and franchises. For example, one interviewee suggested that non-C&F customers typically have a longer stake in their facilities and therefore can allow for a longer payback. However, another interviewee asserted that this customer group has shorter payback requirements and exemplified this viewpoint by recalling a situation in which a large non-C&F customer refused a project with less than a one-year payback because it was not “good enough”.

6.5.4 Corporate Energy Efficiency Guidelines and Codes and Standards

The majority of the national account managers reported that most or all of their C&F customers have corporate energy efficiency guidelines in place. However, none were able to describe the guidelines in any detail and it is not clear whether the guidelines provide guidance in selecting the efficiency level of equipment to install. One interviewee indicated that her C&F customers’

energy efficiency guidelines were general and covered things such as switching off the lights when employees leave and switching a certain percentage of lights off while restocking shelves. When asked what the guidelines specified, this interviewee responded:

It would be more general. It wouldn't be, "We want to put in only this particular type of light bulb with this particular color rendering index and whatever wattage". It would be more general, it would be more like "We want to pick the most energy efficient product for that purpose."

Another interviewee stated that large grocery chains typically have a policy on energy efficiency and believes that these policies are heavily influenced by PA program incentives:

I'd say the large, national supermarkets typically have a policy on energy efficiency. I'm sure through the process of understanding what utilities offer and what guidelines utilities require to achieve those rebates - which affects their payback and cost - then I'm sure that if they do have policies its probably tailored around what programs are offered. I'd say it covers anything energy-related. Typically you'll find in the national accounts, they'll incorporate similar equipment in their facilities once they standardize on a particular product. I think it's driven by our programs more than anything else.

The majority of the national account managers agree that their C&F customers tend to be more aware of current codes and standards than non-C&F customers. This is probably because C&F customers have more staff available and they need to learn various local codes and standards as a result of building in different areas of the country.

6.6 Program Participation

The national account managers were asked which C&F customers were most likely to participate in energy efficiency programs and why. Numerous interviewees responded that the C&F customers with higher energy loads were most likely to participate. Others responded by naming sectors, including the grocery, healthcare, and retail sectors. Higher participation by the grocery and healthcare sectors was attributed to higher energy usage and increased likelihood of having fulltime energy managers on staff. One interviewee stated that C&F customers with facilities located in free-standing buildings were most likely participate, naming several large chains including Wal-Mart, Lowes, Walgreens, and CVS. One interviewee replied "all of them" when asked which C&F customers were most likely to participate in energy efficiency programs, and then stated:

The business has matured enough that everybody's aware that there's got to be

some kind of a program. They may not know exactly what it is, but they know that there's something out there. And for the chains and franchises that are out in the marketplace, they've got staff that all they do is chase around and find out who's got programs and who doesn't and what the programs entail. And the fact that most of the utilities have everything available online makes their job easier because they are hopping online and going out and getting all the info, right to the point of downloading applications and sending the applications to us saying, "Hey, we've got this project going. Here's our application."

Two interviewees commented that their restaurant C&F customers were least likely to participate in energy efficiency programs. One compared the restaurant sector to the grocery sector in order to explain the lower level of participation by restaurant chains:

There's a limited number of people you're dealing with in each supermarket chain. They know the utility and the utility knows them, so they develop a relationship and the communication link is there. So it's a matter of communication: finding the time to get back to the different [restaurant] franchise owners, finding out who they are and getting involved with them...I'd say the smaller restaurant chains are more of a challenge, where you have more people and they don't have the staff to focus on specific things until something breaks.

The other respondent offered the following explanation for the low level of participation by restaurant chains and franchises:

Because of the standardization of design, selection of one brand and one type of equipment, and the fact that if a piece of equipment goes, they tend to just put the same thing back in without giving too much thought to any energy efficiency improvements.

6.6.1 New Construction and Retrofit Programs

The national account managers offered varying perspectives with regards to whether C&F customers were more or less likely to participate in new construction projects versus retrofit projects. Several interviewees reported that C&F customers were equally likely to participate in both new construction projects and retrofit projects. Two pointed out that restaurant franchises are limited in the amount by which they can deviate from construction specifications which are corporate driven and are intended to maintain a particular style. Some interviewees identified C&F sectors which they believe are more likely to participate in either new construction or retrofit programs. For example, one respondent who assists customers with gas energy efficiency programs stated:

I think institutional healthcare will be most likely to do retrofit. Big box retail and restaurants tend to be least likely to do retrofit. And new construction, I haven't seen a lot of participation by any market segment in reaching out to determine what if any incentives are available to them for making certain equipment choices or building to certain energy efficiency standards structurally on the building. Though I think that's changing now with emphasis on green technology, getting buildings LEED certified or ENERGY STAR certified, but typically involves outreach first on the part of the utility to make the architect involved aware.

Another who works with both gas and electric energy efficiency programs commented: "You might see restaurants more willing to participate on new construction."

6.6.2 Energy Efficient Technologies

The national account managers were asked to identify which technologies C&F customers were more or less likely to obtain program incentives when compared to non-C&F customers. Interviewees that work with customers on electric energy efficiency projects were in agreement that C&F customers are most likely to upgrade lighting technologies over other technologies. One interviewee who works with both C&F and non-C&F customers responded:

Everybody does lighting. I'd say the chains are far more focused on environmental systems and controls, HVAC, building automation systems, motors that go along to support that.

Another respondent who works with both C&F and non-C&F customers on gas energy efficiency projects responded: "I would say controls and lighting. HVAC is probably standard across both."

A third interviewee who works with both C&F and non-C&F customers on gas energy efficiency projects observed that retail chains were least likely to install higher efficiency heating and water heating measures:

For new construction, I can tell you when some of these major pharmacies are built, the CVS's, Rite Aid's, Walgreens - I don't want to speak for them - but quite often they'll go in with the minimal standards on things like hot water. They'll put in basically a small instantaneous water heater so that customers can wash their hands, nothing fancy. Heating, they'll go with split roof top systems which aren't energy efficient. Looking at their energy load on the gas side, the costs to heat these buildings are not that great. I would say if they wanted to, they could go with some deep energy savings, putting in super insulation, but a lot of these buildings, they meet the minimal energy code and that's it. Some of these major chains, it's not a high priority to do a green type of building.

6.6.3 Free-ridership

The national account managers were asked whether the level of free-ridership for C&F customers is lower, higher, or the same as similar non-C&F customers. Interviewees were provided with the following definition of a free rider: a program participant that would have installed the same energy efficient measure at the same time in the absence of the program. Some national account managers reported that free-ridership was higher among C&F customers, while others indicated that there was no difference between C&F and non-C&F customers. Due to the complicated nature of free-ridership, the interviewees provided their insight as best they could. The topic of free-ridership gave rise to the following responses:

That's a tough one. I think the chains do tend to be free riders. However, I think they get greater penetration in the energy efficiency side of things because the programs are there. Let me explain a little bit; I think the chains are going to find the most cost-effective way to do what they need to do. That may mean that they are going to be putting in cheap equipment, but they also recognize that there is value to energy efficient equipment, so they may get the cheapest energy efficient equipment they can, whereas with the programs in place they may upgrade a step or two. So for a minor incremental cost increase they'll get substantially more energy efficiency and greater longevity through the upgraded equipment. I think they're going to install energy efficient equipment anyway. In most cases its code, somewhere. But I think because of the programs we probably get a little bit more penetration and a better savings in the market.

I have to say, my customers - when they take into consideration any kind of technology that's part of it - they take into consideration if there's incentives available and they build that into their model because they need a certain payback in order to make it worth their while to switch. If you talk to them, that's just what they're going to tell you: "We don't do anything without taking everything into consideration." These guys are pretty savvy. When they sit down and figure out what the payback's going to be, that incentive plays in big time. Everything does; the cost of the product, the maintenance on the product. "How many hours is that light going to burn?" "How often do I have to go in and re-lamp?" Those kinds of things. They take all that into consideration before they make the decision to switch from one technology to another.

[Free-ridership] is higher for chains and franchises. If it is a corporate mentality to be more energy efficient, then we aren't incenting them to do anything. That's their corporate mantra and our dollars are going towards something that would happen anyways.

Put it this way: I just mentioned that they are knowledgeable of efficiency, they're knowledgeable of measures, but that doesn't mean they're going to go forward on

projects without the incentives. I think that factor puts them in a different category, or similar to other customers. Even though they have the knowledge base, it's still a matter of payback; it's a matter of costs. And then they may in fact do things in utility areas that they haven't done in other areas. The rebate is a big factor.

Just a comment on free-ridership. The thing you have to be careful on free-ridership is that, first of all, even on new construction, we have an on-staff architect that promotes energy efficiency to architects, so obviously as architects learn more about energy efficiency, energy efficient equipment, and the utility programs, they're going to start incorporating energy efficiency equipment in the new construction design, with our participation and sometimes without. So we, in fact, we're influential in incorporating those energy efficiency measures with that new construction project and with that customer. Now that same customer that's learned about those measures through a new construction project ultimately performs some retrofits on his existing facilities as well, incorporating that knowledge that we brought to bear. That's a thing that some might view as a free rider, but yet on the other hand it was part of the utility program at one point. So that's why it's getting a little more difficult I think to interpret free rider than the way perhaps it used to be, because there's still an element of influence in there that's come to bear.

For new construction they build to standards. But if they don't get an incentive they won't go with the higher. For example, the roof top units, if there's not an incentive for them to go to a 15 EER they'll put in 10 or 11, whatever is code. They'll do code because they're not going to get that incentive funding that helps them pay that upfront cost. And in new construction that's the big cost anyway.

National account managers were asked to describe how the levels of free-ridership among chains and franchises vary. Two reported that free-ridership was higher among the retail sector as compared to other C&F sectors, and one reported that free-ridership was higher among the grocery sector. Additionally, one interviewee suggested that free-ridership was higher among the larger chains and franchises than the smaller ones due to the greater level of knowledge within larger organizations.

6.6.4 Barriers to Participation

The national account managers were asked why C&F customers decide not to participate in programs. Interviewees suggested various reasons for not participating, including the following:

- The perception that program participation is a difficult process and that the paperwork requirements are burdensome (four respondents)

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- Lack of awareness that programs exist (two respondents)
 - Insufficient staff to fill out different applications for different PA's in the case of national chains with multiple facilities (one respondent)
 - Financial reasons such as limited capital (one respondent)
 - A C&F customer's proposed project doesn't qualify (one respondent)
 - The heating costs for certain retail chains are not sufficient to warrant the investment in higher efficiency heating equipment (one respondent)

The national account managers were generally in agreement that the reasons for C&F customers not to participate are the same as those of similar non-C&F customers. Several commented that C&F and non-C&F customers alike face the same barriers, such as time and financial limitations. However, some pointed out that non-C&F customers are less likely to be aware of the programs, less likely to have the financial resources for energy efficiency improvements, and/or less likely to have the staff resources than C&F customers. In other words, C&F and non-C&F customers face the same types of barriers, but the barriers are often steeper for non-C&F customers.

6.6.5 Participation Factors

When asked if there are any issues unique to chains and franchises that may influence their program participation, the national account managers brought up several issues, most of which result from the operation of multiple facilities:

- Challenges of working with multiple programs in different states, such as different program requirements (two respondents)
- Greater availability of capital for energy efficiency investments (one respondent)
- Greater potential for energy savings (one respondent)
- Offsite decision making (one respondent)

Finally, the national account managers were asked for suggestions as to how the PA's can increase program participation in the chain and franchise sector. Several pointed out that the recent implementation of common statewide application forms, terms, and conditions was a

significant step forward towards increasing participation among chains and franchises. One interviewee questioned whether it was necessary to increase program participation by chains and franchises: “Well, do we need to? I mean history shows they are usually the first at the gate when they’re doing something.”

Interviewees offered a variety of suggestions for increasing program participation in the chain and franchise sector, which are summarized below:

- Incorporate more prescriptive measures (two respondents)
- Further simplify the application process (one respondent)
- Ensure that chains and franchises are sufficiently educated as to qualifying project components (one respondent)
- Step up outreach by national account managers to corporate and franchise decision makers (one respondent)
- Advertise to franchisees through direct mail pieces, emails, and tradeshow (one respondent)
- Tailor programs to individual sectors (i.e. retail, restaurant, etc.) and promote to individual sectors through the use of case studies (one respondent)
- Continue to offer on-bill financing (one respondent)

7. Interviews with C&F Management

7.1 Introduction

This section presents the results of 21 in-depth telephone interviews with C&F managers.

The following describes the research objectives and sampling plan.

7.1.1 Objectives

The objective of the interviews with C&F management is to provide insight and understanding into the decision-making process of C&F customers in Massachusetts. C&F decision makers were asked questions regarding decision-making processes, corporate policies, and the level of program influence. These in-depth telephone interviews were conducted in March and April of 2011.

The interview guide was structured in the following manner:

- **Introduction.** Basic information on the interviewees' roles and responsibilities.
- **Decision-making.** Identification of decision-makers, decision factors, and equipment selection policies.
- **Corporate Support.** Information on real estate decision-making and policies.
- **Corporate Policies.** Information on energy efficiency guidelines.
- **Program Participation.** Reasons for and barriers to participation and the level of program influence.
- **Firmographics.** Size of facilities, number of employees, etc.

Due to the relatively small sample size, the interviews are not intended to be a statistical representation of the population of C&Fs. Instead the interview results should be considered as a qualitative representation of the attitudes, behaviors, and practices of C&F customers.

7.1.2 Sample Approach

The LCIEC team set out to complete 25 telephone interviews with key C&F customers located in Massachusetts. To this end, the LCIEC team made over 250 calls to individuals at key C&F companies. However, difficulty in reaching the appropriate decision makers at these key

companies, combined with the constraints of the project schedule, made the completion of 25 interviews infeasible. We were able to complete 21 interviews with C&F managers.

The companies were identified through information collected as part of the C&F Customer Quantitative Profile (see Section 5). The stratified sampling plan presented here was developed based on key market segments identified in the quantitative profile. Due to the relatively small sample proposed for the interviews, the sample was not intended to be a statistical representation of the population of C&Fs; therefore, random sampling was not used. Instead, we systematically selected a sample of the C&F companies that had the largest number of locations per company headquarters within strata defined below. The primary source for companies in the sample was the Dun and Bradstreet database (D&B). We supplemented this information with contacts provided by PA National Account managers as well as other available data, including Dodge data and Internet research.

Table 7-1 presents the sampling approach based on the quantitative profile (Section 5). In order to determine the target number of completes for each strata, we allocated completes to each strata roughly proportional to the distribution of locations. We then split the targeted number of completes for each strata equally between company owned and franchisee owned firms. If a market sector had an odd number of target completes, we then allocated the extra complete to the ownership type with more locations. In order to obtain at least one complete per available stratum, we reallocated one target complete away from eating and drinking establishments, the largest market segment, to financial services.

As mentioned previously, the team completed 21 of the targeted 25 interviews. In order to complete as many interviews as possible, towards the end of interviewing the constraints imposed by the original sample frame were relaxed to allow for additional completes in strata that were already filled. At least one interview was completed in each industry, with the exception of automobile dealers.

The final sample included six interviews with franchisees and 15 with chains. The team encountered greater obstacles completing interviews with franchisees due to an inability to reach decision-makers. When contacting local franchise locations and headquarters, owners were most frequently identified as the person most knowledgeable about decision making processes, corporate policies, and participation in energy efficiency programs. However, it was extremely difficult to obtain contact information for these owners as they frequently did not work at franchise locations. In most cases local staff were either unaware of how to contact owners directly or asked that the LCIEC team leave messages for owners.

Table 7-1: Chain and Franchise Sample Frame

Market Sector	Industry	Ownership	Target Completes	Actual Completes
Retail	Eating and drinking	Company	4	3
		Franchisee	4	2
	Auto dealers	Company	1	--
		Franchisee	1	--
	Food stores	Company	3	5
		Franchisee	3	1
Big box	Company	2	3	
Service	Healthcare	Franchisee	1	1
	Other services	Company	2	3
		Franchisee	2	2
Financial service		Company	1	--
		Franchisee	1	1
Total			25	21

All respondents identified themselves as knowledgeable about their company’s decision making processes, corporate policies, and participation in energy efficiency programs offered in Massachusetts.

7.1.3 Analysis

Most sections begin with a brief discussion of overall C&F results. In order to make clear any differences between chains and franchises, we then present the results separately for chain respondents and franchise respondents. Due to the relatively small sample size and the qualitative nature of the research, all data are presented unweighted.

7.2 Summary of Key Findings

In this section we present a summary of the key findings of the C&F customer interviews.

7.2.1 Customer Characteristics

- Customers in the C&F sector vary widely in size, from franchisees with a single location to chains with hundreds of locations throughout Massachusetts. On average, chain customers have significantly more locations than franchisees. The energy needs and

decision-making processes for customers with a handful of locations differ from those with locations number in the hundreds.

- Chain customers are more likely than franchisees to oversee a more geographically diverse set of locations, both inside and outside Massachusetts. Among chains, key decision-makers were most frequently responsible for overseeing all locations in Massachusetts, as well as all other locations throughout the US. The larger areas of responsibilities may have an impact on the consistency of decision making since decision makers are responsible for a greater number of locations.
- C&F customers tend to lease more space than they own. However, chain customers are more likely to own space than franchisees.

7.2.2 Decision-Making

C&F customers expressed little difference in decision-making processes between types of equipment, but reported that there were significant differences in decision-making processes between equipment replacement and new construction projects.

7.2.2.1 Equipment Replacement

- C&F customers rely on corporate management, high ranking officers, or specialized departments to make the final decisions regarding equipment replacement. Among chains, it is much more likely that someone outside of corporate management is responsible for making the final decision to replace equipment. In contrast, management or owners are most frequently responsible for these decisions among franchisees.
- The majority of C&F customers identified a financial factor as the most important consideration when replacing equipment. However, while franchisees seemed most concerned with initial costs, chains seemed to be more aware of the total cost of ownership and focused instead of total life cycles and two of its main components—operating costs and maintenance costs.

7.2.2.2 New Construction

- Unlike equipment replacement, C&F customers look not only to internal staff but involve external consultants and vendors to help them make decisions regarding new construction projects. In addition, some C&F customers move final decision making to a

committee composed of various stakeholders in their organizations to ensure that the best decisions are being made when it comes to new construction ventures.

- Some C&F customers have set layouts and floor plans that they look to when they build new stores and factor this into site selection. In addition, C&Fs with a presence outside of Massachusetts use national contracts with manufacturers and suppliers to bring down costs on equipment installed in most of their locations. In order to successfully influence the energy usage of these chain stores, the programs would need to convince these customers to make changes to all of their locations and not just those located in Massachusetts. This situation emphasizes the importance of early program involvement as designs that are not included in the base plans are less likely to be implemented for the collection of a single rebate.
- C&F customers often work with long time tables and are constrained by schedules and budgeting cycles. Given the scope of costs for new construction projects it may be important for the programs to reach these projects early in the project cycle and help secure financing or outside funding sources for larger projects.
- Some chains reported that when they make changes in standard designs or increase efficiency they roll out changes first to locations where savings will be the highest. While these chains indicated that for the most part the energy efficient upgrades they roll out will eventually reach all of their locations, the fact that they target areas with incentives and high rates suggests that Massachusetts may be among the pilot regions. It appears that programs may ensure that measures are implemented early in Massachusetts.

7.2.2.3 Consistency of Decision-making

- Half of the franchisees interviewed and the majority of chains interviewed said their decision-making processes were consistent nation-wide.
- Larger C&F customers with decision makers who are responsible for larger geographic areas are more likely to have consistent decision-making processes in place.
- Geography and regional climates play a role in shaping the decisions of some C&F customers.
- C&F customers with a national presence and consistent decision making processes leverage their buying power to get volume discounts on commonly used equipment for

all of their locations. As such, few chains said they negotiate directly with local Massachusetts vendors.

- Among chains, both utility rebates and other incentives are brought into consideration when making decisions regarding energy using equipment and new construction projects.

7.2.2.4 Barriers to Increasing Efficiency

- C&F customers reported that financial barriers are the primary impediment to increasing their level of energy efficiency. In addition to financial barriers, C&Fs also identified a lack of time, operational constraints, lack of knowledge about new products, and fears that new efficient equipment might not be as reliable.

7.2.3 Corporate Support and Policies

- Among C&F customers interviewed, real estate departments are primarily responsible for identifying or suggesting spaces for new locations, while management or committees make the final decision on any new spaces. However, a variety of departments and personnel are involved in the decision-making process including: internal construction groups, finance, purchasing, energy managers, and retail development departments.
- Half of the franchisees and a little more than half of the chains said that corporate provided support to local stores in identifying and negotiating for new spaces. When asked to identify the type of support provided, franchisees reported receiving corporate support for market research and customer counts, obtaining licenses, and specifying some equipment. In contrast, all of the chain who received support said that corporate takes care of all details pertaining to locating space.
- The majority of chains reported that there were standard types of equipment or services that their organizations seek in negotiating purchases or leases. In contrast, only one out of six franchisees reported that there were standard types of equipment or services sought in negotiating purchases or leases.
- The most frequently reported equipment that chain respondents specified in their leases were energy management systems and HVAC equipment. In addition, two chains and one franchisee specified that the ability to gut or build from the ground up was sought in negotiating purchases or leases.

- The vast majority of C&F customers pay for their utilities directly or as a pass-through as part of their lease.
- The majority of chains though relatively few franchisees reported that corporate provides support for on-going energy management. The most frequently mentioned type of support was energy bill analysis, specified by two franchisees and four chains. Other support mentioned includes: EMS/controls, energy use monitoring, benchmarking performance, decision support, and energy purchasing.
- About half of the C&F customers interviewed reported that their organization had energy efficiency guidelines in place. Respondents reported that the guidelines are generally followed within their organizations; however only five of 21 respondents reported that the guidelines were formalized into a written document.

7.2.4 Program Participation & Influence

- Nearly all of the chains, though only two of the six franchisees were familiar with and participated in the energy efficiency programs offered in Massachusetts.
- The majority of C&F customers mentioned a financial motivation when asked to provide reasons for participating in the programs. When probed to look beyond the obvious financial benefits, they mentioned a variety of benefits to participation including: guidance or advice from utilities, energy savings, corporate image, energy audits, and aesthetic improvements.
- C&F customers who participated in the energy efficiency programs in Massachusetts reported high levels of satisfaction with the programs. When asked to explain why they were satisfied with the programs, interviewees gave a variety of responses including: partnerships formed with utilities, scope and value of incentives, ease of participation, assistance provided, quick turnaround, quality of vendors, technical staff, research and information provided, and willingness to push the envelope.
- According to one chain, on-bill financing may allow C&F customers to pursue additional projects by transforming what would normally be capital expenses into operating expenses.
- The majority of C&F customers familiar with the programs offered in Massachusetts were aware that the programs now offer a consistent statewide design. However, less

than half said that the consolidation affected their participation. Among those affected, the consensus was that the consolidation had a positive impact on their participation.

- Six chains reported obstacles to participating in the programs to a greater degree. Among these chains, financial obstacles were most frequently cited including: capital costs, budgetary concerns, low incentives, and lack of additional capital.
- C&F customers provided moderately high ratings regarding the level of program influence on their decisions to install energy efficient equipment in Massachusetts. On a scale of zero to ten, where zero meant “not influential at all” and ten meant “very influential”, C&F customers rated the programs an average of about seven, regardless of equipment type. This indicates that the energy efficiency programs are an important source of influence for C&F customers.
- Many chain respondents focused on the impact of program incentives on the financial hurdles imposed by companies. However, even among chain respondents that said the programs were very influential, it was clear that the programs were not the single driving force behind projects. Instead, according to interviewees, programs help them to reach beyond their planned actions and incorporate additional energy efficiency features into their existing plans.

7.3 Respondent Responsibilities

The 21 decision makers who participated in the telephone interviews were typically in charge of purchasing decisions, engineering departments, or facilities departments. Their job titles varied widely but their responsibilities included facilities maintenance, construction, energy procurement, energy efficiency projects, and budgeting.

In general, the chain respondents were responsible for more geographic regions than the franchisee respondents. All 15 of the chain respondents were responsible for all regions in Massachusetts. Moreover, 13 of the 15 of the chain respondents were responsible for the entire United States. Four of the six franchisee respondents were responsible for a single location in Massachusetts, while the remaining two franchisee respondents were responsible for the entire United States (including all regions in Massachusetts). Table 7-2 displays the geographic areas within and outside of Massachusetts for which the C&F respondents reported being responsible.

Table 7-2: Geographic Area of Responsibility

Areas	Franchises	Chains	Combined
Areas inside MA			
Single location	4	--	4
All regions in MA	2	15	17
Areas outside of MA			
All US	2	13	15
All locations in New England	--	1	1
No locations outside MA	4	1	5
Number of respondents	6	15	21

7.3.1 Position Tenure

Table 7-3 displays the length of time respondents have held their positions. Seventeen of the 21 respondents supplied this information. The range of tenure reported by respondents was two to 30 years. On average, franchisee respondents have held their positions for 10.6 years, while chain respondents have held their positions for 6.7 years.

Table 7-3: Tenure of Respondent

Tenure	Franchises	Chains	Combined
Two to three years	1	4	5
Four to Six years	1	3	4
Seven to Nine years	2	2	4
Ten or more	1	3	4
<i>Average</i>	10.6	6.7	7.8
<i>Median</i>	7.0	5.5	6.0
Number of respondents	5	12	17

7.4 Decision-Making

In this section we discuss the decision-making processes of C&F customers.

By and large the C&F customers interviewed had a similar decision-making process for all types of equipment replacements. When asked to identify decision makers, contributors and other stakeholders for decisions to replace equipment, lighting, HVAC, motors, and controls, respondents offered nearly identical responses in each category. In contrast, while responses

only varied slightly between different equipment types, responses showed substantial differences between equipment replacement and new construction projects. This is likely due in part to the differences in cost and scope between the two types of projects. As such, consolidated results are presented for equipment replacement and for new construction projects.

Out of the 21 respondents, 14 said they were responsible for suggesting ideas or identifying opportunities for replacing equipment and ten said they made the final decision on equipment replacement. This is a strong indication that interviews were completed with the correct respondents. In contrast, only ten respondents said they directly contributed suggestions or identified opportunities to save energy in new construction projects and fewer (five respondents) said they were responsible for making the final decisions regarding new construction projects.

7.4.1 Decision-Making in Regard to Equipment Replacement

As Table 7-4 shows, the majority of C&F customers rely on corporate management, high ranking officers, or specialized departments to make the final decisions regarding equipment replacement. However, among chains it is much more likely that someone other than corporate management (or owners) will be responsible for making the final decision to replace equipment. This is not surprising given the difference in the number of locations for chains vs. franchisees. The LCIEC team hypothesizes that corporate management at chains needs to empower others to make decisions regarding equipment replacement, so that management can more closely focus their efforts on larger corporate goals and objectives. Perhaps reflecting this, the chains receive input or suggestions from a wider variety of sources as detailed in Table 7-4.

**Table 7-4: Parties Responsible-
for Making Final Decisions and Identifying Opportunities for Replacing Equipment**

Decision maker	Equipment Replacement – Primary Decision Maker			Equipment Replacement – Responsible for Identifying Opportunities (multiple responses)		
	Franchises	Chains	Combined	Franchises	Chains	Combined
Corporate management	4	4	8	4	4	8
Corporate energy manager	1	5	6	3	7	10
Finance department	1	1	2	1	1	2
Internal construction group	--	2	2	--	2	2
Engineering department	--	1	1	--	3	3
Purchasing department	--	1	1	--	3	3
Corporate committee	--	1	1	--	1	1
Consultant/vendor	--	--	--	3	2	5
Local store facility staff	--	--	--	--	4	4
Maintenance department	--	--	--	--	1	1
Number of respondents	6	15	21	6	15	21

The majority of both chains and franchisees identified some type of financial factor as the most important consideration when replacing equipment. However, perhaps demonstrating a higher level of sophistication compared with franchisees, relatively few chains referred to initial costs as an important factor and focused instead of total life cycle costs, payback period, operating costs, maintenance costs, or the availability of rebates. (Table 7-5)

Table 7-5: Factors Considered When Replacing Equipment

Factors	Equipment Replacement – Most Important Factor			Equipment Replacement – All Factors (multiple responses)		
	Franchises	Chains	Combined	Franchises	Chains	Combined
Total life cycle costs	1	5	6	--	1	1
Initial cost	3	1	4	--	4	4
Payback period or ROI	--	2	2	2	3	5
Efficiency of equipment	1	1	2	--	1	1
Operating costs	--	1	1	1	4	5
Maintenance costs	--	1	1	1	4	5
Availability of capital funds	1	--	1	--	--	--
Availability of rebates	--	1	1	--	3	3
Product presentation	--	1	1	--	1	1
Condition of existing equipment	--	1	1	--	3	3
Production capacity	--	1	1	--	--	--
Availability of tax incentives	--	--	--	--	1	1
Utility rates specific to region	--	--	--	--	1	1
Equipment warranties	--	--	--	1	--	1
Longevity of equipment	--	--	--	2	2	4
Quality of new equipment	--	--	--	--	1	1
Age of existing equipment	--	--	--	1	1	2
Depreciated value of existing equipment	--	--	--	--	--	1
Meets code requirements	--	--	--	--	--	1
Sustainable, “green”, or helps environment	--	--	--	--	--	2
Compatibility with EMS	--	--	--	1	--	1
Number of respondents	6	15	21	6	15	21

7.4.1.1 Franchisee Perspectives

Four of the six franchisees interviewed indicated that either the owner or corporate management made the final decision regarding equipment replacement. One franchisee said that a central energy manager was responsible for making final decisions and one said their corporate finance department made the final decisions.

When asked who contributed suggestions for or identified opportunities to replace equipment, corporate management again was the most frequently mentioned source, followed closely by a

corporate energy manager (3) and a consultant or vendor (3). According to the franchisees interviewed, local store staff does not play a role in specifying or identifying opportunities for equipment replacement.

Franchisees were also asked to identify what factors they consider when deciding to replace equipment. Four of the six franchisees identified a financial measure as the most important factor they consider—three said initial cost and one said total life cycle costs. While franchisees are concerned with initial costs they also demonstrated an understanding of the total cost of ownership and were not completely focused on the lowest initial cost. One respondent summarized their financial criteria as follows: “[We] select the unit that provides a low upfront cost and offers low maintenance and operational costs.” Demonstrating further understanding that initial cost is not always the best choice, another respondent said that they get quotes from a number of sources and then they choose the “best option - not necessarily the lowest price.” In addition to financial factors, one franchisee said that the efficiency of the equipment was the most important factor and one said they were constrained by their capital budget and that “cash outlays could not exceed the operating budget for that period.”

Franchisees also mentioned payback period (2), operating costs (1), maintenance costs (1), longevity of equipment (2), equipment warranties (1), and the age of existing equipment (1) as additional factors in their decisions to replace equipment. It is important to note that among franchisees, while not listed as the most important factor, the reliability of equipment was mentioned by a number of respondents because as one respondent said, “any time something fails, we may need to close until it is repaired. When we’re closed we’re not making money.”

7.4.1.2 Chain Perspectives

In contrast to franchises, the majority of chain respondents (10) said that someone other than corporate management or the owner was responsible for making the final decision regarding equipment replacement. Five respondents said that a corporate energy manager was responsible for the final decision, four said corporate management, two said they had an internal construction group who made the decisions, and three said a specific department makes those decisions—finance department (1), engineering department (1), or purchasing department (1). This is not surprising, given the relative size of chains vs. franchisees. By empowering others to make decisions regarding equipment replacement, management is likely able to more closely focus their efforts on larger corporate goals and objectives. Perhaps reflecting this, the chains receive input or suggestions from a wider variety of sources as detailed in Table 7-4.

As with franchisees, the majority of chains identified a financial factor as the most important consideration when replacing equipment. Eleven of the 15 chains interviewed identified either total life cycle costs (5), payback period (2), initial cost (1), operating costs (1), maintenance costs (1), or availability of rebates (1)—as the most important. Perhaps demonstrating a higher level of sophistication compared with franchisees, relatively few chains referred to initial costs as an important factor (1) or a secondary factor (4). Instead chains said they examined total life cycle costs, payback period, operating costs, maintenance costs, or the availability of rebates. Still, these financial factors can be a hurdle for projects, as one chain said, “measures are not implemented unless they meet [our] financial criteria. We have our own internal capital investment group that takes a look at it, does a full payback analysis and pro forma analysis.” While most chains were unwilling to share the exact financial criteria they use to screen projects, several chains indicated that their criteria had been changing over time, perhaps to reflect the higher cost of energy in recent years. As one respondent said, “all projects have to meet certain hurdle rates. In the past, projects with a two year payback or less were no brainers. Now, we’re looking more long-term and implementing some technologies with eight or nine year paybacks.”

When looking at total life cycle costs, some chains compare the current cost of operating existing equipment, including any future projections of maintenance expenses and any need to shut down operations while repairs or replacements are made. One chain noted that if equipment is “costing too much [to operate or repair] we’ll look at replacing them.” He went on to add however, that “if we see an opportunity to save money by implementing new technology with increasing operating savings we won’t hesitate to jump on it.”

Still other companies do not view existing equipment as sunk costs and are reluctant to replace equipment prior to the end of its useful life. As one respondent said, “[we] don’t replace equipment unless it breaks.” Another company indicated that their accounting practices could interfere with equipment replacements due to depreciation. He went on to explain:

If we are looking at equipment that still has a fairly good amount of money on the asset sheet we need to find a way to write it off or accelerate depreciation, or wait to replace it.

Another concern for chains is the impact of changes on the quality of their customers’ experiences. Due to this concern some of the larger chains reported that all new equipment, especially lighting, must be tested before it is implemented in a widespread fashion.

We're all into trying to work with LED lighting for energy efficiency but we haven't found the quality of the LED lights to be what we're looking for in terms of how it compares to incandescent lamp. We've gone through and have done some replacement lighting in some of our restaurants and it didn't do what we had hoped it would do from a quality standpoint.

Taking this a step further, two of the chains interviewed have in-house R&D departments that work closely with emerging technologies. Distribution of emerging technologies to stores throughout the US follows a similar pattern at both chains. When the R&D department feels a technology has promise they are installed at test, or pilot, stores. Once technologies are installed in test locations various groups examine the impact, including marketing and operations to make sure that technologies have the right "look and feel" as well as operational characteristics. If a technology proves itself at a test location only then will it be considered for full scale implementation. However, once a technology has proven itself, both chains said they move quickly to implementation so they can capture the full benefits of savings.

7.4.2 Decision-Making with Regard to New Construction Projects

Likely owing to the increased complexity and investment required for new construction projects, both chains and franchises look not only to internal staff but also involve external consultants and vendors to help them make decisions. In addition, some C&F customers move final decision making to a committee composed of various stakeholders in their organizations to ensure that the best decisions are being made when it comes to new construction ventures. C&F customers put considerable thought into site selection and the overall market characteristics of a location before they even consider building a store. Some C&Fs have set layouts and floor plans that they look to when they build new stores and factor this into site selection. In addition, C&Fs with a presence outside of Massachusetts use national contracts with manufacturers and suppliers to bring down costs on equipment installed in most of their locations. These factors make it increasingly important that the PAs get involved early on in the process. Changes that are not included in the base plans are less likely to be implemented for the collection of a single rebate. (Table 7-6 and Table 7-7)

**Table 7-6: Parties Responsible-
for Making Final Decisions and Identifying Opportunities for New Construction**

Decision maker	New Construction – Primary Decision Maker			New Construction – Responsible for Identifying Opportunities (multiple responses)		
	Franchises	Chains	Combined	Franchises	Chains	Combined
Corporate management	1	6	7	1	7	8
Corporate energy manager	1	3	4	2	5	7
Finance department	1	1	2	1	1	2
Corporate committee	--	2	2	--	2	2
Internal construction group	--	2	2	--	3	3
Corporate real estate department	--	1	1	1	3	4
Consultant/vendor	--	--	--	1	3	4
Engineering department	--	--	--	--	3	3
Purchasing department	--	--	--	--	2	2
Local store facility staff	--	--	--	--	2	2
Internal design team	--	--	--	--	1	1
Number of respondents	3	15	18	3	15	18

Table 7-7: Factors Considered For New Construction Projects

Factors	New Construction– Most Important Factor			New Construction– All Factors (multiple responses)		
	Franchises	Chains	Combined	Franchises	Chains	Combined
Total life cycle costs	1	5	6	--	1	1
Initial cost	--	2	2	--	3	3
Efficiency of equipment	1	1	2	--	--	--
Operating costs	--	1	1	--	3	3
Maintenance costs	--	1	1	1	2	3
Availability of capital funds	1	--	1	--	--	--
Meets code requirements	--	1	1	--	1	1
Product presentation	--	1	1	--	1	1
Payback period or ROI	--	--	--	1	3	4
Sustainable, “green”, or helps environment	--	--	--	--	3	3
Availability of rebates	--	--	--	--	2	2
Equipment warranties	--	--	--	--	1	1
Longevity of equipment	--	--	--	--	1	1
Quality of equipment	--	--	--	--	1	1
Availability of tax incentives	--	--	--	--	1	1
Compatibility with EMS	--	--	--	3	1	1
Number of respondents	3	12	15	3	12	15

7.4.2.1 Franchisee Perspectives

Of the six franchisees interviewed, only three respondents said they were actively engaged in new construction activities. The three franchises engaged in construction activities rely on three different sources to make final decisions regarding the energy aspects of new construction projects: corporate management, corporate energy manager, or finance department. In addition to these internal staff, franchisees said they rely on outside consultants to help identify and specify equipment for new construction projects. This is not surprising given the more complex nature and the increased level of capital outlay required by new construction projects. (Table 7-6)

When asked what factors they consider when making decisions about the energy using components of a new construction project, one franchisee said they are most concerned with the total life cycle costs, one said the efficiency of equipment, and one said the availability of

capital funds. Compatibility with existing EMS systems (3), maintenance costs (1), and payback period (1) were also mentioned by franchisees. In keeping with the perception of new construction project as a long-term investment, franchisees seem open to investing additional capital upfront to minimize operating costs over time. Given the nature of their facilities — smaller footprints with multiple locations — these franchises are most interested in prescriptive measures that help reduce life cycle costs.

7.4.2.2 Chain Perspectives

Unlike the franchisees, all of the chains interviewed are currently, or plan to be, involved in new construction projects. Eight out of 15 respondents indicated that either corporate management or a corporate committee were responsible for making the final decisions regarding new construction projects. This may be a direct result of the increased costs and higher levels of risk involved in new construction projects – it seems reasonable to the LCIEC team that management would want to more tightly control these types of expenses. Corporate energy managers still play a key role in making final decisions (3) and contributing to new construction projects (5). In addition, three chains said that they had an internal new construction group that was responsible for identifying opportunities or specifying equipment for new construction projects and two of these companies said that this same group makes the final decision. (Table 7-6)

Similar to equipment replacement, the majority of chains identified a financial factor as the most important consideration when purchasing equipment for new construction projects. Nine of the 12 chains involved in new construction identified either total life cycle costs (5), initial cost (2), operating costs (1), maintenance costs (1) as the most important factor. Just as they do with equipment replacement, chains said they examined total life cycle costs, operating costs, and maintenance costs. In order to keep costs down most chains have a prototype building or a set of plans that work in the majority of cases. In fact, the ability to build to their prototype specifications is a factor in site selection for some chains. As one chain stated,

We have a prototype building, basically. We design one building and it operates, we try to build that same building in MA as we do in AZ. So as we go in through and do local code checks, that would basically be the only thing that would change the specification from one state to another.

This approach could pose a barrier to increasing the efficiency of new construction among C&F customers. Further complicating matters is the time tables that C&F customers work with. As one chain said,

I'm budgeting right now for projects 3-4 years down the road--It's pretty much impossible to figure out any kind of scope of work for energy upgrades for new construction because we don't know what is going to come about.

The same respondent went on to say,

The initial capital cost for new construction is the most important factor. Especially for the higher end stuff like CHP. Say we are doing a fuel cell or CHP or solar--those measures aren't included in our initial new construction budget. We have to find a way to make those projects work by reducing other construction costs, or obtaining outside funding from incentives or tax breaks.

7.4.3 Consistency of Decision Making

7.4.3.1 Franchisee Perspectives

Regarding the consistency of decision making across regions or the nation, only three of six respondents said that decision-making processes were consistent nation-wide (or region-wide for regional organizations). Two said they were not sure if decision-making processes were consistent nationwide but they also indicated that they did not receive any input from a national source when making their decisions, which indicates they likely are not consistent. In addition, one franchise said that decision-making processes were not consistent nationwide.

Among the three franchisees with varying nation-wide decision-making processes, two respondents said that the geography and climate of regions plays a role in shaping their decisions. According to these respondents, they specify different levels of efficiency for HVAC equipment in areas with warmer and colder climates. In addition one large franchise said they use,

A third party company to chase rebates for us for everything we put capital behind that is a demand related opportunity. When we do a major

overhaul of say lighting, we have a specific schedule. If the rebates don't fit our schedule we won't change our schedule for rebates. We will beg and plead to someone to still give us their money since we did the work, but we won't change our schedule.

This indicates that while incentives offered locally may have little to no impact on the schedule for energy efficiency projects implemented by this franchisee, they still recognize the opportunity to collect the incentives. The use of a third party company who likely shares the funds collected with the franchisee further emphasizes the lack of influence of incentives on their schedule.

When asked whether they negotiated prices with Massachusetts vendors on frequently used types of equipment, four franchisees said no and two said yes. In general, those franchisees who did not negotiate prices with Massachusetts vendors worked with national manufacturers or vendors to secure bulk pricing. In fact, even when working with subcontractors one large franchise said,

We provide all of our equipment specifications for construction projects and assign that all to the general contractors. Either we purchase the equipment [for the project] or [we] provide the service provider with the ability to purchase our equipment with our price.

In contrast, the smaller franchisees indicated that they were basically on their own when it came to making energy decisions. For the most part these franchisees only make decisions when they have to, i.e., when equipment fails. When they are presented with opportunities to make changes they examine all their options equally and programs may have an opportunity to influence their decision. Furthermore, these franchisees are more likely to rely on local vendors and contractors who are likely familiar with the incentives available in Massachusetts.

7.4.3.2 Chain Perspectives

In contrast to franchises, the majority of chains (12 of 15) said their decision-making processes were consistent nation-wide. This is not surprising given the larger footprint of the chains, the larger number of stores they need to manage, and their corporate structure. This is also in keeping with earlier findings that some chains use a consistent prototype store when building new locations. This may indicate that to successfully influence the energy usage of these chain stores, the PAs would need to convince them to make changes to all of their locations and not just those located in Massachusetts. Alternatively, the incentives and savings would need to be

sufficient to convince the chains to implement changes only in Massachusetts and depart from their consistent store design.

The three chains that said their processes are not consistent nation-wide said that they are influenced by both utility rates and the availability of rebates or incentives. In fact, these three chains said when they make changes or increase efficiency they roll out changes first to locations where savings will be the highest. When asked to elaborate one respondent said, “rates come into factor, demand comes in, [as well as] rebates and incentives. [We] target places first where there are available rebates and higher electric prices.” Another respondent said “[we] factor in rebates and look at the overall net costs, including utility rates.” While all three chains indicated that for the most part the energy efficient upgrades they roll out will eventually reach all of their locations, the fact that they target areas with incentives and high rates suggests that Massachusetts may be among the pilot regions. It appears that programs may affect the timeline and ensure that measures are implemented first in Massachusetts. According to one large chain the timeline for rolling out measures can be significant meant that measures may be implemented years ahead of when they would be implemented otherwise.

Like the larger franchisees, most of the chains said that they leverage their buying power to get volume discounts for all of their locations. As such, few of the chains said they negotiate directly with local Massachusetts vendors. However, nine of the 15 chains said that local facility managers sometimes use local vendors or contractors for equipment or services on an as needed basis.

7.4.4 Barriers to Increasing Energy Efficiency

This section discusses the barriers reported by C&F customers that prevent the adoption of energy efficient equipment, practices, and facilities.

C&F customers primarily reported that financial barriers limited their ability to increase their level of energy efficiency. Ten respondents mentioned the need to overcome upfront costs, seven mentioned payback requirements, and one each mentioned lack of budget, lack of capital, lack of financing, and operating costs. Franchisees primarily reported financial barriers to pursuing energy efficiency. In addition to financial barriers, C&Fs also identified a lack of time, operational constraints, lack of knowledge about new products, and fears that new efficient equipment might not be as reliable. (Table 7-8)

**Table 7-8: Barriers to Increasing Efficiency-
(Multiple response)**

Barriers	Franchises	Chains	Combined
Upfront costs	2	8	10
Payback period or ROI	1	6	7
Lack of budget	2	1	3
Time	3	--	3
Current economic climate	--	2	2
Lack of capital	--	1	1
Lack of financing	--	1	1
Operating costs	--	1	1
Operational constraints	--	1	1
Lack of knowledge about new products	--	1	1
Reliability of new equipment	--	1	1
Not sure what to do	1	--	1
Doing everything we can	--	1	1
Number of respondents	6	15	21

7.4.4.1 Franchisee Perspectives

The six franchisees primarily reported financial barriers to pursuing energy efficiency. Two mentioned upfront costs, two mentioned lack of budget, and one mentioned the need for projects to meet payback requirements. These financial barriers do not eliminate energy efficiency but they may limit it. For example, one large franchise said that they consider all options for HVAC equipment, including high efficiency options and low efficiency. Once they have identified the options they create a business case that explores each of the options. Ultimately they may decide to go with something in the middle if that proves to be the best decision from a business perspective.

In addition to financial barriers, three franchisees reported a lack of time, and a lack of knowledge of what to do. Regarding a lack of time, one franchise said that if they receive all of their requested funds in the budget, “we still have to execute spending all of that money.” This can be a problem with franchisees that have smaller staffs dedicated to energy issues.

Another franchise said,

It would be nice if everyone had the same forms and expectations. If I fill out a 30 page form to change out a high discharge light and I'll never get a discount because of this huge form that is a huge barrier. Other IOU's such as SCE have a two page form where we get the money with no problem.

Perhaps highlighting the need for program marketing and education, one small franchise with a single location said, “we have a pretty small office, we don’t give a whole lot of thought to energy efficiency.”

7.4.4.2 Chain Perspectives

Every chain respondent mentioned at least one financial barrier that limited their ability to increase their level of energy efficiency. Eight of fifteen chain respondents mentioned the need to overcome upfront costs, six mentioned payback requirements, and one each mentioned lack of budget, lack of capital, lack of financing, and operating costs. One chain commented that they’d like to do more but, “[we] put together our wish list and ask for all of it in the budget and sometimes we get less.” He went on to add that energy efficiency projects compete head to head with operational projects when it comes time for the capital budget and that when capital is constrained operational projects have to come first. One chain summarized the problem aptly, “we’ve got to prioritize what we do. We would like to do much more but we have to think about our core business first.”

Perhaps contributing to the financial barriers is the poor economy; one chain mentioned that “the economic climate has forced [us] to tighten our belts because sales are down.” Another chain respondent elaborated on this point saying that the current economic climate has forced them to be even more conscious of their core business. This chain respondent said that even if they add projects to the budget,

[Projects] may not get approved based on the economy we're in. [We are]not an energy company. We are a retailer first, we are not going to get the amount of capital dollars that we would like to have for energy efficiency related projects; [these energy efficiency] projects also compete with other projects - we're fighting for the same money that everyone else is within the company.

In contrast, one chain respondent reported that they view energy efficiency as a tool to help them during the slow economy , “the reduction in consumption and increased savings goes a long way in helping the bottom line, especially with marginal [locations].” In addition one chain respondent said,

There are several areas where I go outside of our budgets and this creates bigger problems because not all utility companies across the country have utility programs. We're very fortunate in the New England area for energy efficiency rebates.

In addition to financial barriers, chains also identified a lack of time, operational constraints, lack of knowledge about new products, and fears that new efficient equipment might not be as reliable. (Table 7-8)

Discussing the selection of new equipment one chain said,

It can be tough deciphering some of the new technologies because so many people are coming out of the woodwork. Sifting through that slows down projects sometimes. We work closely with utility companies because they often send products off to a UL lab or testing before they rebate or incent some products. We also work with manufacturer sales reps because they do research as well.

Similarly, one chain respondent reported having problems in the past with some high efficiency equipment “[not] being able to do the job that you need it to do in the long run.” Other chain respondents reported issues with maintenance costs on high efficiency equipment and mentioned that sometimes high efficiency equipment can cost nearly twice as much to repair. These comments highlight chains’ need for a reliable source of information on new equipment so they can avoid negatively impacting their operations. As one chain said,

We are a supermarket company; we are not an energy company. Something we do could have a positive impact on energy savings, but could impact the day to day operations of the store negatively.

7.5 Corporate Support and Policies

When asked to identify the parties responsible for identifying spaces to purchase or lease for new locations and who makes the final decisions, C&F customers most frequently mentioned that a real estate department made the initial suggestions (10 out of 21) and that management or a committee (14 out of 21) made the final decision. In addition to real estate departments, respondents mentioned that management, internal construction groups, finance, purchasing, energy managers, and retail development departments contributed to space selection decision making. It is important to note that only five of the respondents said they were directly involved in decisions regarding identification and selection of new spaces for their companies. Due to their lack of involvement in these areas, respondents were asked to provide responses to the best of their abilities. As such, data collected regarding the identification and selection of new spaces may be less reliable. (Table 7-9)

**Table 7-9: Decision Makers –
Responsible for Identifying Space for Purchase or Lease**

Decision maker	Primary Decision Maker			Initial Suggestion (multiple response)		
	Franchises	Chains	Combined	Franchises	Chains	Combined
Corporate management	3	8	11	3	1	4
Corporate real estate department	--	4	4	2	8	10
Corporate committee	1	2	3	--	--	--
Finance department	1	--	1	--	2	2
Internal construction group	--	1	1	--	4	4
Purchasing department	--	--	--	--	2	2
Corporate energy manager	--	--	--	--	1	1
Retail development	--	--	--	--	1	1
Don't know	1	--	1	1	--	1
Number of respondents	6	15	21	6	15	21

Respondents were asked if corporate provided support to the local stores in identifying and negotiating for space. Table 7-10 displays the responses to this question. One half of the franchisees stated that corporate provided support to the local stores for space, while the other half said that it did not. Nine of the chain respondents confirmed that corporate provided support in identifying and negotiating for space, two stated that it did not, and four chain respondents did not know whether corporate provided support to local stores.

When asked to identify the type of support provided, franchisees reported receiving corporate support for market research and customer counts, obtaining licenses, and specifying some equipment. All nine of the chain respondents indicated that corporate takes care of everything pertaining to locating space. Additionally, two chain respondents specified that corporate real estate departments were responsible for identifying space, and one chain respondent indicated that corporate only provided support for market research and customer counts. (Table 7-11)

**Table 7-10: Corporate Support-
for Identifying and Leasing Space**

Support Provided	Franchises	Chains	Combined
Yes	3	9	12
No	3	2	5
Don't Know	--	4	4
Number of respondents	6	15	21

**Table 7-11: Type of Support Provided
for Space (Multiple Response)**

	Franchises	Chains	Combined
Takes care of everything	--	9	9
Market research / customer counts	1	1	2
Real estate expertise	--	2	2
Obtain licensing	1	--	1
Specifies some equipment	1	--	1
Number of respondents	3	9	12

The majority of chains (10 out of 15) reported that there were standard types of equipment or services that their organizations seek in negotiating purchases or leases. In contrast, only one out of six franchisees reported that there were standard types of equipment or services sought in negotiating purchases or leases.

Table 7-12 displays the types of equipment and services respondents reported that their organizations seek in negotiating purchases or leases. Eight of the 10 chains who reported that their organizations seek certain types of equipment and services were able to provide specific examples. The most frequently reported equipment that chain respondents specified are controls, energy management systems, and HVAC equipment. In addition, two chains and one franchisee specified that the ability to gut or build from the ground up was sought in negotiating purchases or leases.

**Table 7-12: What Types of Equipment or Services Specified-
(Multiple Response)**

	Franchises	Chains	Combined
Controls EMS	--	3	3
HVAC Equip	--	3	3
Gut or build from ground up	1	2	3
Specify tenant can apply for EE rebates	--	1	1
Refrigeration	--	1	1
Minimum utility service requirements	--	1	1
Specify availability of space for solar	--	1	1
Lighting requirements	--	1	1
Specify general efficiency of equipment	--	1	1
Number of respondents	1	8	9

7.5.1 Lease Terms

Respondents were asked if electricity and gas were typically included in their leases, and if there were standard lease terms that their organizations seek in negotiating leases. Virtually all respondents said that neither gas nor electricity are typically included in their leases, but instead

are paid by the C&F customers either directly or as a pass-through expense as part of their lease.³⁸

Three of the six franchisees stated that their organizations seek standard lease terms, while five of the 15 chains said that their organizations seek standard lease terms. Of the eight total respondents that said their organizations seek standard lease terms, seven respondents provided the length of years sought for leases (Table 7-13). Additionally, two chain respondents mentioned standard terms their organizations seek in addition to lease length: one specified adequate parking spaces and a specific amount of space, and the other specified complete control of any facility.

Table 7-13: Standard Lease Terms

Standard Terms	Franchises	Chains	Combined
Yes	3	5	8
Number of respondents	6	15	21
Number of years	Franchises	Chains	Combined
1 to 5	1	1	2
6 to 10	--	1	1
11 to 15	1	--	1
16 to 20	1	1	2
More than 20	--	1	1
<i>Average</i>	12.7	27.5	21.1
<i>Median</i>	15.0	15.0	15.0
Number of respondents	3	4	7

7.5.2 Corporate Energy Support

Nearly all chain respondents (14 out of 15) said that corporate staff provided support for on-going energy management. In contrast, relatively few franchisees (two out of six) stated that corporate provided support for on-going energy management. Twelve of the 14 chains and both of the franchisees who indicated that corporate provided energy management support furnished examples of the type of support provided. The most frequently mentioned type of support was energy bill analysis, specified by two franchisees and four chains. The next most frequently

³⁸ One chain respondent indicated that electricity and gas are sometimes included in leases. All other respondents stated that their organizations pay for gas and electricity directly.

mentioned types of support were EMS/controls, energy use monitoring, and benchmarking performance. In addition, two chain respondents indicated that corporate provided decision support regarding equipment and other energy-related issues. Lastly, one franchisee stated that corporate purchased electricity and gas for all stores where deregulation was available, and one chain said that support was provided in the form of fine tuning the use of equipment, including optimizing run times. (Table 7-14)

**Table 7-14: Corporate Support-
for Ongoing Energy Management**

Support Provided?	Franchises	Chains	Combined
Yes	2	14	16
Number of respondents	6	15	16
Type of support (multiple response)	Franchises	Chains	Combined
Energy bill analysis	2	4	6
EMS/Controls	--	5	5
Energy use monitoring	--	4	4
Benchmarking performance	--	3	3
Decision support	--	2	2
Energy efficient equipment procurement	--	2	2
Energy Procurement	1	--	1
Equipment use support	--	1	1
Number of respondents	2	12	14

7.5.3 Energy Efficiency Guidelines

Table 7-15 displays the number of respondents that reported that their organization had energy efficiency guidelines in place for specific measures and whether the guidelines were formalized in a written document.

Around one-half (10 out of 21) of the respondents reported that their organization had a policy or set of instructions in place that provided guidance in selecting the efficiency level of HVAC equipment. Four of those 10 respondents said that the guidelines were formalized in a written document. Nine respondents reported that their organization had energy efficiency guidelines in place for lighting and motors, eight reported that their organization had guidelines in place for new construction and controls, and five respondents indicated that their organization had guidelines in place for other measures. Respondents reported that the guidelines are generally

followed within their organizations, although one respondent indicated that new construction energy efficiency guidelines would not be enforced if they prevented the project from meeting its ROI target.

Table 7-15: Corporate Energy Efficiency Guidelines

Guidelines	Franchises		Chains		Combined	
	In place	Formalized	In place	Formalized	In place	Formalized
HVAC	2	1	8	3	10	4
Lighting	2	2	7	3	9	5
Motors	2	1	7	3	9	4
New Construction	1	1	7	4	8	5
Controls	1	1	7	3	8	4
Other	2	1	3	1	5	2
Number of respondents	6		15		24	

When asked to elaborate on what their organizations' corporate energy efficiency guidelines specified, some respondents provided general responses, such as "the highest efficient equipment", "the most efficient units manufactured at the time", or "we try to buy the most efficient equipment available". Five respondents indicated that their lighting efficiency guidelines identified the fixtures, bulbs, schedules, and/or lighting level to be used. Two respondents provided specific details of their lighting energy efficiency guidelines, reporting that T-8 fixtures were stipulated. In addition, one respondent reported that the lighting guidelines specified 75-85 foot candles for 75,000 hours. For HVAC, two respondents indicated that they rely on their vendors to assist in identifying high efficiency equipment, two reported that their efficiency guidelines specified set points, and one reported that their standard was 20 SEER. Additionally, one respondent reported restricting HVAC equipment purchases to a specific brand that produced only high efficiency equipment in order to obtain rebates.

Two respondents provided details of their organizations' new construction guidelines. One respondent stated that their organizations' prototype design met local and state building codes, was LEED certifiable, and exceeded ASHRAE 90.1. The other respondent explained that newly constructed locations had prescriptive shell requirements and that the standard for HVAC equipment and lighting installed in new locations was 20 SEER and 75-85 foot candles, respectively.

Nine out of the 10 respondents who reported that their organization had corporate energy efficiency guidelines in place said that the guidelines and criteria were consistent nationwide. The one exception, a franchisee, explained that the guidelines specified different sizes and types of equipment for various geographic locations based on differences in climate.

7.6 Program Participation

This section discusses the experiences of C&F customers with the energy efficiency programs offered in Massachusetts.

7.6.1 Reasons for and Benefits of Participation

In general, chain respondents were more familiar with energy efficiency programs offered in Massachusetts (14 out of 15) compared with franchisees (2 out of 6). Combined, the majority of C&F respondents mentioned a financial motivation (15 out of 16) when asked to provide reasons for participating in the programs. When probed to look beyond the obvious financial benefits, C&Fs mentioned a variety of benefits to participation including: guidance or advice from utilities, energy savings, corporate image, energy audits, and aesthetic improvements. (Table 7-16 and Table 7-17)

**Table 7-16: Reasons for Participating in MA Programs-
(Multiple Response)**

Reasons	Franchises	Chains	Combined
Rebates / incentives	2	12	14
Energy savings	--	6	6
Information or advice of utilities	1	2	3
Reduce carbon footprint	--	2	2
On-bill financing	--	1	1
Opportunity to provide feedback to utilities	1	--	1
Number of respondents	2	14	16

**Table 7-17: Benefits of Participation-
(Multiple Response)**

Benefits	Franchises	Chains	Combined
Financial benefits	2	8	9
Guidance or advice from utilities	2	3	5
Energy savings	1	4	5
Corporate image	--	3	3
Energy audits	--	2	2
Aesthetic improvements	--	1	1
Number of respondents	2	14	16

7.6.1.1 Franchisee Perspectives

Only two of the six franchisees interviewed were familiar with the Massachusetts energy efficiency programs and both of these franchisees said they participated in the programs.³⁹ Both franchisees noted that in addition to the financial benefits of participation, participation gave them the opportunity to work more closely in partnership with the utilities. As one franchisee noted, “by participating in the programs we have the opportunity to provide input to the utilities and provide feedback on why we’re not getting incentives for certain items.” In addition, the other franchisee mentioned that they “receive guidance from the utility companies on additional ways to enhance projects.”

7.6.1.2 Chain Perspectives

In contrast to franchisees, nearly all of the chain respondents said they were familiar with the energy efficiency programs offered in Massachusetts (14 out of 15), and all of these chains reported participating in the programs. When asked why they participated in the programs the majority of chains mentioned the rebates or incentives (13 out of 14). Chains also mentioned energy savings (6), information or advice of utilities (2), and a desire to reduce their carbon footprints (2).

It is not surprising that the majority of chains mentioned rebates and incentives because as one chain put it, “rebate money makes projects feasible.” Another chain elaborated on this point:

³⁹ This represents familiarity with and not general awareness of the programs. All of the franchisees were aware that the programs existed.

These programs helped us meet our financial hurdles and got us approval from finance. The rebates were critical. Without the rebate monies the ROIs would be a little outside and finance would not proceed.

Speaking about on-bill financing, one respondent from a smaller chain said that the programs have enabled his company to pursue additional projects by allowing them to transform what would normally be a capital expenditure into an operating budget item. He went on to say:

The resulting savings either cover or nearly cover the costs of the projects in the short-term. In the long-term the reduction in consumption and increased savings has done a lot for the bottom line.

Another chain respondent explained that “keeping energy costs as low as possible is paramount to being a successful business today.”

Still, other chains downplayed the importance of the programs. As one large chain said,

We don't do projects because of the incentives themselves. We are going to build our store or put in our equipment anyway. We know the incentives are out there so we take advantage of them.

This sentiment was echoed by three other chains. One of these chains explained that higher energy rates made Massachusetts locations prime targets for projects and that the rebates and incentives just made the return on investment even better.

Regardless of their reasons for choosing to participate in the energy efficiency programs offered in Massachusetts, all of the chains who have participated in the programs recognize their benefits. Financial benefits were the most frequently mentioned (8 out of 14). Comments regarding financial benefits mirror the earlier comments regarding reasons for participation. When asked to think beyond financial benefits, chain respondents identified the following additional benefits of participation: energy savings (4), guidance or advice from utilities (3), corporate image (3), energy audits (2), and aesthetic improvements (1).

Energy Savings. Each of the four chains that mentioned energy savings commented that the savings would help improve their bottom lines, and that the Massachusetts programs had contributed to making some of those projects possible. One large chain characterized the amount of energy saved in the region as “astronomical” and another said savings had been “astounding.”

Guidance or Advice from Utilities. Three chains said that participation gave them the opportunity to receive guidance or advice from the utilities. One said that it was “good to have a resource to help model some initiatives.” Another said they received useful guidance regarding lighting and HVAC equipment. The last chain commented that forums hosted by the PAs provided “good information and networking opportunities.”

Corporate Image. Three chains also reported that they see participation as a way to help improve or strengthen their corporate images. As one chain respondent said, “one of our core values is environmental stewardship. Participating in these programs helps promote that value.” Another chain respondent said that “[we] get a lot of soft benefits that our customers understand. These projects help them to see that we are a green company.”

Energy Audits. Two chain respondents mentioned energy audits as a benefit to participating in the Massachusetts energy efficiency programs. One chain respondent commented that the energy audits were particularly helpful for planning purposes. He remarked,

[We] take advantage of audits whenever possible. During a recent project the utilities hired an engineering firm to walk through all of our facilities. As a result of that we identified over a million kWh of savings.

Another chain respondent added that energy audits help them quantify the full savings that can be achieved. According to this interviewee, the findings from audits “go a long way to convincing management to move forward with projects.”

Aesthetic Improvements. Finally, one chain respondent reported that they “received a lot of positive feedback from customers as to the aesthetics of the lamps we put in.”

7.6.2 Satisfaction with Programs

When asked to rate their satisfaction with the programs offered in Massachusetts on a scale of zero to ten, where zero meant “very dissatisfied” and ten meant “very satisfied”, C&F respondents who had participated in the programs provided high marks. The 15 C&F customers who had participated in a program gave them an average rating of an 8.1 out of 10. When asked to explain why they were so satisfied with the programs C&F customers gave a variety of responses including: partnerships formed with utilities, scope and value of incentives, ease of participation, assistance provided, quick turnaround, quality of vendors, technical staff, research and information provided, and willingness to push the envelope. (Table 7-18 and Table 7-19)

Table 7-18: Satisfaction with Programs in MA-0 to 10 Scale

	Franchises	Chains	Combined
Eight to Ten	2	10	12
Four to Seven	--	3	3
Zero to Three	--	--	--
Average	8.5	8.0	8.1
Median	8.5	8.0	8.0
Number of respondents	2	13	15

Table 7-19: Reasons for Satisfaction- (Multiple Response)

Reasons	Franchises	Chains	Combined
Partnership formed with utilities	1	4	5
Scope and value of incentives	1	3	4
Ease of participation	--	3	3
Assistance provided	--	3	3
Quick turnaround	--	1	1
Quality of vendors	--	1	1
Technical staff	--	1	1
Research / information provided	--	1	1
Willingness to push the envelope and try new things	--	1	1
Number of respondents	2	14	16

7.6.2.1 Franchisee Perspectives

When asked to rate their satisfaction with the programs offered in Massachusetts on a scale of zero to ten, where zero meant “very dissatisfied” and ten meant “very satisfied”, one franchise respondent rated the programs an eight citing the scope and range of the rebates as a reason for high satisfaction. The other franchise respondent rated the programs a nine and commented that the people they work with are the reason for high satisfaction. This interviewee described program staff as “go getters” and went on to say, “they want us to perform these projects. They really want to help us out.”

7.6.2.2 Chain Perspectives

When asked to rate their satisfaction with the programs offered in Massachusetts on a scale of zero to ten, where zero meant “very dissatisfied” and ten meant “very satisfied”, 10 chain respondents rated the programs an eight or higher, two rated the programs a seven, one rated the programs a five and one did not provide a response.

Only one chain said they were dissatisfied with the programs. When asked for their reasons for dissatisfaction this chain said:

The process is very hard and cumbersome to get through. It’s time consuming and requires a lot of follow up. The people we deal with are very helpful, very nice. It seems more like the system is not on track, not the people.

The other respondents were asked to explain why they were satisfied with the programs offered in Massachusetts. Chains identified the following reasons: partnerships with utilities (4), scope and value of incentives (3), ease of participation (3), assistance provided (3), quick turnaround (1), quality of vendors (1), technical staff (1), research and information provided (1), and willingness to push the envelope (1).

Partnerships formed with Utilities. Four chains mentioned that the utilities had formed partnerships with them and that these partnerships were a source of satisfaction and helped them to achieve their goals. These chains cited the cooperation and support provided by program staff and that the PAs seemed willing to work through any problems or pitfalls with them.

Scope and Value of Incentives. Four chains said that they were satisfied with the scope and value of the financial incentives provided by the programs. One chain observed that “Massachusetts offers one of the more lucrative incentives.” However, one chain who cited scope and value as a reason for satisfaction also said that the programs “are missing things like money for combined heat and power or incentives for fuel cells.”

Ease of Participation. Three chains commented that participation was easy and as one chain said, “the programs are really straightforward.”

Assistance Provided. Three chains said that the assistance provided by the PAs was a key source of satisfaction. One chain said that their account representative works with them to make

participation easy. According to this chain their account representative “does the legwork for us and helps us with allowances for multiple locations.”

Quick Turn Around. One chain expressed satisfaction with the quick turnaround provided on requests and inquiries.

Quality of Vendors. One chain said they were satisfied with the quality of vendors selected for the program. However, the same respondent went on to add that:

The thing that is a little disturbing, we're sort of locked into the people that they designate to do the work. I had some work done and three different companies were involved. Two out of three were outstanding. However, one of them was very difficult at getting things accomplished. So much so that I had to bring it up with National Grid, I wanted to change companies and it was sort of a locked in deal.

He went on to add that “when you have one company it takes away some of the competitiveness.”

Technical Staff. One chain respondent was particularly satisfied with the technical team. They said the “technical team was fantastic. We presented what we wanted to do and they sat down with us and came to an agreement.”

Research and Information Provided. One chain interviewee said that the research they were provided by the PAs was extremely useful and helped with moving projects forward.

Willingness to Push the Envelope. One chain respondent saw value in the willingness of the PAs to push the envelope and pursue new projects with customers. This chain went on to add that “because of the climate in Massachusetts—the rebates, the rates, and the attitudes of the utilities—we can bring test projects there before rolling them out elsewhere.”

7.6.3 Program Integration

7.6.3.1 Franchisee Perspectives

Both franchisees were aware that the energy efficiency programs in Massachusetts now offer a consistent statewide design that includes incentives for equipment that save both electricity and natural gas. However, since one of the franchisees only had one location in Massachusetts they

were not impacted by these changes. The other franchisee said that the consolidation “helped us integrate our most recent projects and allowed us to more easily obtain incentives.”

7.6.3.2 Chain Perspectives

Ten of the fourteen chain respondents were aware that the energy efficiency programs in Massachusetts now offer a consistent statewide design that includes incentives for equipment that save both electricity and natural gas. Five of these respondents said that the consolidation affected their participation in a positive way. One respondents comment perhaps best summarizes the effect of program integration on projects:

The consolidation has made things a lot easier and I'm thankful for that. [Before] every utility had a different program and that was horrible. This is great.

Another chain respondent added that:

We recently did a pilot project to install a new rooftop unit with a heat recovery wheel. This project had electric and gas savings. In the past it would have been difficult to get the two utilities to agree. With MassSave they both worked together to come up with a share of the rebate and it was fairly substantial.

Still, it is important to note, the other five chain respondents that were aware of the program integration do not believe it has affected their participation in any way.

In addition to comments regarding the consolidation of programs, one interviewee offered a comment on the evolution of program design. This chain respondent explained:

As programs have evolved, a lot of equipment are prescriptive vs. custom. Prescriptive allows us to streamline doing these projects faster because pre approvals are quicker.

7.6.4 Obstacles to Participation

7.6.4.1 Franchisee Perspectives

Only one of the 2 franchisees reported an obstacle to participating in the programs to a greater degree. This franchisee said, “[we] can’t participate for natural gas savings because the central plant that serves us is privately owned and does not pay the energy surcharge for projects.”

7.6.4.2 Chain Perspectives

Six of the 14 chain respondents reported obstacles to participating in the programs to a greater degree. Four of these interviewees said that a financial obstacle existed. Financial obstacles included capital costs, budgetary concerns, low incentives, and lack of additional capital to do more projects. One chain respondent mentioned that they are not in agreement with the PAs on the type of products specified for LED lighting. According to this respondent, their locations use a type of LED lighting that is not approved for installation by the PAs. In addition, one chain mentioned barriers faced due to current laws in Massachusetts regarding funding for renewable projects. This chain said that “sometimes the focus of the [PAs] is on other areas. There might need to have some laws changed to open up focus on other areas.”

7.6.5 Program Influence

In order to better understand the influence of the program offered in Massachusetts on decisions to install energy efficient equipment, the C&F customers who reported participating in the Massachusetts programs were asked to rate the influence of energy efficiency programs. using a scale of zero to ten, where zero meant “not influential at all” and ten meant “very influential”. In general C&F customers provided high ratings (greater than seven for most equipment categories). New construction received the lowest influence rating — an average of 6.8. (Table 7-20)

Lighting. Thirteen C&F respondents rated the influence of the programs on lighting an average of 7.3—six rated it between an eight and a ten and seven rated it between a four and a seven.

HVAC. Twelve C&F respondents rated the influence of the programs on HVAC equipment an average of 7.1—four rated it between an eight and a ten and eight rated it between a four and a seven.

Motors. Nine C&F respondents rated the influence of the programs on motors an average of 7.2—four rated it between an eight and a ten and five rated it between a four and a seven.

Controls. Twelve C&F respondents rated the influence of the programs on controls an average of 7.4—six rated it between an eight and a ten and six rated it between a four and a seven.

New Construction. Eight C&F respondents rated the influence of the programs on new construction an average of 6.8—three rated it between an eight and a ten and five rated it between a four and a seven.

**Table 7-20: Influence of MA Programs on Decisions-
0 to 10 Scale**

	Franchises	Chains	Combined
Lighting			
Eight to Ten	1	5	6
Four to Seven	1	6	7
Zero to Three	--	--	--
Average	6.5	7.5	7.3
Median	6.5	7.0	7.0
Number of respondents	2	11	13
HVAC			
Eight to Ten	1	3	4
Four to Seven	1	7	8
Zero to Three	--	--	--
Average	6.0	7.3	7.1
Median	6.0	7.0	7.0
Number of respondents	2	10	12
Motors			
Eight to Ten	--	4	4
Four to Seven	1	4	5
Zero to Three	--	--	--
Average	6.0	7.4	7.2
Median	6.0	7.5	7.0
Number of respondents	1	8	9
Controls			
Eight to Ten	--	6	6
Four to Seven	1	5	6
Zero to Three	--	--	--
Average	5.0	7.6	7.4
Median	5.0	8.0	7.5
Number of respondents	1	11	12
New Construction			
Eight to Ten	--	3	3
Four to Seven	1	4	5
Zero to Three	--	--	--
Average	6.0	6.9	6.8
Median	6.0	6.0	6.0
Number of respondents	1	7	8

7.6.5.1 Franchisee Perspectives

One franchisee rated the influence of the program an eight (out of ten) for lighting and HVAC equipment, a six for motors and new construction, and a five for controls. The other franchisee rated lighting a five and HVAC equipment a four. The same respondent said they did not have any experience with using the programs for motors, controls, or new construction.

Lighting. When asked to explain their ratings for lighting, one franchisee who rated the influence of the program as a five said that while the program helped make the project more profitable they would have pursued lighting upgrades on their own without the programs assistance.

The other franchisee who rated the influence of the program as an eight, said that they used the incentives to buy down the total cost of their lighting projects to get the payback within three years. Without the incentives they would not have been able to meet their financial hurdles.

HVAC. When asked to explain their ratings for HVAC, one franchisee who rated the influence of the program as a four said that the program was not key in their decision. He went on to explain that they would have needed to replace the unit anyway and would likely have installed something of a similar level of efficiency.

The other franchisee who rated the influence of the program as an eight said that they used the incentive money to expand their existing plans and retrofit additional HVAC equipment than would have been done in the absence of the program.

Motors. As with lighting, the franchisee who rated the influence of the programs on motors as a six said that they used the incentives to buy down the payback period for a VFD project. However, the buy down did not have as large of an impact of this project as with the lighting. He went on to add that the program helped them to upgrade from standard equipment to premium efficiency equipment. This may indicate that the program had a larger impact on this project, since it is likely that in the absence of the program standard efficiency equipment would have been installed.

Controls. The franchisee who rated controls as a five was unable to provide any rationale or explanation for their rating. They simply stated that the “utilities seem willing and wanting to help us.”

7.6.5.2 Chain Perspectives

In general chains gave high ratings (seven or greater on average) regarding program influence. However, three of the chain respondents declined to answer this set of questions. New construction received the lowest influence rating on average of 6.9.

Lighting. Eleven chains rated the influence of the programs on lighting an average of 7.5—five rated it between an eight and a ten and six rated it between a four and a seven.

HVAC. Ten chains rated the influence of the programs on HVAC equipment an average of 7.3—three rated it between an eight and a ten and seven rated it between a four and a seven.

Motors. Eight chains rated the influence of the programs on motors an average of 7.4—four rated it between an eight and a ten and four rated it between a four and a seven.

Controls. Eleven chains rated the influence of the programs on controls an average of 7.6—six rated it between an eight and a ten and five rated it between a four and a seven.

New Construction. Seven chains rated the influence of the programs on new construction an average of 6.9—three rated it between an eight and a ten and four rated it between a four and a seven.

Explanation of ratings

When asked to expand upon their influence ratings, the vast majority of respondents provided the same reasons for all categories or provided only one response that covered all categories. Because responses were consistent across categories the team decided to present the results as a whole instead of by category.

In keeping with the high ratings, the majority of comments were positive. As with earlier comments, many focused on the impact of incentives on the financial hurdles imposed by companies. However, even among chain respondents that said the programs were very influential, it was clear that the programs were not the single driving force behind projects. Instead, according to interviewees, programs help them to reach beyond their planned actions and incorporate additional energy efficiency features into their existing plans. This is perhaps best summarized by one chain respondent who said, “we don't make decisions based on programs. We make them based on marketing and sales decisions.” This same interviewee went on to add that while they will look at including high efficiency equipment, they do not make their decisions based on the availability of incentives.

Another chain respondent further described:

Having rebate programs helps make projects that much more financially feasible. There are some projects if rebate programs didn't exist, we wouldn't do them. Mainly on the LED side. It makes the payback that much better and allows us to do more projects in that group. If payback is three years and a program gets us down to one and a half then that makes us more likely to do that project.

One chain interviewee that rated the influence of the programs a ten in each category said the following:

They [the programs] had a high impact on the decisions because the decisions weigh upon ROI, and when considering ROI we have to consider what rebate monies are available. We're able to install measures in Massachusetts and not other regions because of the programs. We're investing more in Massachusetts facilities than other regions due to program incentives.

Another chain said that although they would have moved forward with some projects, they “wouldn't be able to get as far without the rebates.” The same chain went on to add that the “programs made it viable to do some of these upgrades.”

7.7 Customer Characteristics

In this section, we discuss the ownership status and size of the companies interviewed.

7.7.1 Corporate Ownership

While making phone calls to schedule interviews it became increasingly clear that the ownership status of C&F customers can be complex and may change over time. For example, four of the grocery stores listed as franchises in the D&B database were in fact corporate stores and not owned by franchisees. Further complicating matters, in one case a large food store reported that they recently went through a rather large corporate overhaul and that all of their locations were transitioning to franchises. This company had previously owned the majority of their locations throughout the US. This is further confused by the fact that a parent company may own a variety of franchises under the same name. In some cases, respondents identified

themselves as belonging to a corporate entity but it was later revealed that while they were part of a larger corporation they were operating franchises throughout Massachusetts and other parts of the country. Based on these areas of potential confusion, the LCIEC team confirmed the ownership status of each company during the interviews.

7.7.2 Primary Business Activity

The primary activities conducted by the C&Fs who participated in the telephone interviews include retail sales and service, warehouse and storage, office, restaurant or food service, grocery or food sales, medical services, and recreation. Table 7-21 displays the primary activities conducted by C&F customers represented by the 21 respondents.

**Table 7-21: Primary Activities in Massachusetts Locations-
(Multiple response)**

Activities	Franchises	Chains	Combined
Retail sales and service	2	8	10
Warehouse and storage	1	7	8
Office	2	5	7
Restaurant or food service	1	4	5
Grocery or food sales	1	4	5
Medical	1	--	1
Recreation	1	--	1
Number of respondents	6	15	21

7.7.3 Facility Ownership

The majority of respondents said that they leased more space than they owned. On average franchisees leased 76 percent of their space, while chain respondents leased 51 percent of their space. Combined, C&F respondents leased an average of 58 percent of the spaces they occupy and owned the remaining 42 percent of their space. Table 7-22 displays the percent of space leased reported by the 14 respondents who were able to supply this information.

Table 7-22: Ownership of Facilities in Massachusetts

% of Space Leased	Franchises	Chains	Combined
<25%	1	3	4
25 to 50%	--	2	2
50% to 75%	--	--	--
75% to 100%	3	5	8
<i>Average</i>	76%	51%	58%
<i>Median</i>	100%	58%	78%
Number of respondents	4	10	14

7.7.4 Number of Locations

The 21 respondents were responsible for overseeing as few as one location and as many as 210 locations in Massachusetts. In general, chain respondents were responsible for overseeing more locations than franchisee respondents. On average, franchisee respondents were responsible for overseeing 15 locations, and chain respondents were responsible for 71 locations. Five of the 21 respondents were responsible for overseeing more than 100 locations in Massachusetts. Table 7-23 displays the number of Massachusetts locations overseen by the respondents.

Table 7-23: Total Locations in Massachusetts

# of Locations	Franchises	Chains	Combined
1 to 10	5	1	6
11 to 20	--	4	4
21 to 30	--	2	2
30+	1	8	9
<i>Average</i>	15	71	55
<i>Median</i>	1	31	29
Number of respondents	6	15	21

7.7.5 Number of Employees

The respondents were asked to provide a best estimate of the number of full-time equivalent employees that work at their Massachusetts locations. All six franchisee respondents were able to answer this question, but only eight chain respondents provided a response. Table 7-24 displays the number of full-time equivalent employees that work at the Massachusetts locations

reported by respondents. The majority (4 out of 6) of the franchisee respondents reported that fewer than 100 employees work at the Massachusetts locations they oversee. Of the remaining two franchisee respondents, one reported between 500 and 1,000 employees, and the other reported over 1,000 employees. The majority (5 out of 8) of the chain respondents reported that over 1,000 employees work at their Massachusetts locations. The average number of full-time equivalent employees that work at the Massachusetts chain locations is 3,005.

Table 7-24: Full-time Equivalent Workers

# of Employees	Franchises	Chains	Combined
Less than 100	4	1	5
100 to 500	--	--	--
500 to 1,000	1	2	3
1,000+	1	5	6
<i>Average</i>	1,135	3,005	2,203
<i>Median</i>	9	1,725	815
Number of respondents	6	8	14

8. Conclusions and Suggestions for Phase 2 Research

In this section we provide a summary of the key findings of the C&F market characterization study, as well as conclusions and suggestions to consider for Phase Two of the research.

8.1 Key Findings

In this section we present key findings for the following topics:

- Market Size & Composition
- Decision-makers
- Decision-making
- Program Participation
- Program Influence

8.1.1 Market Size & Composition

Below are the key findings regarding the size and composition of the C&F market in Massachusetts.

- The LCIEC team conservatively estimates that there are a total of 4,739 C&F locations in Massachusetts employing nearly 130,000 people. Seventy-five percent of these locations are identified as franchise-owned and 25 percent are identified as corporate-owned. The average number of employees per location is similar between chains and franchises (Table 8-1).

**Table 8-1: Number of Locations & Employees-
by C&F Ownership in Massachusetts**

	Franchises	Chains	All
Number of Locations	3,542	1,197	4,739
Percent of Locations	75%	25%	100%
Avg. Number of Employees per Location	28	25	27

- Of the franchisee owned locations, 38 percent were designated as branch locations, and 62 percent were single (independent) sites. Nearly all of the corporate owned locations are identified as branches.
- Chain and franchise locations were highly concentrated in the retail trade industry, which accounts for 73 percent of all C&F locations (Table 8-2). Another 19 percent are in the services industry.
 - Within the retail industry, 34 percent of locations were eating and drinking establishments, 25 percent were food stores; and 20 percent were automotive dealerships.

**Table 8-2. Number of Locations and Employees-
by C&F Sector in Massachusetts**

Sector	Locations		Avg Number of Employees per Location
	Number	Percent	
Construction	14	0%	14
Manufacturing	54	1%	22
Transportation & Public Utilities	44	1%	30
Wholesale Trade	28	1%	17
Retail Trade	3,471	73%	28
Finance, Insurance, and Real Estate	250	5%	21
Services	878	19%	26

- The C&F customer with the most employees in Massachusetts is Stop & Shop, with over 11,000 employees. They are followed by Shaws, Dunkin Donuts, and McDonalds (Table 8-3). Given the high number of employees at grocery stores⁴⁰ and the high energy use intensity of the grocery sector, it is likely that both Stop & Shop and Shaws use more energy than other C&F customers.
- The C&F customer with the most locations is Dunkin Donuts – with about 440 stores, more than double the number managed by the next largest C&F customer – CVS (193).

⁴⁰ We consider the number of employees as a rough proxy for energy usage.

**Table 8-3: Number of Locations & Employees-
for Top Ten C&F Companies in Massachusetts**

Customer	Number of Locations	Average Number of Employees per Location	Total Number of Employees
Stop & Shop	76	146	11,096
Shaw's	65	114	7,410
Dunkin Donuts	440	14	6,160
McDonalds	145	42	6,090
Friendly's	103	36	3,708
CVS	193	19	3,667
Burger King	97	34	3,298
Big Y	21	156	3,276
Papa Gino's	108	23	2,484
Wendy's	68	31	2,108

- Overall, C&F customers represent about 20 percent of the program participants and electricity savings from the sample used in the re-analysis of NSTAR evaluation survey data. This sample may or may not be representative of all of Massachusetts.

8.1.1.1 Construction Activity

- An estimated 2,129 construction projects were performed over the past five years for C&F firms.
 - Stores and restaurants account for roughly 75 percent of construction projects undertaken by C&F firms and 67 percent of their square footage, but only 54 percent of the total value of work done.
 - Office and bank buildings represent the second largest number of projects (12 percent) but only five percent of the total value and square footage.
 - Hotels and motels account for only three percent of projects, but 14 percent of the square footage and 24 percent of the total value.

**Table 8-4: Construction Projects in Massachusetts-
over the Past Five Years**

Sector ⁴¹	Number of Projects	Percent of Projects	Percent of Square Footage	Percent of Value
Amusement, Social, and Recreation	74	3%	4%	4%
Hospitals and Other Health Treatment	124	6%	11%	13%
Hotels and Motels	70	3%	14%	24%
Office and Bank Buildings	257	12%	5%	5%
Stores and Restaurants	1,604	75%	67%	54%
Total	2,129	100%	100%	100%

- Over 65 percent of construction projects were alterations, renovations and interior completions, while 33 percent were classified as new construction. However, new construction projects represent 72 percent of square footage and 70 percent of value.
 - The average area and average value of each new construction project was roughly five times greater than each alteration project. Among the five sectors, hotels/motels have the highest average area and value for both new construction and alteration projects.

⁴¹ The Dodge construction data classified projects using different criteria than did the D&B data.

Table 8-5: New Construction and Alteration/Addition Projects in Massachusetts

Sector	New Construction			Alteration, Renovation or Addition		
	Number of Projects	Average s.f.	Average Value	Number of Projects	Average s.f.	Average Value
Amusement, Social, and Recreation	18	42	4,591	56	9	1,903
Hospitals and Other Health Treatment	21	126	19,662	100	13	1,875
Hotels and Motels	24	140	36,154	45	35	4,801
Office and Bank Buildings	99	8	1,125	154	5	697
Stores and Restaurants	507	35	3,264	1,069	6	705
Total	669	38	4,678	1,424	7	963

- Projects in the Boston area represent one-half of the C&F construction projects in Massachusetts over the past five years.
- Trends in construction activity over the past five years were reflective of the economic conditions, but the corresponding decline after the 2007 downturn was seen most prominently in the retail sector.

8.1.1.2 Customer Characteristics

- The C&F customers interviewed tend to lease more space than they own – an average of 58 percent and a median of 78 percent for the 14 respondents. However, chain customers appear somewhat more likely to own space than franchisees.
- Nearly all respondents reported that they pay for their electricity and gas usage directly or through pass-thru arrangements with building owners.

According to national account managers, C&F customers tend to be larger and more energy intensive than similar, non-C&F customers. In addition, several managers noted that the grocery sector tends to use more energy than other sectors due to its refrigeration needs.

8.1.2 Decision-Makers

Below are the key findings regarding the decision-makers at C&F customers.

- Interviewees from chains are more likely than franchisees to oversee a larger geographic area, either within or outside Massachusetts. The larger area of responsibility may affect the consistency of decision making, since decision makers are responsible for a greater number of locations.
- Customers' energy departments tend to be small (one to three individuals) with more business administrators than technical staff, according to the literature review. The exceptions to this are grocery chains, which tend to have larger and more sophisticated internal staff—probably related to their high energy intensity.
- C&F customers reported relying on corporate management, high ranking officers, or specialized energy departments to make the final decisions regarding equipment replacement. This appears to be consistent with the literature review, which found that energy departments are the most influential stakeholders in equipment purchase decisions, although it is usually the administrative department that has the final decision for retrofit projects.
 - Among chains it is much more likely that someone outside of corporate management (i.e., energy managers, internal construction groups, finance departments, engineering departments, and purchasing departments) is responsible for making the final decision to replace equipment. In contrast, management or owners are most frequently responsible for these decisions at franchisees.
- Unlike equipment replacement, C&F customers look not only to internal staff but also involve external consultants and vendors to help them make decisions regarding new construction projects.
 - Some C&F customers move final decision making to a committee composed of various stakeholders.
 - According to the national account managers, architecture firms play an advisory role in energy efficiency decisions within the retail sector, and marketing staff may be particularly influential in the grocery sector.

8.1.3 Decision-Making

Below are the key findings regarding the decision-making process for C&F customers.

- C&F interviewees expressed little difference in decision-making processes between types of equipment (lighting, HVAC, motors, and controls) but reported substantial differences in decision-making processes between equipment replacement and new construction projects.
- C&F customers reported that financial barriers are the primary impediment to increasing their level of energy efficiency. In addition to financial barriers, C&Fs also identified a lack of time, operational constraints, and a lack of knowledge and reliability concerns about new products.

8.1.3.1 Equipment Replacement

- According to the national account managers, all customers typically replace lighting systems during remodeling projects, though C&F customers are more likely to replace other systems such as HVAC and control systems, in addition to lighting.
- Not surprisingly, a majority of C&F interviewees identified costs as the most important consideration when replacing equipment. However, while franchisees seemed most concerned with initial costs, chains were more focused on total life cycle costs, operating costs, and maintenance costs.
 - While most chain interviewees were unwilling to share the exact financial criteria they use to screen projects, several chains indicated that their criteria had been changing over time, perhaps to reflect the higher cost of energy in recent years.
 - According to the national account managers, the required payback period depends, to a certain extent, on the magnitude of the upgrade, whether the facility is owned or leased, and the expected lifecycle of the new equipment.
- Another concern for chain interviewees is the impact of design changes on the quality of their customers' experiences. Some of the larger chains reported that all new equipment, especially lighting, must be tested before it is implemented in a widespread fashion. Echoing this concern, the literature review found that product presentation and sales are more important to national accounts than energy efficiency.

8.1.3.2 New Construction

- Some C&F customers use established layouts and floor plans when planning for new stores. In order to successfully influence the decisions of these chain stores, the programs may need to convince these customers to make changes to all of their locations and not just those located in Massachusetts. This situation emphasizes the importance of early program involvement, as designs that are not included in the base plans are unlikely to be changed for the collection of program incentives.
- Some chains reported that they first roll out design changes to locations where savings will be the largest. While these chains indicated that, for the most part, the energy efficient upgrades they roll out will eventually reach all of their locations, the fact that they target areas with program incentives and high energy costs suggests that Massachusetts may be among the pilot regions.
 - The literature review supports this finding, as national accounts were found to be more aggressive in implementing energy efficient retrofit projects in regions with good rebate programs.

8.1.3.3 Consistency of Decision-making

- One-half of the franchisees interviewed and the majority of chains interviewed said their decision-making processes were consistent nation-wide.
 - Larger C&F customers with decision makers who are responsible for larger geographic areas are more likely to have consistent decision-making processes in place.
 - Due to varying climates, geography plays a role in shaping the decisions of some C&F customers.
- C&F interviewees with a national presence and consistent decision making processes leverage their buying power to obtain volume discounts on commonly used equipment for all of their locations. As such, few chains said they negotiate directly with local Massachusetts vendors.
- Among chain interviewees, program incentives are considered when making decisions regarding energy using equipment and new construction projects.

- The literature review found that national accounts emphasized the importance of energy efficiency rebate programs in helping sell energy projects to upper management.

8.1.4 Energy Efficiency Policies

Below are the key findings regarding the energy efficiency policies of C&F customers.

- A majority of chain interviewees but only one out of six franchisees reported that there were standard types of equipment or services that their organizations seek in negotiating purchases or leases.
 - The most frequently reported equipment that chain respondents specified in their leases were controls, energy management systems, and HVAC equipment.
- A majority of chain interviewees but few franchisees reported that corporate provides support for on-going energy management.
 - The type of support most frequently mentioned by interviewees was energy bill analysis. Other support mentioned includes EMS/controls, energy use monitoring, benchmarking performance, decision support, and energy purchasing.
- About one-half of the C&F customers interviewed reported that their organization had energy efficiency guidelines in place.
 - Respondents reported that the guidelines are generally followed within their organizations; however only one-quarter of all interviewees reported that the guidelines were formalized in a written document.
 - Nearly all of the interviewees with corporate energy efficiency guidelines in place said that the guidelines and criteria were consistent nationwide.
- Some interviewees could only provide general descriptions of their energy efficiency guidelines, such as “we try to buy the most efficient equipment available”.
 - National account managers believe that, with the exception of the grocery sector, the energy efficiency guidelines are often general and it is not clear whether they provide guidance in selecting the efficiency level of equipment.

- Nearly 70 percent of C&F participants from the NSTAR survey re-analysis had an energy efficiency policy in place at the time of the survey and 63 percent had policies in place at the time of the program application, compared to only 42 and 33 percent for non-C&F participants, respectively. Both differences are statistically significant at the 95 percent level of confidence.
 - Only 36 percent of C&F participants reported having a written policy, compared with 66 percent of non-C&F participants. This difference is statistically significant at the 95 percent level of confidence.

8.1.5 Program Participation

Below are the key findings regarding the program participation of C&F customers.

- Nearly all of the chain interviewees but only two of the six franchisees were familiar with and participated in the energy efficiency programs offered in Massachusetts.
 - According to the national account managers, C&F customers are more likely than non-C&F customers to initiate contact regarding energy efficiency programs.
 - National account managers reported that C&F customers within the grocery, healthcare, and retail sectors may be more likely to participate than those in other sectors, while restaurants may be least likely to participate. Higher participation by the grocery and healthcare sectors is likely due to higher energy usage and increased likelihood of having fulltime energy managers on staff. In contrast, restaurant franchises may be constrained by how much they can deviate from construction specifications.
- The majority of C&F interviewees cited a financial motivation when asked to provide reasons for participating in the programs.
 - When probed to look beyond the obvious financial benefits, they mentioned a variety of benefits to participation including guidance from utilities, energy savings, corporate image, energy audits, and aesthetic improvements.
- C&F interviewees who participated in the energy efficiency programs in Massachusetts reported high levels of satisfaction with the programs.

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- Reasons for satisfaction include partnerships formed with utilities, the scope and value of incentives, ease of participation, assistance provided, quick turnaround, quality of vendors, technical staff, research and information provided, and willingness to push the envelope.
 - According to one chain interviewee, on-bill financing may allow C&F customers to pursue additional projects by transforming what would normally be capital expenses into operating expenses.
 - The majority of C&F customers familiar with the programs offered in Massachusetts were aware that the programs now offer a consistent statewide design.
 - However, less than one-half said that the consolidation improved their participation; the remainder did not mention any impact.
 - Six chain interviewees mentioned obstacles to participating in the programs, including financial obstacles such as lack of capital or budgetary concerns as well as low incentive levels.
 - According to national account managers, C&F customers choose not to participate in energy efficiency programs because the paperwork requirements are burdensome or because of a lack of program awareness. Additional reasons include limited capital and staff resources, ineligible projects, and insufficient heating costs to warrant investment.
 - The national account managers were generally in agreement that the reasons why C&F customers do not participate are the same for similar non-C&F customers, although the barriers may be steeper for the non-C&F customers.

C&F interviewees offered a variety of suggestions for increasing program participation by C&F customers, including incorporating more prescriptive measures, simplifying the application process, ensuring that C&Fs are familiar with eligibility requirements, increasing outreach to C&F decision makers, tailoring programs to individual C&F sectors, and offering on-bill financing.

8.1.6 Program Influence

Below are the key findings regarding the level of program influence on C&F customers.

- C&F interviewees provided high ratings regarding the level of program influence on their decisions to install energy efficient equipment in Massachusetts.
 - On a scale of zero to ten, where zero meant “not influential at all” and ten meant “very influential”, C&F customers rated the programs an average of about seven, regardless of equipment type or retrofit vs. new construction.
- Many chain interviewees focused on the impact of program incentives on overcoming the financial hurdles imposed by companies. While the programs are not the single driving force behind projects, the programs do help the customers incorporate additional energy efficiency features into their existing plans.
- Some national account managers believe that free-ridership is higher among C&F customers, while others indicated that there was no difference between C&F and non-C&F customers.
 - Two managers reported that free-ridership was higher among the retail sector than other C&F sectors, and one reported that free-ridership was higher among the grocery sector. Additionally, one manager suggested that free-ridership was higher among the larger C&Fs than the smaller ones due to the greater level of knowledge within larger organizations.
- The literature review found that free-ridership for new construction lighting purchases was significantly lower for chains and franchises than for other commercial customers in the 2005 National Grid programs, though spillover is roughly similar. In contrast, free-ridership for new construction HVAC was significantly higher for chains and franchises than for other commercial customers, though spillover is again similar (Table 8-6).

**Table 8-6: Free-ridership and Spillover Rates -
for Chains and Franchises 2005 Energy Initiative and Design 2000plus Programs⁴²**

	New Construction Lighting		New Construction HVAC	
	Chains & Franchises (n=16)	All Other Commercial (n=59)	Chains & Franchises (n=54)	All Other Commercial (n=117)
kWh Weighted Free-ridership	16%*	43%	79%*	38%
kWh Weighted Spillover	11%	5%	5%	4%

Statistically significant differences between “Chains & Franchises” and “All Other Commercial” are noted with an asterisk (*) at the 95% +/-5% confidence level.

- The re-analysis of NSTAR evaluation survey data provided inconclusive results regarding the level of program influence on participants.
 - The aggregated results for the years 2004 to 2007 did not reveal statistical differences between free-ridership rates for C&F participants and non-C&F participants, however:
 - In 2006, C&F participants had higher free-ridership rates than Non-C&F participants.
 - In 2004, the C&F free-ridership rate was lower than the Non-C&F group.
 - Free-ridership rates for Grocery, Health Care, Retail, and Other C&F participants were significantly different than the Non-C&F segment. However the direction of the differences varied. Grocery and Health Care C&F participant free-ridership rates were lower, while Retail and Other C&F free-ridership rates were higher.
 - Free-ridership levels did not vary by measure type. No statistical differences between C&F participants and non-C&F participants were found for lighting and non-lighting measures.

⁴² PA Consulting. *National Accounts Study: Customer Energy Efficiency Equipment Decision Making Process and Standard Practice-Final*. Prepared for National Grid, September 8, 2006.

8.2 Conclusions & Suggestions for Phase 2 Research

In this section we present conclusions and suggestions to consider for Phase Two of the research.

8.2.1 Conclusions

Underlying this market characterization study are concerns by program planners that C&F customers may be influenced by the programs to a lesser degree than non-C&F customers, due to their regional or national corporate structure. In order to address this concern, the LCIEC team integrated the Phase One findings to answer the following key research questions:

- Does the C&F market merit a market characterization study?
- Is the level of program influence less for C&F customers than non-C&F customers?

Based on the results of the Phase One research activities, the LCIEC team believes it can conclusively say that the C&F market in Massachusetts warrants an independent market characterization study. As to the question of program influence, study results do not conclusively support the notion that program influence is lower for C&F customers. Below we consider the evidence gathered in the market characterization study in order to answer these questions.

The C&F market in Massachusetts appears to be a large heterogeneous market that merits a market characterization study. The quantitative profile conservatively estimates that there are nearly 5,000 C&F locations in Massachusetts, with an annual average of about 400 construction projects over each of the past five years. In addition, C&F customers represented about 20 percent of participants and electricity savings in a sample of NSTAR's C&I programs between 2004 and 2007. Both of these findings indicate that the C&F market in Massachusetts is of sufficient size to warrant an independent analysis.

It is important to note that the C&F market is not homogenous, as there appear to be substantial differences between chains and franchises, which represent about 25 percent and 75 percent of the C&F market in Massachusetts, respectively. Chain interviewees were more likely to oversee a larger geographic area. They tended to rely on specialized departments within their companies to make decisions; operating and maintenance costs were often key factors in their decisions. At franchise locations, by contrast, it was the owner who was most frequently responsible for decision-making, and these owners tended to consider primarily initial costs in

their decisions. These inherent differences indicate that chains and franchises may require differing approaches. However, our interviewing revealed that the categorization of a business as a chain or franchise can be complex; many franchise businesses may also permit corporate ownership.

Even within the chain sub-market, there may be large differences in the level of energy sophistication. Due to their high energy use intensity, grocery stores and healthcare facilities may be more likely to have specialized energy managers on staff than retailers, for example. Additionally, it appears that some restaurant chains may be constrained by construction specifications and thus less likely to participate in programs.

The study results do not conclusively support the notion that program influence is different for C&F customers than non-C&F customers. C&F customers provided a wide range of responses in regard to the degree and nature of the influence of PA programs on renovation and construction activities that affect energy efficiency. This diversity of response mirrors to some extent the heterogeneity of the C&F customer segment. These results are discussed in further detail below.

- **The program incentives appear to help C&F customers overcome financial hurdles – such as payback period – in order to gain the approval of upper management.** Many chain interviewees emphasized the impact of program incentives on overcoming financial hurdles and helping customers incorporate additional energy efficiency features into their existing plans. In addition, the C&F interviewees provided relatively high ratings – about a seven on a ten-point scale – regarding the level of program influence on their decision to install energy efficient equipment at Massachusetts locations. These findings suggest that the program has a moderate effect on the decisions of C&F customers.
- **Some C&F customers may utilize the programs as an opportunity to pilot test new designs or technologies.** Some chain interviewees reported that they first roll out design changes or new technologies at locations with the greatest savings, suggesting that Massachusetts – with both program incentives and relatively high energy costs – may be among the pilot regions. The literature review supports this finding, as national accounts were found to be more aggressive in implementing energy efficient retrofit projects in regions with good rebate programs. These findings suggest that Massachusetts locations may accrue energy savings earlier than elsewhere.

Some C&F customers use standardized plans for new stores, which may necessitate early program intervention. In order to successfully influence the decisions of these chain stores, the programs may need to convince these customers to make changes to all of their locations and not just those located in Massachusetts. This situation emphasizes the importance of early program involvement, as designs that are not included in the base plans are unlikely to be changed for the collection of program incentives.

- **C&F customers with nationwide energy efficiency guidelines in place may still be influenced by the programs.** About one-half of the C&F interviewees reported that their organization had energy efficiency guidelines in place; however, only one-quarter of all interviewees reported that the guidelines were formalized in a written document. In addition, nearly all of the interviewees with corporate energy efficiency guidelines in place said that the guidelines and criteria were consistent nationwide. The NSTAR survey re-analysis found that C&F participants were significantly more likely to have an energy efficiency policy in place than non-C&F customers (70 percent vs. 42 percent); however of those with policies in place, C&F customers were significantly less likely to have written policies than non-C&F customers (36 percent vs. 66 percent). Although most C&F policies apply nationwide, they appear to be more general in nature, and therefore flexible. This suggests that, in most cases, programs retain an opportunity to influence local projects, even if the customer has a national policy in place.
- **C&F customers may have lower barriers to energy efficiency than non-C&F customers.** C&F customers identified several common barriers to energy efficiency – upfront costs, payback period, and lack of capital – that likely apply to non-C&F customers as well. National account managers believe that the barriers faced by C&F customers are similar to other customers, but probably are less steep because of their greater financial and staffing resources. However, one concern that may be unique to chains is the impact of design changes on the quality of their customers’ experiences. Some of the larger chain interviewees reported that all new equipment, especially lighting, must be tested before it is implemented in a widespread fashion.
- **It appears that the level of program influence does not vary by measure type between C&F and non-C&F customers.** The literature review found that, for the 2005 National Grid programs, free-ridership for new construction lighting purchases was significantly lower for C&F customers than for other commercial customers, though free-ridership for new construction HVAC was significantly higher for C&F customers. However, C&F respondents interviewed for this study reported no substantial difference in decision-making process by measure type; they did report differences for equipment

replacement vs. new construction. In addition, interviewees provided similar program influence ratings (about a seven on a ten-point scale) regardless of equipment type. Lastly, the NSTAR survey re-analysis found no difference in free-ridership for lighting vs. non-lighting measures. The weight of the evidence suggests that program influence does not differ by measure type between C&F customers and non-C&F customers.

8.2.2 Suggestions for Phase 2 Research

In light of the conclusions, we present suggestion to consider for the Phase Two research.

Given the uncertainty regarding the level of program influence for C&F customers and the potential energy savings this sector offers, we suggest conducting the following research activities in Phase Two of the market characterization study. These research activities will provide an assessment of the current participation patterns for all C&F customers across the entire state, in-depth knowledge of select target markets (e.g. grocery and healthcare) and NTGR for selected C&F market sectors.

We suggest implementing these research activities using a step-by-step approach, where the results of the initial tasks inform the decision to continue with, as well as the approach for, the subsequent tasks.

- Analyze recent Mass Save program tracking data in order to better understand the participation patterns of C&F customers in Massachusetts programs. While we found that C&F customers represented about 20 percent of NSTAR participants and electricity savings from a 2004-2007 survey sample, it is important to assess the current level of C&F participation across the entire state. This analysis will provide recent statewide estimates regarding the percent of projects, as well as electric and gas savings, accounted for by C&F customers. It also will provide information on C&F projects compared to non-C&F projects regarding equipment replacement vs. new construction, measure type, and prescriptive vs. custom tracks.
- Conduct a telephone survey of recent Mass Save program participants in order to develop NTG Ratios for C&F participants vs. non-C&F participants, and thus, provide a more complete assessment of program influence. While the NSTAR survey re-analysis provided some insight into the question of free-ridership, the studies on which the analysis was based were not designed to support such an analysis and therefore did not provide a sufficient sample of C&F customers. In addition, the survey results are now several years out of date.

Rather than implementing a separate study, an option to consider is an expansion of the annual C&I NTG study to include targeted analyses of the C&F market. More specifically, we suggest oversampling C&F customers to ensure sufficient sample sizes are obtained to perform statistically meaningful comparisons. This may require surveys across multiple program years. In addition, it may be worthwhile to target only chains (and exclude franchises), or even target solely grocery and healthcare chains, in order to provide more detail about sectors that appear to have the greatest potential for future energy savings. Food stores (which includes grocery stores) represent about 18 percent of all C&F locations in Massachusetts, and hospital/healthcare facilities represented 6 percent of construction projects and 13 percent of construction value. To the extent possible, we will compare NTGR by C&F sector and measure type. The sample could be developed in conjunction with the program data analysis task presented above.

- We suggest continuing with the on-site tasks proposed in the 2010 LCIEC Project 1B Work Plan. These tasks will provide greater clarity regarding the influence of the Massachusetts programs by comparing the efficiency level of equipment installed at C&F locations in Massachusetts and a comparison state(s). We anticipate that this study would be approached in a case study fashion, by comparing the results from a Massachusetts location to a non-program location for the same C&F customer. These results will allow us to compare the efficiency level of the same equipment installed at Massachusetts and non-program locations owned by the same C&F customer. In addition, we will compare the decision-making process behind equipment purchases to understand in detail why the efficiency of equipment installed is or is not different at Massachusetts locations.

In order to reduce study costs, we suggest integrating these on-sites with the on-sites planned for the new construction market characterization study, again by oversampling C&F customers. It may be more valuable to target chains, particularly grocery and healthcare chains. However, the details of this plan will likely be shaped by the results of the earlier research tasks.

- On-sites at C&F locations in Massachusetts. These on-site visits will assess program effects on the adoption of efficient equipment and design practices at C&F locations in Massachusetts. In addition, after each site visit, we will conduct a follow-up interview with the decision-maker(s) responsible for energy management decisions at the site visited.

-
- On-sites at C&F locations in comparison markets. These site visits will mirror those conducted in Massachusetts and also will include follow-up interviews with decision-maker(s). Comparison region(s) will be selected based on the presence of similar C&F customers and screened to ensure that there is no history of C&I programs. Ideally, comparison areas will have similar electric and gas rates as Massachusetts.

Appendix A Literature Review Sources

PA Consulting. *National Accounts Study: Customer Energy Efficiency Equipment Decision Making Process and Standard Practice-Final*. Prepared for National Grid, September 8, 2006.

PA Consulting. *National Accounts Study: HVAC Customer Energy Efficiency Equipment Decision Making Process and Standard Practice-Final Report*. Prepared for National Grid, July 5, 2007.

Quantum Consulting Inc., *Market Assessment of the Independently Owned Retail Food Sector in the Pacific Northwest*. Prepared for CARES, December 2000.

Research Into Action. *Better Bricks Grocery Initiative: Market Progress and Evaluation Report #3*. Prepared for Northwest Energy Efficiency Alliance. February 15, 2008.

KEMA-XENERGY. *Assessment of the Commercial Building Stock in the Pacific Northwest*. Prepared for Northwest Energy Efficiency Alliance. March 8, 2004.

Energy and Environmental Analysis. *National Account Sector Energy Profiles*. Submitted to Oak Ridge National Laboratory. April 2003.

Appendix B Additional NTGR Re-Analysis Results

This appendix presents additional results from the re-analysis of past NSTAR C&I impact evaluation interview data. The objective of the re-analysis was to investigate Free-ridership; however KEMA also calculated Participant Spillover rates and Net-to-Gross Ratios and present them in this appendix without further discussion

B.1. Participant Spillover Results

This section presents the Participant Spillover Results. Since 2003, the assessment of net program effects for C&I programs in Massachusetts has been performed in accordance with the Massachusetts electric PAs' joint study titled, *Standardized Methods for Free-Ridership and Spillover Evaluation* (Standardized Methods report).^{43,44} The Standardized Methods report provides guidelines and methodology for the estimation of Participant "Like" Spillover and Participant Free-ridership. The effects of Participant Spillover are estimated from responses to survey questions and applied to the adjusted gross savings to determine the Participant Spillover for each project.

The results of the analyses of Participant Spillover are presented separately for:

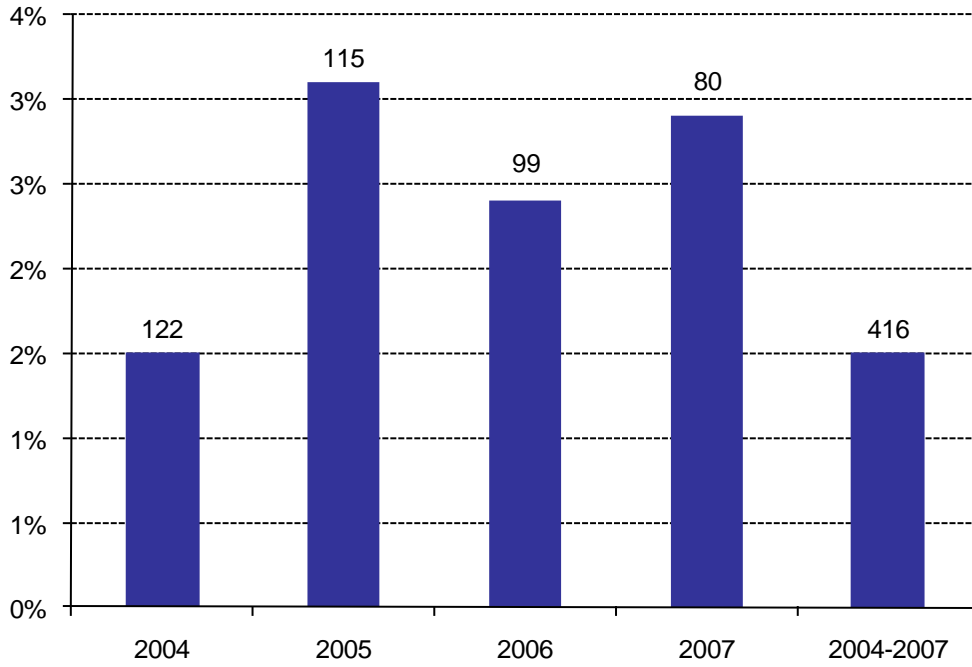
- Overall Participant Spillover
- C&F vs. Non-C&F
- C&F vs. Non-C&F by Measure Type (Lighting vs. Other End Uses); and
- C&F vs. Non-C&F by Market Segment (Healthcare, Grocery, Retail, and Other).

⁴³ National Grid, NSTAR Electric, Northeast Utilities, Unitil, Cape Light Compact. Standardized Methods for Free-Ridership and Spillover Evaluation-Task 5 Final Report (Revised). June 16, 2003.

⁴⁴ The authors of this report assume the reader is familiar with the Standardized Methods report.

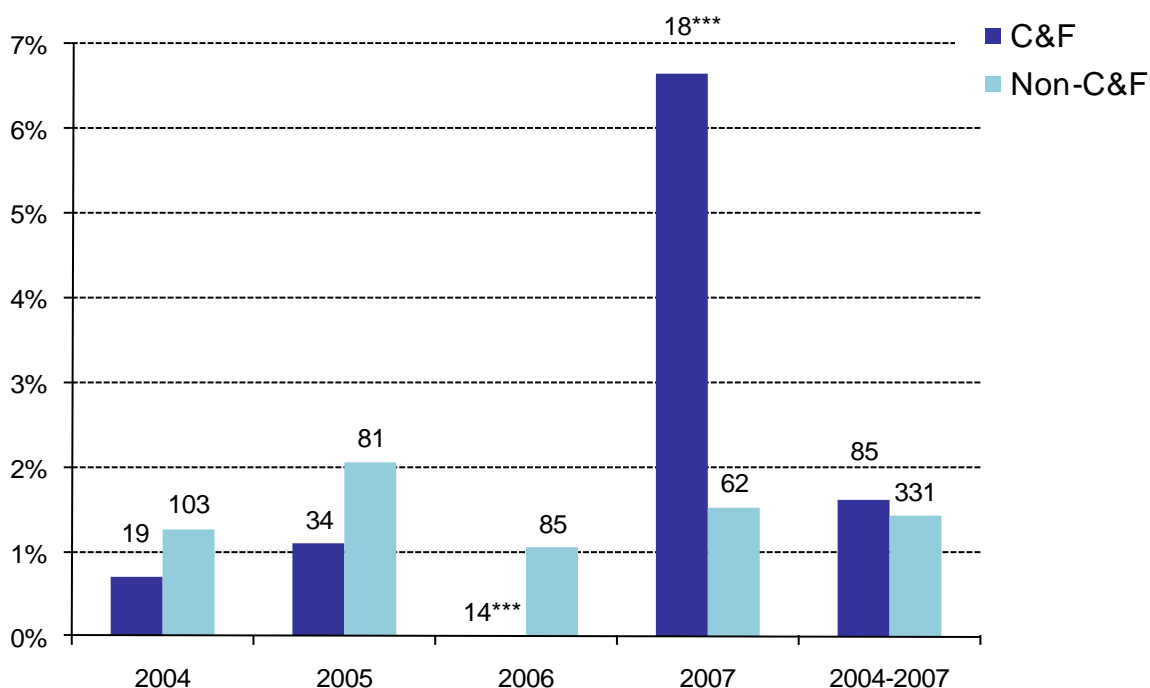
B.1.1. Overall Participation Spillover Results

Figure B-1: NSTAR Participant Spillover Results-
2004-2007



B.1.2. C&F vs. Non-C&F

**Figure B-2: NSTAR Participant Spillover Results
2004 – 2007, C&F vs. Non-C&F**



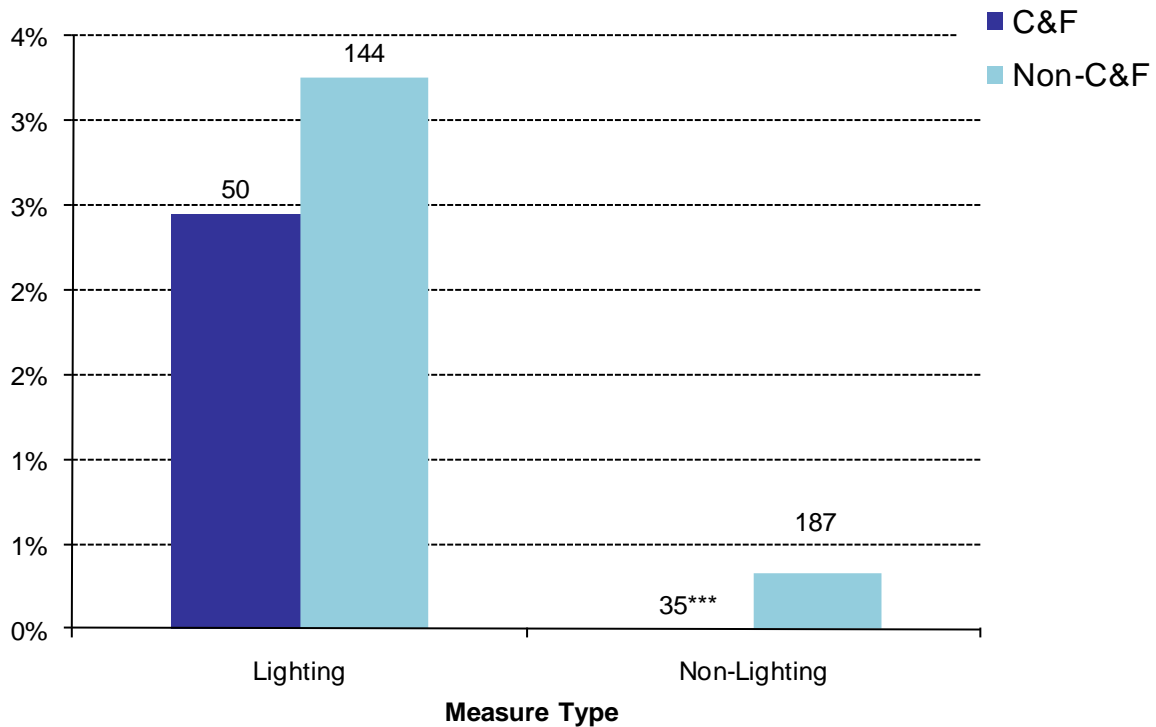
*** The C&F and Non-C&F results are statistically different from each other at the 99 percent level of confidence.

**Table B-1: NSTAR Participant Spillover Results-
2004 – 2007, C&F vs. Non-C&F**

Program year	C&F	Non-C&F	Diff	t-stat	Conf Level
2004	1%	1%	-1%	0.51	39%
2005	1%	2%	-1%	0.70	52%
2006	0%	1%	-1%	4.51	100%
2007	7%	2%	5%	3.53	100%
2004-2007	2%	1%	0%	0.30	24%

B.1.3. C&F vs. Non-C&F by Measure Type

Figure B-3: NSTAR Participant Spillover Results- 2004–2007, C&F vs. Non-C&F by Measure Type



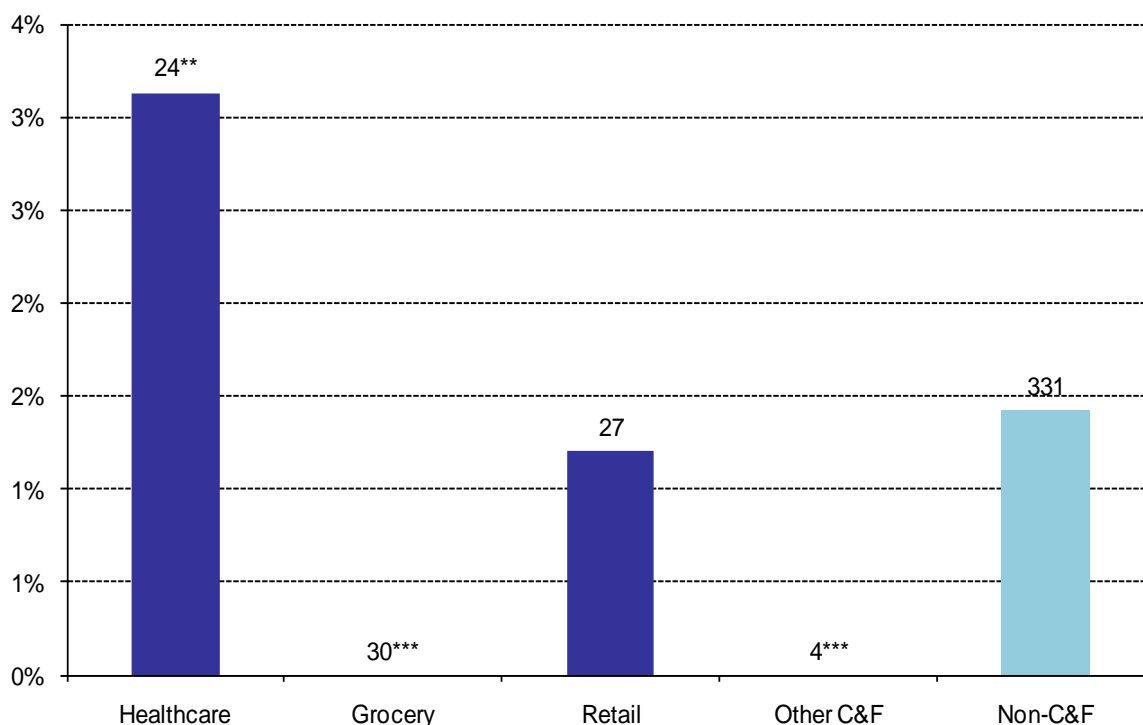
*** The C&F and Non-C&F results are statistically different from each other at the 99 percent level of confidence.

Table B-2: NSTAR Participant Spillover Results- 2004–2007 C&F vs. Non-C&F by Measure Type

Measure Type	C&F	Non-C&F	Diff	t-stat	Conf Level
Lighting	2%	3%	-1%	0.55	41%
Non-Lighting	0%	0%	0%	4.30	100%

B.1.4. C&F vs. Non-C&F by Market Segment

Figure B-4: NSTAR Participant Spillover Results- 2004–2007 C&F vs. Non-C&F by Market Segment



** The C & F market segment result and the overall Non-C&F result are statistically different from each other at the 95 percent level of confidence.

*** The C&F market segment result and the overall Non-C&F result are statistically different from each other at the 99 percent level of confidence.

Table B-3: NSTAR Participant Spillover Results- 2004–2007 C&F vs. Non-C&F by Market Segment

Market Segment	Participant Spillover	Comparison with Non-C&F		
		Diff	t-stat	Conf Level
Healthcare	3%	2%	1.63	98%
Grocery	0%	-1%	2.80	99%
Retail	1%	0%	0.22	17%
Other C&F	0%	-1%	2.80	99%
Non-C&F	1%	NA	NA	NA



Appendices

B.2. NTGR Results

This section presents the NTGR Results. Since 2003, the assessment of net program effects for C&I programs in Massachusetts has been performed in accordance with the Massachusetts electric PAs' joint study titled, *Standardized Methods for Free-Ridership and Spillover Evaluation* (Standardized Methods report).^{45,46} The Standardized Methods report provides guidelines and methodology for the estimation of Participant "Like" Spillover and Participant Free-ridership. The effects of Free-ridership and Participant Spillover are estimated from responses to survey questions and applied to the adjusted gross savings to determine the NTGR for each project.

The results of the analyses of NTGR are presented separately for:

- Overall NTGR
- C&F vs. Non-C&F
- C&F vs. Non-C&F by Measure Type (Lighting vs. Other End Uses); and
- C&F vs. Non-C&F by Market Segment (Healthcare, Grocery, Retail, and Other).

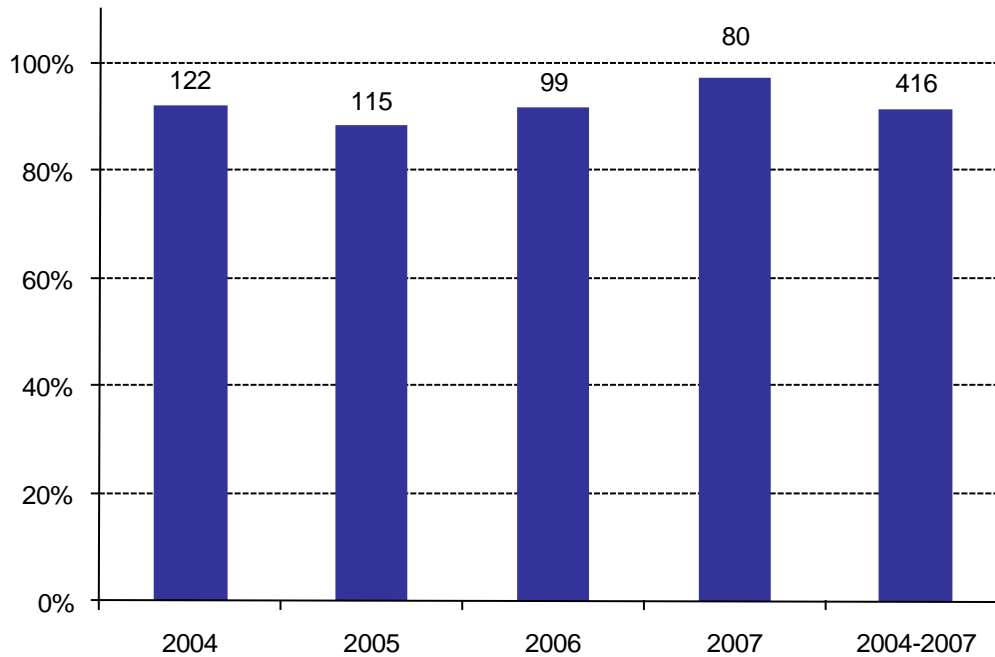
⁴⁵ National Grid, NSTAR Electric, Northeast Utilities, Unutil, Cape Light Compact. Standardized Methods for Free-Ridership and Spillover Evaluation-Task 5 Final Report (Revised). June 16, 2003.

⁴⁶ The authors of this report assume the reader is familiar with the Standardized Methods report.

Appendices

B.2.1. Overall NTGR Results

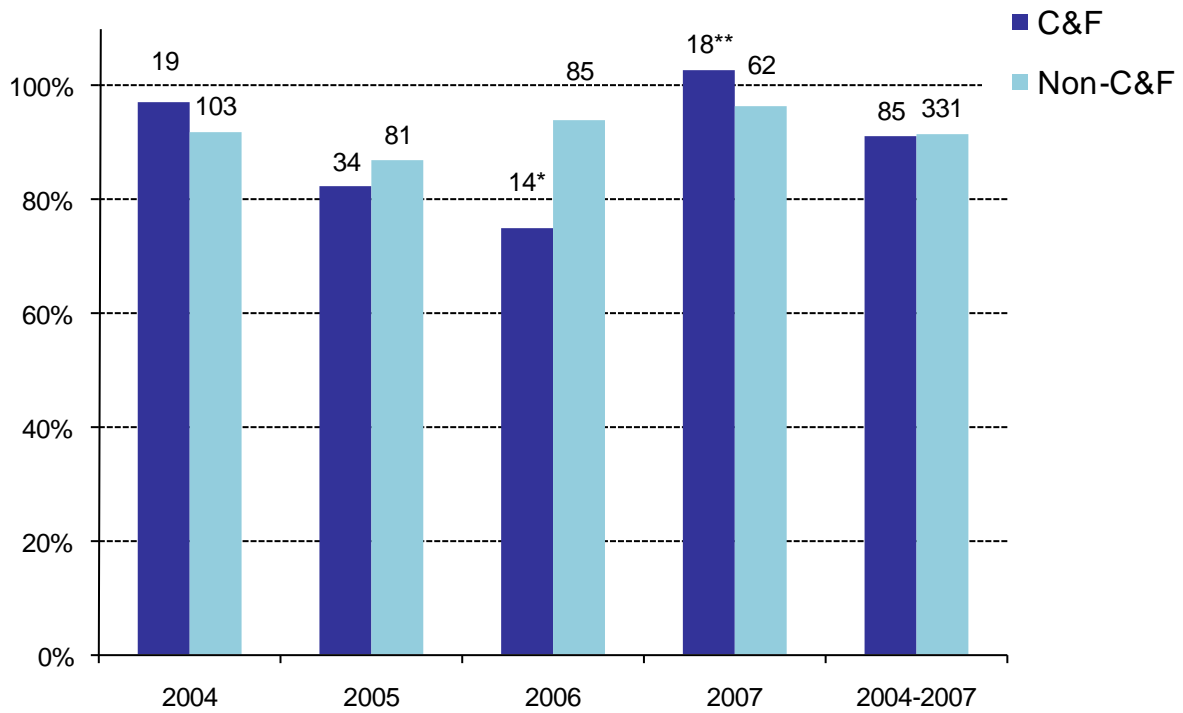
Figure B-5: NSTAR NTGR Results, 2004-2007



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B.2.2. C&F vs. Non-C&F

Figure B-6: NSTAR NTGR Results, 2004 – 2007
C&F vs. Non-C&F



- * The C&F and Non-C&F results are statistically different from each other at the 90 percent level of confidence.
- ** The C&F and Non-C&F results are statistically different from each other at the 95 percent level of confidence.

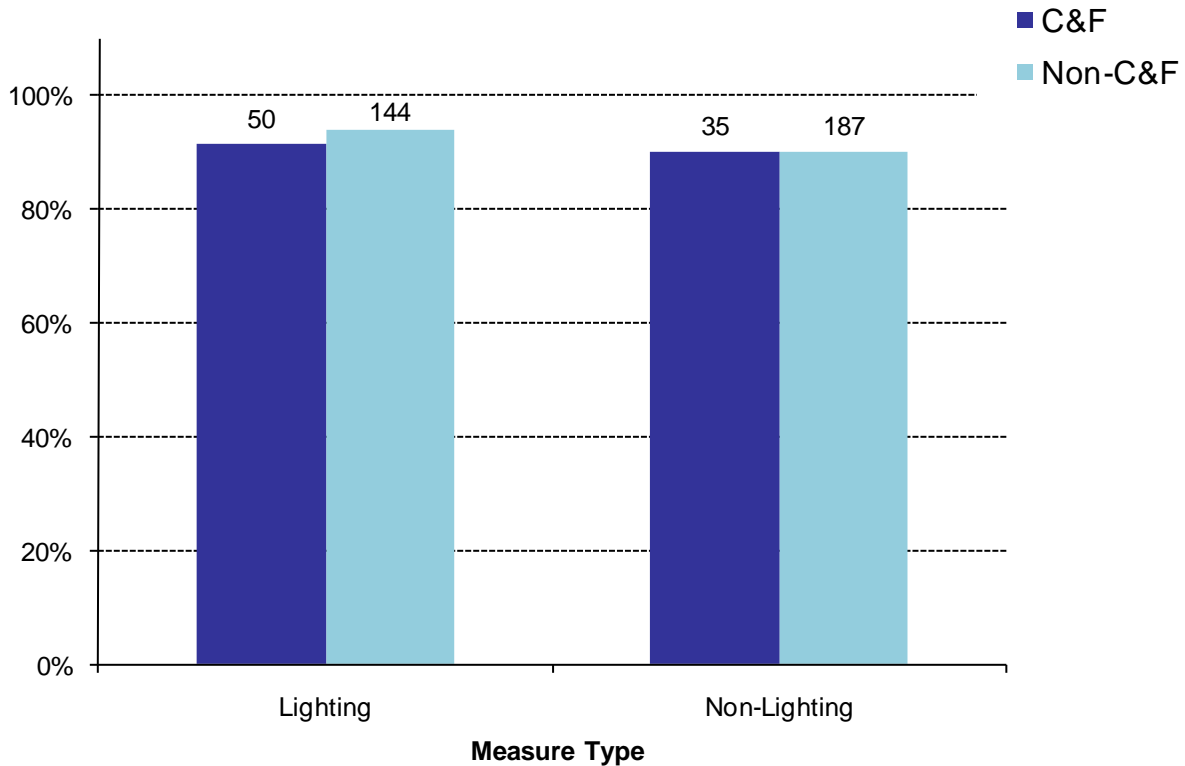
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**Figure B-7: NSTAR NTGR Results-
2004 – 2007, C&F vs. Non-C&F**

Program year	C&F	Non-C&F	Diff	t-stat	Conf Level
2004	97%	92%	5%	1.54	88%
2005	82%	87%	-5%	0.59	45%
2006	75%	94%	-19%	1.67	90%
2007	103%	96%	7%	2.24	97%
2004-2007	91%	92%	-1%	0.19	15%

B.2.3. C&F vs. Non-C&F by Measure Type

**Figure B-8: NSTAR NTGR Results
2004–2007, C&F vs. Non-C&F by Measure Type**



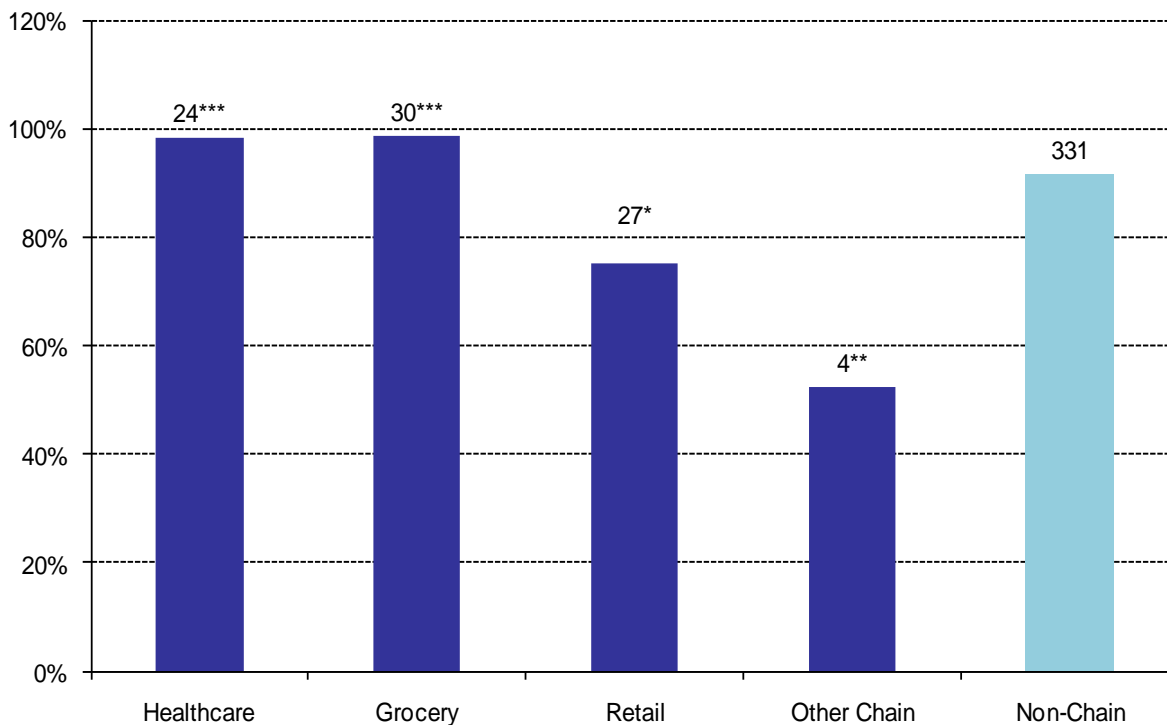
Appendices

**Figure B-9: NSTAR NTGR Results-
2004–2007, C&F vs. Non-C&F by Measure Type**

Measure Type	C&F	Non-C&F	Diff	t-stat	Conf Level
Lighting	91%	94%	-3%	0.52	40%
Non-Lighting	90%	90%	0%	0.01	1%

B.2.4. C&F vs. Non-C&F by Market Segment

**Figure B-10: NSTAR NTGR Results-
2004–2007, C&F vs. Non-C&F by Market Segment**



- * The C&F market segment result and the overall Non-C&F result are statistically different from each other at the 90 percent level of confidence.
- ** The C& F market segment result and the overall Non-C&F result are statistically different from each other at the 95 percent level of confidence.

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*** The C&F market segment result and the overall Non-C&F result are statistically different from each other at the 99 percent level of confidence.

**Figure B-11: NSTAR NTGR Results-
2004–2007, C&F vs. Non-C&F by Market Segment**

Market Segment	NTGR	Comparison with Non-C&F		
		Diff	t-stat	Conf Level
Healthcare	98%	7%	2.51	99%
Grocery	99%	7%	4.22	100%
Retail	75%	-16%	1.85	93%
Other C&F	52%	-39%	1.97	95%
Non-C&F	92%	NA	NA	NA



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Appendix C National Account Manager Interview Guide

NATIONAL ACCOUNT MANAGER INTERVIEW GUIDE MASSACHUSETTS LCIEC EVALUATION – FEBRUARY 2011

Name _____

Organization _____

Phone _____

Date _____

[NOTE: THE QUESTIONS IN THIS INTERVIEW GUIDE WILL NOT NECESSARILY BE READ VERBATIM BUT MAY BE MODIFIED TO SUIT THE INTERVIEW. IN ADDITION THE INTERVIEWERS MAY SKIP QUESTIONS THAT ARE LESS RELEVANT TO A PARTICULAR INTERVIEW]

I'm here as part of the team evaluating the Massachusetts large commercial and industrial programs. I would like to talk with you about your national account customers, as well as local chains and franchises. For purposes of our evaluation, we will collectively refer to all these customers as "chains and franchises".

Please be aware that the information you provide will be treated as confidential.

Introduction

1. In your position, what are your primary responsibilities for large C&I customers?
 - a. What is your role regarding the large C&I energy efficiency programs?
 - i. For retrofit projects?
 - ii. For new construction projects?
 - b. How do you interact with energy efficiency program staff?
 - i. How frequently?
 - ii. And about what issues?

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2. What type(s) of large C&I customers have you worked with?
 - a. All customers or only certain sectors?
 - i. [PROBE: We have identified five C&F sectors of interest to our research: Retail, Restaurant, Grocery, Lodging, & Healthcare sectors.]
 - ii. Within the sectors I just mentioned, have you worked with chain & franchise customers, non-chain & franchise customers, and/or both?
 - iii. Which customers do you consider as your key accounts among chain and franchise customers (e.g.: Best Buy, Wal-Mart, etc.)?
 - b. Are your customers located across the entire service area or a specific region?
 - i. [IF REGION] What region?

Throughout the remainder of the interview I will ask you to describe any differences between your C&F and non-C&F customers; and any variations by the C&F sectors that we are interested in (i.e., Retail, Restaurant, Grocery, Lodging, & Healthcare).

[INTERVIEWER NOTE: FOR ALL RELEVANT QUESTIONS AND INTERVIEWEES (THOSE WITH BOTH C&F AND NON-C&F CUSTOMER) PROBE FOR DIFFERENCES BETWEEN C&F AND NON-C&F, AND TYPES OF C&F. EXAMPLE PROBES:

“any difference between your C&F and non-C&F customers?

“any differences by C&F sectors (i.e., Retail, Restaurant, Grocery, Lodging, & Healthcare)]

- c. Do your customers tend to own or rent their facilities?
 - d. What is the approximate size range of your customers?
 - i. Annual energy use.
 - ii. Total square footage.
3. What are the job titles/positions of the employees at the chain and franchise customers that you typically interact with?
 - a. Are they located in Massachusetts?
 - b. Are they responsible for multiple sites/states/regions?
 - c. How often do you interact with them?
 - d. What are their responsibilities?
 - e. Who do they report to?

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- f. What is their role in the customer's decisions regarding equipment purchases and new construction? Who makes the final decisions? [PROBE standard vs. energy efficient options]

4. At what point in the process of deciding to replace existing equipment, such as lighting, HVAC, or motors, do you tend to become aware of the project?

5. At what point in the process of designing a new building or a major addition do you tend to become aware of the project?

6. Are there any characteristics that are unique to chains & franchises that may influence the way you communicate and interact with them? [PROBE for differences by sector.]
 - a. [IF YES] What characteristics?
 - b. [IF YES] How does this affect your relationship with them?

Decision-Making

1. What types of systems do chain & franchise customers typically replace during remodeling projects?
 - a. Lighting
 - b. HVAC
 - c. Motors
 - d. Controls
 - e. Others: _____

2. When selecting equipment for retrofit or new construction projects what are the primary considerations for C&F customers? [PROBE: payback period, operating costs, product presentation, etc.]

[Interviewer Reminder: Be sure to probe for differences by: C&F and Non-C&F, C&F sector, and retrofit vs. new construction.]

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- a. Can you provide any details about what criteria the chain & franchise customers might use in considering these factors? For example, what payback period is required, etc.
3. How many of your chains & franchises customers have corporate energy efficiency guidelines in place? By energy efficiency guidelines, we mean a written policy or a set of instructions that provides guidance in selecting the efficiency level of equipment to install. Please use the following categories:
 - All
 - Most (about $\frac{3}{4}$)
 - Some (about $\frac{1}{2}$)
 - Few (about $\frac{1}{4}$)
 - None
 - a. What do the guidelines cover?
 - i. Lighting
 - ii. HVAC
 - iii. Motors
 - iv. Controls
 - v. New Construction
 - vi. Others: _____
 - b. What do the guidelines specify?
 - i. Lighting
 - ii. HVAC
 - iii. Motors
 - iv. Controls
 - v. New Construction
 - vi. Others: _____
4. Do your chain and franchise customers tend to be more or less aware of current codes and standards than your non-chain and franchise customers? Please explain the differences.



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Program Participation

[Interviewer Reminder: Be sure to probe for differences by: C&F and Non-C&F, C&F sector]

1. Which chain & franchise customers are most likely to participate in energy efficiency programs?
 - a. Why?
 - b. Are there differences for new construction and retrofit program?
 - i. If yes, please explain.

2. For which technologies are the chain & franchise customers more or less likely to obtain program incentives, compared to independently-owned customers?
 - a. Lighting
 - b. HVAC
 - c. Motors
 - d. Controls
 - e. Others: _____
 - i. Please explain any differences? [PROBE: Why C&F customers are more or less likely to install certain measures?]

3. Do you think the level of free-ridership for chain & franchise customers is lower, higher, or the same as similar non-chain and franchise customers? We define a free rider as a program participant that would have installed the same energy efficient measure at the same time in the absence of the program.
 - a. [IF LOWER OR HIGHER] How do the levels vary?
 - i. Probe by sector: retail, restaurant, grocery, lodging, healthcare
 - ii. Probe by measure type: lighting, HVAC, motors, controls, etc.
 - b. [IF LOWER OR HIGHER] Why do the levels vary?

4. Why do chain & franchise customers decide *not* to participate in programs?

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- a. Are their reasons for *not* participating any different from those of similar independent customers?
 - i. [IF YES] How so?
 - b. Are there any issues that are unique to chains & franchises that may influence their program participation?
 - i. [IF YES] What issues?
 - ii. [IF YES] If possible, probe by sector
5. How can the Program Administrators increase program participation in the chain & franchise sector?

Chain & Franchise Management Interviews

1. We are planning to conduct telephone interviews with energy decision-makers at chain & franchise customers. For which chain & franchise customers could you provide contact information for these interviews? [Record company, name, phone number, and email address in the table at the end. It may be easier to obtain via email later.]
2. Is there any information that you would like to learn about chain & franchise customers that we could ask during these interviews?
3. What type of information do you think is reasonable to obtain through these chains & franchise interviews? We plan to ask questions about:
 - a. Corporate equipment selection policies regarding energy efficiency
 - b. Energy decision-making
 - c. Program participation
 - d. Firmographics
4. Do you think the chain & franchise customers may have concerns that will prevent them from sharing information during the interviews?
 - a. If so, what are their concerns?
 - b. Is there any way we can alleviate these concerns?



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5. Do you have any suggestions on how to encourage cooperation for these interviews from the chain & franchises contacts?

6. Do you have any suggestions about additional sources of information we should explore regarding chains and franchises?
 - a. [IF YES] What sources?

7. Finally, is there anything else you would like to tell me about chains & franchises that we haven't already discussed?

Contact information for Chain & Franchise Management Interviews

Company	Name	Phone	Email



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Appendix D Customer Interview Guide

CHAIN & FRANCHISE MANAGEMENT INTERVIEW GUIDE MASSACHUSETTS LCIEC EVALUATION – MARCH 2011 FINAL

Name _____
Organization _____
Phone _____
Date _____

Hi, my name is _____ calling from NMR on behalf of the Massachusetts electric and gas utilities' Energy Efficiency Program Administrators. [If asked, say: We are working directly for National Grid, NSTAR, Western Mass Electric, Unitil, Cape Light Compact, Berkshire Gas, New England Gas, and Columbia Gas.] We are conducting research to better understand the energy related decision making practices of chain and franchises. As part of this research we are interviewing decision-makers from key chain and franchise companies operating in Massachusetts.

The objective of these interviews is to learn about your decision-making processes, corporate policies, and participation in energy efficiency programs offered by the Massachusetts electric and gas utilities.

We anticipate this interview will last about 30 minutes. In appreciation of your time we will make a \$50 donation in your name to a charity of your choice.

The information you provide will be treated as confidential.

SCREENING

SC1. Are you the person who is most knowledgeable about [company]'s decision making processes, corporate policies, and participation in energy efficiency programs offered by the Massachusetts gas and/or electric utilities?

SC2. [If Not] We would like to talk to the person who is the most knowledgeable about your company's decision making processes, corporate policies, and participation in energy efficiency programs offered by the Massachusetts gas and/or electric utilities? Could you give me the name and telephone number of this person?

Name: _____
Telephone #: _____



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(Note: Thank and terminate call. Schedule interview with best contact.)

INTRODUCTION

I would like to ask you a few questions about your role.

1. What is your job title?
2. What are your responsibilities in your organization?
3. How long have been in this position?
4. What regions are you responsible for? [Probe part or all of Massachusetts, other regions]



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DECISION-MAKING

Now I would like to ask you some questions about your organization’s decision-making processes for equipment, practices, and facility changes that affect energy use.

5. For your Massachusetts locations, who typically makes initial suggestions or identifies opportunities for ...? [Mark only one response with “X”]
6. Who makes the FINAL decision? [Mark only one response with “XX”]

	Equipment Replacement	New Constr	Lighting	HVAC	Motors	Controls	Other:
The Respondent							
Corporate energy manager							
Corporate financial staff							
Corporate management							
Corporate real estate mgmnt							
Local store management							
Local store facility staff							
Consultant/vendor/manufacterer							
Other:							
Other:							

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7. For your Massachusetts locations, what factors are considered in the decision regarding...? [Multiple response; Mark each response with “X”] [DO NOT READ LIST OF FACTORS]
8. What is the SINGLE MOST IMPORTANT factor in the decision? [Mark only one response with “XX”]

	Equipment Replacement	New Constr	Lighting	HVAC	Motors	Controls	Other:
Payback period or ROI							
Total life cycle costs							
Operating costs							
Initial cost							
Maintenance cost							
Equipment warranties							
Longevity of equipment							
Ability to duplicate (standard design)							
Product presentation							
Meets code requirements							
Recommendation of consultant, vendor, etc							
Availability of rebate							
Corporate responsibility							
Sustainable, “green”, or helps environment							
Other: [SPECIFY]							
Other: [SPECIFY]							

9. [ASK FOR EACH TOP FACTOR FROM Q8] Can you explain how your organization considers this factor in your decisions? For example, what payback period or ROI rate is required, do you select the model that provides the lowest life cycle cost or initial cost, or the model that meets the minimum efficiency required to receive a rebate? [Probe by item (lighting, HVAC, motors, new construction, etc).]

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10. Are your decision-making processes consistent nationwide [or region-wide if a regional organization]?
- 1) Yes
 - 2) No
 - 3) Don't Know
11. [ASK IF Q10 = No] Does it vary by region? [Probe for differences in Mass. vs. other states; program state vs. non-program states]
12. [ASK IF Q10 = No] How does it vary? [Probe for specific differences in decision-makers or factors/criteria]
13. [ASK IF Q10 = No] Why does it vary?
14. Does your organization negotiate prices with Massachusetts vendors on frequently used types of equipment?
- 1) Yes
 - 2) No
 - 3) Don't Know
15. [ASK IF Q14 = Yes] Does this negotiation vary by region? [Probe for differences in Mass. vs. other states; program state vs. non-program states]
16. [ASK IF Q14 = Yes] What are the names of the key vendors you use frequently in Massachusetts?
17. What are the barriers that limit increasing the efficiency of equipment, practices, and facilities? [Probe by item. Probe higher cost, lack of capital, inability to obtain financing, lack of technical expertise, logistical issues, etc]



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CORPORATE SUPPORT

I would like to ask you some questions about corporate support.

18. Who typically makes initial suggestions or identifies spaces to purchase or lease for new locations? [Mark only one response]

19. Who makes the FINAL decision? [Mark only one response]

	Initial Suggestions	Final
The Respondent		
Corporate energy manager		
Corporate financial staff		
Corporate management		
Corporate real estate mgmnt		
Local store management		
Local store facility staff		
Consultant/vendor/manufacturer		
Other:		
Other:		

20. Does corporate provide support to the local stores in identifying and negotiating for space?

- 1) Yes
- 2) No
- 3) Don't Know

21. [ASK IF Q20 = Yes] What type of support? [Probe real estate expertise, analysis of space needs, analysis of comparable prices or rents, etc]

22. Are there standard types of equipment or services that your organization seeks in negotiating purchases or leases?

- 1) Yes
- 2) No
- 3) Don't Know

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23. [ASK IF Q22 = Yes] What type of equipment or services? [Probe public parking, access to public transportation, space for specific business needs (refrigeration, warehouse, labs, etc), capacity of utility service]
24. Is electricity and gas service typically included in the lease or do you pay them directly?
- 1) Electricity included in lease
 - 2) Gas included in lease
 - 3) Neither electricity nor gas included in lease
 - 4) Other : _____
 - 5) Don't Know
25. Are there standard lease terms that your organization seeks in negotiating leases?
- 1) Yes
 - 2) No
 - 3) Don't Know
26. [ASK IF Q25 = Yes] What are these terms? [Probe # years, other lease requirements & conditions]
27. Does corporate provide support for on-going energy management?
- 1) Yes
 - 2) No
 - 3) Don't Know
28. [ASK IF Q27 = Yes] What type of support? [Probe consolidation or analysis of energy bills, benchmarking of energy performance, etc.]

CORPORATE POLICIES

I would like to ask you some questions about corporate policies.

Appendices

29. Does your organization have corporate energy efficiency guidelines in place? By energy efficiency guidelines, I mean a policy or a set of instructions that provides guidance in selecting the efficiency level of equipment.

	Yes	No	Don't Know
Lighting			
HVAC			
Motors			
Controls			
New Construction			
Other:			

30. [ASK IF Q29 = Yes] Are these guidelines formalized in a written document?

	Yes	No	Don't Know
Lighting			
HVAC			
Motors			
Controls			
New Construction			
Other:			

30b. [ASK IF Q29 = Yes] [ASK - LIKE A PROBE:] How are these guidelines enforced?
 [Probe: If EE is too expensive are they ignored? Are they enforced regularly? Are they only enforced when additional funding is available?]



Appendices

31. [ASK IF Q29 = Yes] What do the guidelines typically specify? [Probe for required efficiency level, cost-effectiveness criteria, etc.]

Lighting:
HVAC:
Motors:
Controls:
New Construction:
Other:

32. [ASK IF Q29 = Yes] Are these guidelines and criteria consistent nationwide?

- 1) Yes
- 2) No
- 3) Don't Know

33. [ASK IF Q32 = No] Does it vary by region? [Probe for differences in Mass. vs. other states; program state vs. non-program states]

34. [ASK IF Q32 = No] How do the guidelines and criteria vary? [Probe for specific differences in policies and criteria]

35. [ASK IF Q32 = No] Why do the guidelines and criteria vary?

PROGRAM PARTICIPATION

Now I would like to ask you some questions about your participation in the Massachusetts energy efficiency programs offered by your local gas and/or electric utility.

36. Are you familiar with the utility energy efficiency programs offered in Massachusetts?

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- 1) Yes
- 2) No
- 3) Don't Know

37. [ASK IF Q36 = Yes] Has your organization participated in these Massachusetts energy efficiency programs?

- 1) Yes
- 2) No
- 3) Don't Know

38. [ASK IF Q37 = Yes] Why do you participate?

39. [ASK IF Q37 = Yes] What benefits do you receive by participating in the programs? [Probe for responses besides financial incentives.]

40. [ASK IF Q37 = Yes] On a scale of 0 to 10, where 0 means "very dissatisfied" and 10 means "very satisfied", how satisfied are you with the programs?

Record Number: _____

41. [ASK IF Q40 ≤5] Why are you dissatisfied?

42. [ASK IF Q40 >5] Why are you satisfied?

43. [ASK IF Q36 = Yes] Are there any obstacles that prevent you from participating in the programs to a greater degree?

- 1) Yes
- 2) No
- 3) Don't Know

44. [ASK IF Q43 = Yes] What are these obstacles?



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45. [ASK IF Q37 = Yes] On a scale of 0 to 10, where 0 means “not influential at all” and 10 means “very influential”, how influential are the programs on your decisions to install energy efficient equipment in your Massachusetts facilities? [Probe by item.]

	Record Number
Lighting	
HVAC	
Motors	
Controls	
New Construction	
Other:	

[ASK IF Q37 = Yes] Can you please describe what impact, if any, the programs have had on your decisions to install equipment that received Massachusetts program incentives? [Probes: Are you able to install measures in Massachusetts and not other regions because of the programs? Are you investing more in Massachusetts facilities than other regions due to program incentives?]

Lighting:
HVAC:
Motors:
Controls:
New Construction:
Other:



Appendices

46. [ASK IF Q36 = Yes] Were you aware that the energy efficiency programs in Massachusetts now offer a consistent statewide design across all service territories that includes incentives for equipment that save both electricity and natural gas?

- 1) Yes
- 2) No
- 3) Don't Know

46b. [ASK IF Q46 = Yes] Has this program integration affected your participation in any way?

- 1) Yes
- 2) No
- 3) Don't Know

47. [ASK IF Q46b = Yes] How has it affected your participation?

FIRMOGRAPHICS

I have just a few more questions to ask you.

48. How many facility locations are you responsible for overseeing in Massachusetts? [Probe for number]

49. What is the square footage of these facilities in Massachusetts? [Probe for total amount, or average facility size]

50. About what percent of the floor space in these Massachusetts facilities is owned vs. rented? [Should total 100 percent]

% Owned: _____

% Rented: _____

51. What are the primary activities conducted at these facilities in Massachusetts? [Accept multiple responses]

- 1) Retail sales & service
- 2) Restaurant/food service
- 3) Hotel/Motel



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- 4) Medical
- 5) Grocery Store/food sales
- 6) Warehouse & storage
- 7) Office
- 8) Industrial
- 9) Recreation
- 10) Other [SPECIFY]:

52. About how many full-time equivalent employees work at these locations in Massachusetts?
[Probe for best estimate]

CHARITY DONATION

That was my last question. Thank you for taking the time to speak with me. As I mentioned earlier, we will donate \$50 in your name to the charity of your choice.

[If respondent specifies a charity, record name and information. If respondent is unsure of charity, prompt with the charities provided below]

- 1) American Red Cross
- 2) United Way
- 3) American Cancer Society

[Record name and mailing address of respondent. Some charities will send a thank you note to donors.]