EVALUATION, MONITORING, AND VERIFICATION (EM&V) REPORT

FOR

THE ENERGY SMART GROCER PROGRAM

Submitted to:

Eli Kollman
California Public Utilities Commission
505 Van Ness Avenue
San Francisco, CA 94102

Submitted by
QUANTUM CONSULTING INC.

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TABLE OF CONTENTS

Section			Page
ES	EXECUTIVE SUMMARY		1
1	INTRODUCTION		6
	1.1	Program Description	6
	1.2	Activities to Date	6
2	APPROACH		7
	2.1	Research Objectives	7
	2.2	Data Sources	8
3	RESULTS		12
	3.1	Program Participation	12
	3.2	Program Impacts	14
	3.3	Process Evaluation	19
	3.4	Market Baseline and Market Evaluation	23
3	CONCLUSIONS AND RECOMMENDATIONS		29
Appendix			
	APPENDIX A: INTERVIEW GUIDES		A-1
	APPENDIX B: DEEMED SAVINGS		B-1
	APPENDIX C: JULY MEMO		C-1

The Energy Smart Grocer (ESG) Program implemented by Portland Energy Conservation, Inc. (PECI) provides information, technical assistance, and financial incentives for independent grocers to purchase and install energy efficient lighting, HVAC, and refrigeration systems. The program is delivered to independent food retailers in the territories of PG&E, SCE, and SDG&E. Since its initiation in late 2002, the ESG program has exceeded its overall goal of lifetime deemed savings of 272,000 MWh, as summarized in Exhibit ES-1.

Exhibit ES-1
Final Summary of Program Results, 3.23.04

	No. of Audits Completed			No. of Stores w/ Rebates/Retrofits			Lifetime Deemed Savings (kWh)		
Utility	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural
All	650	406	244	379	178	201	283,762,659	131,889,438	151,873,221
PG&E	325	184	141	191	80	111	135,213,339	50,517,034	84,696,305
SCE	225	158	67	110	51	59	84,381,716	37,155,125	47,226,592
SDG&E	100	64	36	78	47	31	64,167,604	44,217,279	19,950,325

The ESG program was evaluated by analyzing data collected through a combination of secondary data and program document review, on-site visits to verify installations, and interviews with program staff, participants, and key market actors, consistent with the implementation plan described by PECI and the EM&V goals and budget.

In addition to the overall participation data presented above, program results were analyzed by different segmentation variables, confirming that the program easily exceeded its goal of 20 percent rural participation. Participation was also analyzed by size and ownership structure:

- Results indicate that the ESG program was successful in reaching the smaller, hardest-to-reach segment of the grocer market, with approximately 45 percent of all stores audited falling into the under 10,000 square foot classification.

- Overall, approximately 45 percent of stores audited were single locations, while 12 percent were part of chains with 21 or more locations. Again, this highlights the extent to which the ESG program made progress with the hard-to-reach population.

ES 1. IMPACT EVALUATION RESULTS

Since the ESG program is using Express Efficiency deemed savings for measuring energy savings, the primary emphasis of the M&V activities was on verification of installed measures and therefore program savings. Installation of most measures was confirmed, but the site visits did raise concerns regarding the installation and/or persistence of compact fluorescent (CFL) bulbs, Cooler Miser beverage cooler controllers, and strip curtains on walk-in coolers. Follow-up verification is recommended for these measures.

Deemed savings associated with various categories of measures are presented below.

Exhibit ES-2
Impacts by Measure

Measure	Percentage of Deemed Savings
Lighting	**26.3%**
T8s and T5s	19.4%
Delamping	3.8%
CFLs	1.7%
Other lighting	1.4%
Coolers and Cases	**50.4%**
Low Temp Cases	21.9%
Strip curtains for walk-ins	9.0%
Anti-sweat heater controls	5.8%
Door gaskets	2.1%
Medium Temp Cases	0.7%
Other case measures	11.0%
Refrigeration Systems	**23.1%**
Multiplex compressors	11.0%
Floating head pressure control	8.3%
Efficient condenser	3.5%
Other refrigeration system	0.3%
HVAC	**0.1%**

Measures related to coolers and cases accounted for the largest share of savings from the ESG program. We believe there are two reasons for the greater relative importance of both case-related and other refrigeration measures.

- More stores than anticipated had already done large-scale retrofits from T-12 to T-8 lighting.
- Lighting retrofits were often conducted through other programs that were able to offer higher rebates than provided by the ESG program.

The only measures for which an adjustment is proposed to the program savings are those involving screw-in CFLs. Since approximately 12 percent of rebated CFLs in audited stores could not be confirmed, it is recommended that impacts from these measures be reduced by 12 percent: from 4.9 million kWh to 4.3 million kWh. This would have only a very minor impact on the overall deemed savings from the program and therefore on its cost-effectiveness.

ES 2. PROCESS EVALUATION RESULTS

The process evaluation found a program that was well received by independent grocers, by the major wholesaler targeted by the program, and by vendors. A key finding has been the pivotal role played by the ESG Program's Energy Experts, who have become key players both in the delivery of the program and in the development of relationships between independent grocers and vendors who deliver energy efficiency measures.

Store managers, owners, and other decision makers interviewed during on-site visits in Summer of 2003 and early 2004 consistently expressed a high degree of satisfaction with the ESG program in general and the Energy Experts in particular, as shown below.

Exhibit ES-3
Respondent Rating of Program Elements

	Rebates > $100	Rebates ≤ $100	No Rebates
	(mean ratings)*		
Quality of the store audit	5.6	5.6	5.2
Quality of the recommendations	5.8	5.4	5.1
Technical knowledge of the program staff	5.8	5.2	5.0
Responsiveness of the program staff	5.7	5.4	5.0
The specific measures covered by the program	5.4	5.4	4.9
Paperwork and procedures required to receive incentives	5.7	4.9	4.7
Quality of vendors who provide the recommended equipment/services	5.4	5.5	5.0
Assistance with contractors	5.4	4.9	4.8
Quality of O&M advice provided by Energy Expert	5.6	5.3	5.1

*Respondents were asked to rate each attribute on a 1 to 6 scale, where 1 is very poor and 6 is excellent

Respondents were also asked to rate the value of various program elements in helping overcome barriers to the installation of energy efficient equipment in their stores.

Exhibit ES-4
Perceived Value of Program Elements

	Rebates > $100	Rebates ≤ $100	No Rebates
	(mean ratings)*		
Audits	5.7	5.1	5.2
Technical assistance	5.0	5.2	5.1
Contractor referrals	4.6	5.0	4.5
Project management assistance	4.5	4.8	4.5
Informational brochures	4.0	5.2	4.7
Demonstration stores	4.2	4.6	4.6
Rebates/incentives	5.3	5.7	5.5
Web-based information	3.3	4.4	3.8
Training for staff	4.3	4.6	4.6
Financing	3.8	4.3	4.2

* Respondents were asked: On a scale of 1 to 6, where 1 is not at all helpful and 6 is very helpful, how helpful would you find each of the following in promoting energy efficient equipment at your stores

Consistent with the ratings of ESG program elements analyzed above, respondents gave high ratings to the value of audits, technical assistance, and rebates and incentives.

ES 3. MARKET BASELINE AND MARKET EVALUATION

Using the database created by the ESG Program audits, two prototype stores were developed. Audit results from ten stores in the under-15,000 square foot range were averaged to represent a typical smaller store, while audit results from ten stores in the over-30,000 square foot range were averaged to develop a prototypical larger independent supermarket.

- Results show a relatively high penetration of T8 lighting in these stores, with 70 percent of both large and small stores already having done retrofits of their sales floor lighting. This result confirms the finding by ESG staff of relatively few opportunities for lighting retrofits because the penetration of T8s was already rather high.

- On the other hand, there are ample opportunities in refrigeration. On average, stores had strip curtains on less than 40 percent of walk-in space; about 40 percent of walk-in door and 25-40 percent of case door gaskets required replacement; and less than 25 percent of open cases had night covers. In addition, less than 10 percent of low-temp cases in large stores and none in small stores were high efficiency models, and no stores had the ability to effectively cycle their anti-sweat heaters. Finally, none of the stores were operating multiplex compressor racks with floating head pressure control.

Baseline data were also collected regarding perceived barriers to energy efficiency among store decision makers. Stores receiving rebates of more than $100 reported lower perceived barriers than the other two groups. While the relatively small sample sizes limit the statistical reliability of these results and it is difficult to establish a direct cause and effect relationship between more extensive involvement in the ESG program and reduced barriers, it seems reasonable to assume that at least some of the differences between these groups are due to the fact that stores receiving rebates have overcome barriers they might have perceived earlier.

In addition to baseline issues, the market evaluation analyzed sources of program awareness and decision making among program participants. ESG Energy Experts were cited most often as the source of program awareness among stores that received rebates in excess of $100, while other ESG contacts, both direct mail and phone calls, were most often mentioned by the other two groups of store decision makers.

Reasons for program participation were also investigated, with stores in all categories reporting that they participated in the ESG program to save energy or reduce their utility bills. Relatively few respondents said they participated primarily to take advantage of the rebates. Respondents appear to recognize the growing importance of energy efficiency, with over half saying their energy bills have increased over the past 2-3 years. High-rebate respondents were also somewhat more likely to have longer payback criteria on energy efficiency investments.

ES 4. CONCLUSIONS AND RECOMMENDATIONS

Overall, the Energy Smart Grocer program has been very successful in moving a traditionally underserved market segment toward greater energy efficiency through a carefully designed mix of program elements and a highly responsive adaptive management strategy. Both the results achieved to date and the high degree of satisfaction expressed by respondents regarding

the program overall as well as various program elements indicate that the ESG program strategies are working.

To streamline the participation process, the ESG has made numerous mid-course changes that have made the program more user friendly for stores as well as vendors. As a result, the number of vendors offering qualifying measures to independent grocers has grown significantly since the start of the program. In addition, several major manufacturers have begun to build their cases for the California market to the specifications of the ESG program.

Several new technologies that offer increased energy efficiency to independent grocers have been introduced to and accepted by the market:

- Cooler Miser offers a low-cost solution to reducing energy usage of beverage coolers
- Door Miser provides a cost-effective means of sharply reducing the cost of anti-sweat heaters on low temperature cases
- Several vendors specializing in the repair and replacement of door gaskets have begun to offer their services to independent grocers, usually at a far lower cost than other contractors affiliated with the major manufacturers
- Floating head pressure controls, which were not present in any of the baseline stores, are gaining acceptance among growing numbers of stores.

There is also evidence that program participation appears to reduce the level of barriers perceived by store owners; the more extensively they are involved with the program, the lower their perception of barriers.

One assumption underlying the original program design does not appear to have been true to the extent anticipated. It was thought that wholesalers could play a major role by integrating ESG program offerings with services they already provide to their member stores. In fact, the wholesalers appear to play only a minor part in influencing the energy efficiency decisions of their member stores, and the role originally hypothesized to be played by the wholesalers is being filled by representative of the ESG program. The Energy Experts have become key players in the delivery of energy efficiency awareness and services to the independent grocer sector. They are trusted by owners as a source of unbiased information from a disinterested party, and by vendors as players who have the ear and the respect of the owner.

We believe the GrocerSmart© audit tool and the output it produces have contributed to the credibility of the Energy Experts; store owners repeatedly cited the high quality of both the findings and the format in helping to educate and empower them with regard to energy efficiency.

While almost all the major measures installed were verified during the on-site visits, persistence issues surround several measures, primarily CFLs and to a lesser degree Vendor Misers and strip curtains. We recommend that rebates on the CFLs and Cooler Misers be contingent on verification that the measure has been installed; we also propose that follow-up visits be conducted in the future to assess the extent to which all three of these measures are operating as intended.

1. INTRODUCTION

This report presents the Evaluation, Monitoring, and Verification (EM&V) of the Energy Smart Grocer (ESG) Program implemented by Portland Energy Conservation, Inc. (PECI). It should be noted that many EM&V activities have been conducted in real time, with feedback offered to the program implementation staff as EM&V activities were conducted and results were obtained. This report documents those earlier findings, even though some of them will already have been acted on by the program management.

In the remainder of this first section, we provide an overview of the ESG program, a discussion of the program's goals, and a summary of the program's results to date. The next section describes the approach that was used for the EM&V, including evaluation objectives and data sources. In Section 3, we present the results of the EM&V effort, including a discussion of program participation and results of the market, process, and impact evaluations. Finally, we offer conclusions and recommendations for the program moving forward.

1.1 PROGRAM DESCRIPTION

The Energy Smart Grocer (ESG) Program implemented by Portland Energy Conservation, Inc. (PECI), works in partnership with grocery wholesalers to provide information, technical assistance, and financial incentives for independent grocers to purchase and install energy efficient lighting, HVAC, and refrigeration systems. The program is delivered to independent food retailers in the territories of PG&E, SCE, and SDG&E.

It was originally intended that the wholesaler serving independent grocers would play a pivotal role in delivering the program, to mirror the energy-efficiency expertise that larger chains receive from their in-house corporate support function. In practice, however, the role of the wholesalers has been more limited. While the major wholesalers helped the ESG program become established initially and provided valuable validation and exposure, they have had only minimal involvement in the actual delivery of the program. Instead, the key players in the program have been the ESG program's six Energy Experts and a network of contractors/suppliers. The Energy Experts conduct audits, make recommendations, and provide both technical and project management assistance, while participating contractors provide products and services in the context of the ESG program and incentive structure.

By leveraging the existing relationship between independent grocers and their wholesaler, the ESG program sought to address this hard-to-reach market. The goal for the 2003 program year was to achieve 1050 audits and 525 retrofits, yielding anticipated lifetime deemed savings of 272,000 MWh, according to the CPUC decision approving the program (attachment 3). In addition, a program goal was to have 20 percent of audits, retrofits, and savings in stores located outside major metropolitan areas.

1.2 ACTIVITIES TO DATE

Since its initiation in late 2002, the ESG program has exceeded its overall goal of lifetime deemed savings, as summarized in Exhibit 1-1.

Exhibit 1-1
Final Summary of Program Results, 3.23.04

Utility	No. of Audits Completed			No. of Stores w/ Rebates/Retrofits			Deemed Savings		
	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural
All	650	406	244	379	178	201	283,762,659	131,889,438	151,873,221
PG&E	325	184	141	191	80	111	135,213,339	50,517,034	84,696,305
SCE	225	158	67	110	51	59	84,381,716	37,155,125	47,226,592
SDG&E	100	64	36	78	47	31	64,167,604	44,217,279	19,950,325

After a slow start as the infrastructure to deliver energy efficiency services to independent grocers had to be developed – particularly with regard to refrigeration measures – both the number of audits and the number of rebates increased rapidly. Because of the time involved in implementing many of the higher impact recommended measures, retrofit and rebate activity has been concentrated in the more recent months, with more than half the energy savings coming in the last three months of 2003.

The methods used to evaluate the activities of the ESG program and the results achieved are discussed in the following sections of this report.

2. APPROACH

This section presents the approach that was used for the EM&V activities, including the evaluation objectives and data sources used to achieve them.

2.1 RESEARCH OBJECTIVES

As stated in the CPUC directive, the following are the EM&V objectives of the Commission:

- Measuring the level of energy and peak demand savings achieved
- Measuring cost-effectiveness
- Providing up-front market assessments and baseline analysis, especially for new programs
- Providing ongoing feedback, and corrective and constructive guidance regarding the implementation of programs
- Measuring indicators of the effectiveness of specific programs, including testing of the assumptions that underlie the program theory and approach
- Assessing the overall levels of performance and success of programs
- Informing decisions regarding compensation and final payments
- Helping to assess whether there is a continuing need for the program.

In approaching the above objectives, we explicitly mapped these requirements to the market, process, and impact components of the evaluation in order to: 1) ensure that appropriate resources were allocated to each task, and 2) use those resources efficiently by grouping related tasks and using a single data collection activity to address multiple objectives. This mapping of objectives to the tasks in the evaluation is presented in Exhibit 2-1.

Exhibit 2-1 -- EM&V Objectives and QC Approach

QC Approach / EM&V Objectives	Task 1 Project Initiation and Work Plan	Task 2 Market Evaluation	Task 3 Impact Evaluation	Task 4 Process Evaluation	Task 5 Analysis and Reporting	Task 6 Project Management
Measure level of energy and peak demand savings achieved			●			
Measure cost-effectiveness			●			
Provide up-front market assessments and baseline analysis	●	●				
Provide ongoing feedback regarding program implementation				●		
Measure indicators of program effectiveness		●				
Assess overall levels of performance and success of programs					●	
Inform decisions regarding compensation and final payments					●	
Help assess whether there is continuing need for the program		●			●	
Coordinate with Express Efficiency evaluation	●					●

Note that several of the research objectives fall under more than one of the above tasks, since findings from more than one evaluation activity were used to provide the needed analysis and recommendations.

2.2 DATA SOURCES

The EM&V objectives described above were achieved through analysis of data collected through a combination of secondary data and program document review, on-site visits to verify installations, and interviews with program staff, participants, and key market actors, consistent with the implementation plan described by PECI and the EM&V goals and budget.

Within each of these overall objectives, we identified a number of researchable issues that were addressed by the various data collection tasks and evaluation activities. A mapping of researchable issues to the evaluation activities is presented in Exhibit 2-2.

Exhibit 2-2 -- EM&V Researchable Issues and Evaluation Activities

Data Sources / EM&V Objectives/*Researchable Issues*	Document Review and Secondary Data	On-site Verification	Participant Surveys: Installed Recommended Measures	Participant Surveys: Installed Low-cost Measures	Participant Surveys: Audit only - no installation	Implementation Staff Interviews	Wholesaler Staff Interviews	Industry Observer/ Association Interviews	Manufacturers Rep Interviews	Suppliers/ Service Provider Interviews
Measure level of energy and peak demand savings achieved	●	●	●	●	●					
How do deemed savings compare with calculated impacts?										
What operating patterns/other factors cause impacts to differ?										
Measure cost-effectiveness	●		●	●	●					
Provide up-front market assessments and baseline analysis	●	●	●	●	●		●	●	●	
What are current practices among independent grocers?										
To what extent are EE practices being adopted without the program?										
Provide ongoing feedback regarding program implementation			●	●	●	●	●		●	●
What are the perceived strengths of the program?										
What are the perceived weaknesses of the program?										
Measure indicators of program effectiveness	●	●	●	●	●	●	●		●	●
What are barriers to participation and to installation of EE measures?										
How has the program overcome those barriers?										
To what extent has the program permanently changed the market?										
Assess overall levels of performance and success of programs	●	●				●	●			●
Were program targets attained?										
Do results confirm program theory (ie, leveraging wholesaler relationship)?										
Inform decisions regarding compensation and final payments	●	●								●
Help assess whether there is continuing need for the program	●		●	●	●		●	●	●	●
What barriers remain to EE in the independent grocer market?										
Can the program be extended to other independent stores?										
Coordinate with Express Efficiency evaluation	●					●				

2.2.1 Document Review and Secondary Data

Review and analysis of the "paper trail" for each aspect of the program was useful in providing the evaluation team with a thorough understanding of how the program is being implemented and contributed to the analysis of the effectiveness of program delivery. In addition, a review of program documents provided a basis for comparison to actual processes and procedures described by program participants to determine if the work plan is being implemented as planned. In many cases, Program Staff made appropriate mid-course corrections to the implementation process as new barriers to participation or implementation were encountered; these are documented as part of the EM&V effort. Internal documents were also used as the most accurate source of information on quantitative measures of program activity, such as number of audits conducted and measures installed.

Since the program is using stipulated savings values, program data also serve as the basis for estimated impacts, and by extension for cost-effectiveness calculations. Both of these sets of numbers were reviewed for consistency with the installed equipment observed during on-site visits, as well as for computational accuracy.

Secondary data were also used to help provide a picture of the industry' structure to determine whether program impacts are distributed in a way that is consistent with the distribution of the

independent retail food sector across utility service territories and between urban and rural areas. Statistical sources will be supplemented by a review of the trade press to discern industry trends. For example, the Southern California grocery strike has had a profound impact on the independent grocers targeted by the ESG program; many have seen increases in business and revenues that have made energy efficiency investments possible; others have gone to longer hours or even 24-hour-a-day operation, which affects the savings attributable to many installed measures.

2.2.2 Primary Data

Primary data were collected from program staff, program participants, and other market actors. The ESG Program has built strong relationships with multiple market players, including not only the independent grocers themselves, but also installation contractors, equipment suppliers, equipment manufacturers, and the wholesalers who supply independent stores. These relationships were tracked to determine whether program messages were received and practices were affected. We used both site visits and telephone interviews with store decision makers and other players as our method of collecting primary data.

The following groups of market actors were the subject of primary data collection efforts.

Program Staff and Subcontractors—We maintained regular contact with EnergySmart Grocer Program staff for the duration of the EM&V effort, and periodically conducted more formal interviews with the Energy Experts to get their insights into program progress, adjustments, and challenges. In addition, members of the EM&V spent at least two days visiting stores with each of the six Energy Experts, observing their interaction with store decision makers and their ongoing marketing of ESG offerings. In total, more than a dozen interviews were conducted with ESG program staff.

Program Participants—The key data collection effort for the M&V aspect of this project consisted site visits to a sample of participating stores to confirm measure installation. We conducted such visits to 65 sites with measures installed through the program. In addition, we conducted interviews – either on site or by telephone -- with decision makers for participating stores that installed recommended measures and received rebates in excess of $100. We also conducted telephone interviews with 30 stores that had received audits but had not installed any recommended measures as of 12/31/03 and with 21 stores (as many as we were able to contact that were willing to complete the survey) that had received rebates of less than $100 for installed measures.

Equipment Manufacturers/Distributors—Because of their depth of in-house expertise and their experience, major national manufacturers often exert considerable influence in equipment selection decisions, especially for specialized refrigeration equipment. The markets for refrigeration cases, compressors, and valves are dominated by a few manufacturers, and we interviewed a number of local manufacturers representatives of these major players to assess their perceptions of the program and its influence on the market.

Wholesalers—Several interviews were conducted with representatives of the wholesaler that was the initial focus of the ESG program. While referrals and the endorsement of this wholesaler were important to the launch of the program and its initial acceptance by the

independent grocer community, the company ultimately proved to be less critical to the ongoing success of the program.

Suppliers/Service Providers—Local refrigeration contractors (broadly defined to include firms specializing in anti sweat heater controls and companies offering door and gasket repair) were interviewed to assess their perceptions of the program and the market. While only a very limited number of contractors had an interest in the program initially, the word of mouth about ESG and the relationships established by the ESG Energy Experts helped expand the number of participating contractors substantially by the end of the first program year. In addition to refrigeration contractors, we also interviewed lighting contractors and suppliers of night covers for refrigerated cases.

Associations, Industry Experts—Much of the information we obtained from trade associations was in the form of published data, including trade publications, directories, and web sites.

Interview guides for the program staff, wholesalers, suppliers, and various categories of participants are attached in Appendix A to this report.

2.2.3 Sample Frame

The sample frame for the data collection effort is presented in Exhibit 2-3. Note that all the sites to be confirmed were also scheduled to receive an on-site survey to address process evaluation issues; in some cases, the decision makers for the verified stores were unavailable or unwilling to complete the survey. In addition, a number of decision makers were responsible for multiple stores where verification visits were conducted. As a result, the actual number of on-site interviews was less than 65. However, interviews were conducted with decision makers having responsibility for a total of 82 stores.

Exhibit 2-3
EnergySmart Grocer Program EM&V
Sample Frame

Survey type / Market Actors	Audits	On-Site	Telephone
Participants			
Installed Recommended Measures	65		
PG&E	30	30	
SCE	20	20	
SDG&E	15	15	
Installed Low/No-Cost Measures Only			30
Did Not Install			30
Wholesaler Staff			3
Manufacturers' Reps			5
Suppliers/service providers			12
Associations/observers			2
Implementation Staff			10

3. RESULTS

This section summarizes the results of the evaluation. The section begins with an analysis of program participation by size, rural/urban location, utility, and ownership structure. Next we discuss the impacts associated with the measures installed through the program, including a brief comparison to the results achieved by the Express Efficiency Program in promoting the same measures. A discussion of the effectiveness of program delivery is presented in the results of the process evaluation. Finally, results of the baseline assessment and market evaluation are presented.

3.1 PROGRAM PARTICIPATION

In addition to the overall participation data summarized in section 1, program results were analyzed by different segmentation variables. We first confirmed the fact that the program had easily exceeded its goal of 20 percent rural participation, as shown in Exhibit 3-1.

Exhibit 3-1
Summary of Program Results, by Segment

Utility	No. of Audits Completed			No. of Stores With Rebates/Retrofits		
	Total	Urban	Rural	Total	Urban	Rural
All	650	406	244	379	178	201
< 20,000	386	235	151	210	109	101
≥ 20,000	264	171	93	169	69	100
PG&E	325	184	141	191	80	111
< 20,000	216	120	96	116	55	61
≥ 20,000	109	64	45	75	25	50
SCE	225	158	67	110	51	59
< 20,000	97	64	33	39	17	22
≥ 20,000	128	94	34	71	34	37
SDG&E	100	64	36	78	47	31
< 20,000	73	51	22	55	37	18
≥ 20,000	27	13	14	23	10	13

Rural stores actually accounted for well over 20 percent of program participation, whether defined by the number of audits completed (38 percent of the total) or the number of stores undertaking retrofits and receiving rebates (55 percent). PG&E territory had the highest proportion of rural stores (43 percent), while SCE had the lowest (30 percent).

Rural stores were also much more likely to follow through on the audits, as shown in Exhibit 3-2, which presents the percentage of audited stores that received rebates. While fewer than half of urban stores that received audits had received rebates by the end of 2003, more than 80 percent of rural stores did so.

Exhibit 3-2
Percentage of Audited Stores Receiving Rebates

	% of Audited Stores With Rebates/Retrofits		
	Total	Urban	Rural
All	0.58	0.44	0.82
PG&E	0.58	0.43	0.79
SCE	0.50	0.34	0.88
SDG&E	0.76	0.70	0.86

In conclusion, it appears that the ESG program very effectively achieved its goal of reaching out to the non-urban independent grocer market, both in terms of initial outreach (the number of audits) and it terms of retrofits and measures installations. It should be noted that the definition of "rural" means that stores are located outside the Standard Metropolitan Statistical Areas (SMSAs) of San Francisco, Oakland, San Jose, Sacramento, Los Angeles, and San Diego. As such, these rural stores include many that are located in suburban areas that would not ordinarily be considered rural.

In addition to the rural/urban breakdown, we considered the distribution of stores by size, recognizing that independent grocers cover stores ranging in size from just a few thousand to more than 50,000 square feet. The results are presented in Exhibit 3-3.

Exhibit 3-3
Distribution of Audited Stores by Size

size in square feet	All	PG&E	SCE	SDG&E
	(number of stores)			
Up to 5000	189	115	38	36
5001-10,000	103	51	32	20
10001-15,000	52	32	12	8
15,001-20,000	76	28	32	16
20,001-25,000	54	22	30	2
25,001-30,000	57	27	23	7
30,001-35,000	25	12	10	3
35,001-40,000	28	13	15	0
Above 40,000	66	25	33	8
Totals	650	325	225	100

The results indicate that the ESG program was successful in reaching the smaller, hardest-to-reach segment of the independent grocer market, with approximately 45 percent of all stores audited falling into the under 10,000 square foot classification. This percentage was lower in SCE territory, perhaps because so much of this territory is suburban rather than small town or

urban. SCE also had a higher percentage of audited stores over 30,000 square feet (the definition of a supermarket used by the Food Marketing Institute). SCE had about 25 percent of audited stores over 30,000 square feet, compared to 15 percent for PG&E and 8 percent for SDG&E.

The profile of audited stores in SCE territory was also somewhat different in terms of the number of audited stores owned by different size chains, as shown in Exhibit 3-4.

Exhibit 3-4
Distribution of Audited Stores by Ownership

No. of Stores in Chain	All	PG&E	SCE	SDG&E
1	292	186	60	46
2	50	25	16	9
3-5	85	28	32	25
6-10	93	25	58	10
11-20	56	0	55	1
21-50	5	5	0	0
More than 50*	69	56	4	9

*All these stores belong to one of 5 chains

Overall, approximately 45 percent of stores audited were single locations, while 12 percent of audited stores were part of chains with 21 or more locations. Again, this highlights the extent to which the ESG program made progress with the hard-to-reach population.

In SCE territory, only 27 percent of stores were single locations, and just 2 percent were part of larger chains of 21 or more. Conversely, half of all SCE audits territory audits were in chains with 6-20 stores. This may reflect the rapid growth of medium sized chains in the SCE territory catering to the Hispanic population. For example, one of the decision makers interviewed for the evaluation was in charge of a chain that grew from 7 stores at the time of the first audit in early 2003 to 12 stores a year later.

3.2 PROGRAM IMPACTS

Since the Independent Grocer program is using Express Efficiency deemed savings for measuring energy savings, the primary emphasis of the M&V activities was on verification of installed measures and therefore program savings.

3.2.1 Confirmation of Measure Installation

In light of the deemed savings approach, the primary measurement and verification data collection effort consisted of on-site visits to participating stores where retrofits were carried out. We visited 65 stores where retrofits had been installed, selected at random from participating stores that installed at least some recommended measures. The site visits were allocated to the utility territories in approximate proportion to the number of participating stores; in addition, more than 20 percent of site visits were to stores outside urban areas, in accordance with the program's targets and the distribution of audited stores.

While the installation of most measures – particularly measures with significant impacts – was confirmed, the site visits did raise concerns regarding the installation and/or persistence of several specific measures: compact fluorescent (CFL) bulbs, Cooler Miser beverage cooler controllers, and strip curtains on walk-in coolers.

Cooler Misers.--Both Cooler Misers and CFLs were self-installed measures; that is, a contractor was not required to install the measure in order for the store to receive the rebate. For Cooler Misers in particular, the program implemented a free trial measure where the first controller was rebated in the full amount of the purchase price (not including installation.) By installing the Cooler Miser using in-house staff, stores could have the benefit of this energy saving measure at zero net cost. In a few cases, however, one or more Cooler Misers had not been installed at the time of the store visit. Since the overall impact attributable to this measure is modest, overall results would not be significantly impacted. However, we recommend that rebates for this measure be withheld until installation has been confirmed.

CFLs.--In the case of CFLs, there were many more stores where not all the rebated bulbs had been installed. Of a total of more than 500 bulbs rebated at verified stores, approximately 12 percent could not be verified; they either had not been installed or had been removed. In addition, a few failed bulbs were observed, mostly in walk-in freezers, but sometimes in conditioned space. There were also a few instances of more bulbs having been purchased than were recommended in the audit; this was apparently the result of a single store purchasing bulbs for several stores in a chain.

Problems with CFLs were observed at a number of different stores and in all three IOU service territories.

- One or two store managers suggested that employees might have taken the bulbs home; others suggested that workers might have removed the CFLs because they were dissatisfied with the quality of light. One store manager said "we took them out the day after they were installed," explaining that store staff could not read the labels on ice cream. When the walk-in cooler at this store was inspected it was found that have four 200 watt incandescent bulbs (roughly the equivalent of having a small space heater running in the freezer!).

- Whatever the reasons, the relatively high rate of attrition or non-installation for CFLs suggests that this measure should be more carefully tracked and/or that impacts should be adjusted downward. Given the substantial numbers of sites with persistence issues, we believe the impacts attributable to CFLs should be reduced by 12 percent, as discussed in section 3.2.2 below.

In part in response to the findings of the site visits, the ESG program has made CFLs a direct install measure; that is, rebates will be received only if the bulbs are installed by the ESG Energy Expert. This will ensure that all rebated bulbs are installed; however, additional monitoring will be needed to verify the persistence of this measure. One approach currently being considered is to require hard-wired compact fluorescent fixtures instead of bulbs, so that it would be much more difficult to de-install the new lighting measure.

A related issue is the expected useful life assigned to CFLs to calculate lifetime deemed savings. The calculated deemed impacts assume a useful life of 7.68 years – longer than most CFLs are likely to last in a grocery store application, since many CFLs in stores are on 12-16 hours a day, so that bulb with an expected life of 8-10,000 hours would be unlikely to last more than 2-3 years. On the other hand, the longer operating hours mean that deemed savings far understate the annual savings from CFL use, since they appear to assume fewer than 400 hours of annual operation (deemed savings for a 14-26 watt CFL are 237 kW, and a 23 watt CFL replacing a 100 watt incandescent would save .77 kWh per hour of operation). As a result, the lifetime savings attributable to CFLs would probably be greater than the deemed savings – assuming the retention issue is addressed.

Strip Curtains.--Worker resistance is a major reason for persistence issues surrounding the proper use of strip curtains on walk-in freezers and coolers. In about 5-10 percent of stores, strip curtains were found to have been tied back or otherwise disabled; in one store the middle two or three strips in a curtain had been cut away. Several managers said workers or suppliers tie the curtains back "while they do the loading," although no loading was being done at the time the tied back curtains were observed at several stores where this occurred.

While corporate decision makers (owners, energy or facility managers) generally encourage the use of strip curtains, there is often a disconnect between the attitudes of these higher level decision makers and store managers. Store managers are more interested in keeping their staff happy and improving worker productivity, and are unlikely to strongly push for proper curtain use. Several survey respondents noted, however, that they would welcome training of their staff on issues such as the importance of strip curtains.

As with CFLs, a related issue is the expected lifetime of strip curtains. The deemed savings calculations assume a useful life of 4 years, but several store managers noted that curtains become shredded, faded, or opaque within several years of installation. Additional research on the appropriate lifetime for this measure (and some others) is needed.

Other impact issues.--One additional impact issue resulting from the on-site visits was the finding that one of the stores that had received rebates for night covers was not using them. When the audit was done and the curtains were installed, the store was closed from 6-8 hours per night. During the southern California grocery strike, the store went to 24/7 operation, rendering the night covers ineffective. One of the store's owners believes the store may go back to its former schedule once the strike is settled, but that cannot be confirmed. The same owner notes, however, that the strike has dramatically increased the income of his 4-store chain, allowing them to pursue energy efficiency opportunities that otherwise would not have been realized.

3.2.2 Confirmation of Impacts and Cost-effectiveness Calculations

Once the installation of measures was confirmed, the task of confirming energy and peak demand impacts and cost-effectiveness calculations was largely one of review of calculations and methods. In addition, we sought to analyze the distribution of impacts by measure and by segment, across urban and rural and smaller and larger stores. Deemed lifetime savings for rebated measures by segment are presented in Exhibit 3-5.

Exhibit 3-5
Summary of Deemed Savings, by Segment

Utility	Deemed Lifetime Savings (kWh)		
	Total	Urban	Rural
All	283,762,659	131,889,438	151,873,221
< 20,000	116,813,978	64,609,556	52,204,422
≥ 20,000	166,948,681	67,279,881	99,668,800
PG&E	135,213,339	50,517,034	84,696,305
< 20,000	29,957,210	15,884,691	14,072,519
≥ 20,000	105,256,129	34,632,343	70,623,786
SCE	84,381,716	37,155,125	47,226,592
< 20,000	52,594,406	19,853,524	32,740,882
≥ 20,000	31,787,310	17,301,601	14,485,710
SDG&E	64,167,604	44,217,279	19,950,325
< 20,000	34,262,362	28,871,341	5,391,021
≥ 20,000	29,905,241	15,345,938	14,559,304

Note that rural stores accounted for over half of all impacts overall and in both PG&E and SCE territory, while smaller stores contributed about 40 percent of deemed savings overall, and accounted for over half the deemed savings in SCE and SDG&E territory. Both these findings further confirm the extent to which the ESG program has been successful with the hardest to reach segment of the independent grocery market.

Impacts associated with various categories of measures are presented in Exhibit 3-6. A detailed listing of measures and their associated impacts is presented in Appendix B.

It should be noted that one of the initial goals of the EM&V effort was to coordinate with the evaluation of the 2003 Express Efficiency Program; however, that evaluation had not yet been initiated as this report was prepared. We did review the results of the 2002 Express Efficiency evaluation, and found that the Express Program paid rebates of $483,000 for refrigeration measures, achieving annual deemed savings of 5 million kWh. This compares to refrigeration rebates of $1.6 million and annual deemed savings of 23.6 million kWh for the ESG program.

Exhibit 3-6
Impacts by Measure

Measure	Percentage of Deemed Savings
Lighting	**26.3%**
T8s and T5s	19.4%
Delamping	3.8%
CFLs	1.7%
Other lighting	1.4%
Coolers and Cases	**50.4%**
Low Temp Cases	21.9%
Strip curtains for walk-ins	9.0%
Anti-sweat heater controls	5.8%
Door gaskets	2.1%
Medium Temp Cases	0.7%
Other case measures	11.0%
Refrigeration Systems	**23.1%**
Multiplex compressors	11.0%
Floating head pressure control	8.3%
Efficient condenser	3.5%
Other refrigeration system	0.3%
HVAC	**0.1%**

Measures related to coolers and cases accounted for the largest share of impacts from the ESG program. This is somewhat surprising, in that lighting was originally expected to offer greater opportunities for energy savings in this segment. We believe there are two reasons for the greater relative importance of both case-related and other refrigeration measures.

- First, as discussed in the baseline analysis below, a larger proportion of stores than anticipated had already done large-scale retrofits from T-12 to T-8 lighting.
- Second, lighting retrofits were often conducted through other programs that were able to offer higher rebates than provided by the ESG program. For part of the time the ESG program was in effect, the Express Efficiency program was offering double rebates for lighting retrofits. More recently, the Small Business Energy Alliance has been offering significantly higher rebates. While the ESG program is able to take credit for the retrofit when lighting retrofits suggested by the ESG audit are done through the SBEA program, the associated savings cannot be counted.

If anything, case and refrigeration measures may become more important over time. Unlike lighting retrofits, which can be done fairly quickly, new cases, multiplex compressor systems, and other big-ticket items have a longer sales and decision cycle. As the program continues, it is likely that more stores who had these measures identified in their audit months ago will follow through with installations.

3.2.3 Impact Adjustments

The only measures for which we would propose to make adjustments to the deemed savings are those involving screw-in CFLs. As noted previously, approximately 12 percent of rebated CFLs in audited stores could not be confirmed, so we are recommending that impacts from these measures be reduced by 12 percent: from 4.9 million kWh to 4.3 million kWh. In addition, the fact that some fixtures appear to have been removed raised concerns about the future persistence of savings from this measure. We therefore also propose that a sample of stores be inspected one year after the initial CFL installation to assess the persistence of this measure.

While we do not recommend a current adjustment to the lifetime savings attributed to strip curtains, we believe this measure, too, should be monitored over time to investigate both the continued functionality of the curtains(i.e., whether they are kept in place and whether their condition supports their intended function) and their usage (i.e., whether they are being used as intended rather then being regularly tied back or otherwise disabled).

Follow-up verification is also recommended for the following measures:

- Case and walk-in door gaskets – to ensure that their condition is maintained for the deemed 3.8 year lifetime
- Floating head pressure control – to ensure that systems settings are such that head pressure is truly allowed to float so that savings can be achieved
- Anti-sweat heater controls – to confirm that heaters are in fact continuing to be cycled and that appropriate set points are maintained

As discussed above, the Energy Smart Grocer program also used the baseline data from the GrocerSmart© audit tool to develop grocery-store specific deemed savings to better understand the program's actual energy savings. In this case, Quantum reviewed this methodology; the audit findings are generally substantially higher than the deemed savings provided by the Express Efficiency program. For a sample of lighting retrofits through the ESG program, annual kWh savings of 606,659 kWh were calculated using the audit tool (and based on actual operating hours), while annual deemed savings were only 168,919 kWh. These higher impacts appear to be justified according to the engineering analysis driving the audit calculations and, especially, by the longer operating hours and higher operating factors typical of grocery store lighting. Our analysis did not include a detailed investigation of the appropriateness of using these higher alternate impacts for the ESG program; it is assumed that the current, ongoing DEER study will address the further refinement of refrigeration impacts.

3.3 PROCESS EVALUATION

The CPUC requirement that the EM&V provide ongoing feedback regarding the effectiveness of program implementation corresponds directly to the standard goals of a process evaluation. For this program, input to the process evaluation was conducted through document review, interviews with program staff and subcontractors, program participants, and other market actors involved in the program. This enabled us to determine whether the program is being

delivered in an effective and timely manner, is reaching its target market, and is engaging other market actors who could influence the sustainability of observed changes in the market.

The goal of the process evaluation activities was to provide PECI with early feedback that could be used to make timely adjustments in program design or delivery. Important findings were passed along to PECI in phone calls and documented in memos to ensure that maximum benefit could be derived from the EM&V activities.

A number of process evaluation issues were addressed as a result of the first round of interviews with ESG program staff and vendors in the summer of 2003. Basically, the analysis of program design and implementation at that time found a program that was well received by independent grocers, by the major wholesaler targeted by the program, and by the limited number of vendors cooperating to date. Other findings from the initial analysis include:

- All of those interviewed were satisfied with the ESG program's progress to date, but said that they believed additional time (beyond the original end of 2003 ending date) would be needed for the program to capitalize on the gains made thus far and move the market toward transformation.

- Audit results, as well as comments from vendors interviewed, indicated that there are ample opportunities for quick-payback low cost measures (such as night covers, strip curtains, gasket and automatic closer repairs, anti-sweat heater controls), intermediate measures such as lighting retrofits, and longer term improvements to cases and compressor systems.

- The ESG program appears to be targeting independent grocers at an opportune time. While independents are never going to have deep pockets and unlimited access to capital, they are currently doing well in the California market.

Challenges identified for the program by the initial analysis included:

- Continuing difficulties in getting vendors to respond to smaller, more remote stores

- Limited promotion of the program by Unified Western Grocers

- The need to jump-start the process by which stores receive audits, identify opportunities, and implement energy efficiency measures

- The need to walk a fine line between streamlining the participation process and not promoting specific vendors to the exclusion of others.

The full memo is attached to this report as Appendix C.

A second round of interviews and field observations confirmed the earlier findings regarding the efficacy of program delivery and the critical role played by the ESG Energy Experts. In addition, several issues raised earlier remained. For example, there were still instances of store decision makers "never hearing back" from contractors or other vendors. In most cases these were smaller stores, and in several instances a follow-up call from the EE brought a quick response from the vendor. While it is true that some vendors have not followed up as

effectively as they might, some grocers have also been remiss in simply waiting for vendors to initiate follow-up. On the other hand, there were also a number of examples of stores having followed up with additional measures.

As the program has evolved, so has the role of the Energy Experts; they have become key players both in the delivery of the program and in the development of relationships between independent grocers and vendors who deliver energy efficiency measures. In fact, the Energy Experts have in some ways supplanted the role originally envisioned for the wholesaler.

Store managers, owners, and other decision makers encountered during the on-site visits continued to express a high degree of satisfaction with the ESG program in general and the Energy Experts in particular. To quantify these impressions, specific aspects of respondent satisfaction were investigated using the results of on-site and telephone surveys. First, respondent were asked to rate the quality of various aspects of the ESG program. Results of the analysis of responses to this question are presented in Exhibit 3-7.

Exhibit 3-7
Respondent Rating of Program Elements

	Rebates > $100	Rebates ≤ $100	No Rebates
	(mean ratings)*		
Quality of the store audit	5.6	5.6	5.2
Quality of the recommendations	5.8	5.4	5.1
Technical knowledge of the program staff	5.8	5.2	5.0
Responsiveness of the program staff	5.7	5.4	5.0
The specific measures covered by the program	5.4	5.4	4.9
Paperwork and procedures required to receive incentives	5.7	4.9	4.7
Quality of vendors who provide the recommended equipment/services	5.4	5.5	5.0
Assistance with contractors	5.4	4.9	4.8
Quality of O&M advice provided by Energy Expert	5.6	5.3	5.1

*Respondents were asked to rate each attribute on a 1 to 6 scale, where 1 is very poor and 6 is excellent

The most striking result is the consistently high ratings given to the quality of the store audit, the recommendations, and the ESG Energy Experts. The Energy Experts received high marks for their technical knowledge, responsiveness, and the quality of the operations and maintenance advice they provided. Interestingly, ratings for these program elements seemed to be in direct proportion to the extent of the respondent's involvement with the Energy Expert; that is, those with the higher rebates had higher mean ratings than those with rebates less than $100, who in turn had higher mean ratings than those that did not install any of the recommended measures.

It is also worth noting that grocers who received the highest rebates assigned the highest ratings to the ease of paperwork and procedures required to receive those rebates and to the assistance received in dealing with contractors. (Clearly one would expect lower rating for assistance with contractors from stores who had no opportunity to take advantage of that assistance.) It may be that grocers who did not install measures through the program assigned lower ratings to paperwork and procedures because they exaggerate the difficulty of obtaining rebates; if so, it is

worth reminding the Energy Experts of the need to emphasize how easy it is to receive rebates through the ESG program.

Respondents were also asked what aspects of the program they found most and least helpful. Over half of respondents noted the helpfulness of the ESG Energy Expert; this was true/not true for respondents who installed significant measures and those who did not install any measures. Very few store owners/decision makers were able to offer aspects of the program they found least helpful, with many offering favorable comments on the quality of the audit, the value of the services provided by the Energy Expert, and the program overall. The few comments that were received focused on the difficulty of getting vendors to follow up. This was a particular problem for smaller stores, particularly those located away from urban areas. The travel cost associated with visiting a store and developing a bid make some small jobs uneconomical. However, a number of vendors have made and demonstrated a commitment to follow up even with small stores, although sometimes this means waiting until a number of stores can be combined into one trip.

About the only response offered to the question asking for suggestions for program improvement consisted of store owners asking for more or larger rebates, and a few decision makers who said they would like to see more follow-up from vendors.

In addition, respondents were asked to rate the value of various program elements in helping them overcome barriers to the installation of energy efficient equipment in their stores (see Exhibit 3-8).

Exhibit 3-8
Perceived Value of Program Elements

	Rebates > $100	Rebates < $100	No Rebates
	(mean ratings)*		
Audits	5.7	5.1	5.2
Technical assistance	5.0	5.2	5.1
Contractor referrals	4.6	5.0	4.5
Project management assistance	4.5	4.8	4.5
Informational brochures	4.0	5.2	4.7
Demonstration stores	4.2	4.6	4.6
Rebates/incentives	5.3	5.7	5.5
Web-based information	3.3	4.4	3.8
Training for staff	4.3	4.6	4.6
Financing	3.8	4.3	4.2

* Respondents were asked: On a scale of 1 to 6, where 1 is not at all helpful and 6 is very helpful, how helpful would you find each of the following in promoting energy efficient equipment at your stores

Consistent with the ratings of ESG program elements analyzed above, respondents gave high ratings to the value of audits, technical assistance, and rebates and incentives. Note that stores receiving more than $100 in incentives had the highest mean rating for the perceived value of the audits; on the other hand, those same stores placed slightly less emphasis on the value of rebates and incentives.

Project management assistance and contractor referrals both received relatively high ratings from all groups, indicating the extent to which these respondents still recognize their own need for help in implementing energy efficiency measures. One of the defining elements (and strengths) of the ESG program is the level of such assistance it provides the store owner or decision maker, and this appears to be appreciated by the program's target market.

While the mean ratings for staff training is relatively low, the mean value appears to reflect a bimodal distribution, with respondents providing either a very high or low rating. Those who provided a 5 or 6 rating were asked what kind of training they would find most helpful; responses generally emphasized overall awareness of energy efficiency as well as specific actions that employees should take to help reduce store energy usage (e.g., closing freezer doors, not interfering with the operation of strip curtains, using night covers when appropriate.) Several decision makers and store managers commented favorably on the desirability of such training.

Another program element seen as relatively effective included demonstration stores where decision makers can see featured technologies in action. Some store owners reported that they informally make such visits already when they hear that another store has a particular technology or measure installed. Where there is a need to highlight a new, relatively unknown technology, it may be appropriate to use demonstration stores and have Unified Western Grocers disseminate information about them to its other members.

Among the less highly regarded program elements were financing (most installations appear to be internally financed) and web-based information (store decision makers say they are extremely busy and do not have the time to review large volumes of information).

3.4 MARKET BASELINE AND MARKET EVALUATION

The comprehensive retailer database created by the ESG Program includes existing lighting, HVAC and refrigeration equipment, operating hours, proposed measures, selected measures, rebate, and contractor information. This Access database developed for all targeted independent groceries provided an excellent baseline. To render the development of a "typical" baseline store more manageable, two prototype stores were developed from the database. Audit results from ten stores in the under-15,000 square foot range were averaged to represent a typical smaller store, while audit results from ten stores in the over-30,000 square foot range were averaged to develop a prototypical larger independent supermarket. Results of these exercises are presented in Exhibit 3-9.

Exhibit 3-9
Baseline Characteristics of Smaller and Larger Stores

Average Numbers for 10 audits:	Size Ranges <15000 sq. ft.	>30000 sq. ft.
Lighting*		
Square footage - total store	10,470	42,900
Number of 4' T12 fixtures	18	59
Number of 8' T12 fixtures	32	92
Number of 4' T8 fixtures	1	96
Number of 8' T8 fixtures	11	17
Other standard fluorescent fixtures	21	0
Other EE fluorescent fixtures	0	0
Number of incandescent bulbs	5	4
Number Halogen, HPS bulbs	0	1
Number of other lighting fixtures	2	0
Cases		
Low Temp	**47**	**251**
Feet of Low Temp Upright cases closed (high efficiency)	0	26
Feet of Low Temp Upright cases closed (standard eff)	46	117
Feet of Low Temp Upright cases - open (standard & high eff)	1	36
Feet of Low Temp coffin cases	0	72
Med Temp	**164**	**489**
Feet of Medium Temp Upright cases - open - standard (incl. meat & deli)	112	391
Feet of Medium Temp Upright cases - open - high efficiency	0	0
Feet of Medium Temp Upright cases - closed - standard (incl. meat & deli)	48	72
Feet of Medium Temp Upright cases - closed - high efficiency	0	0
Feet of Med Temp coffin cases	4	26
Other Case-related Statistics		
Percentage open case feet with night covers	21%	17%
Percentage of gaskets requiring replacement	25%	40%
Percentage of walk in doors with gaskets requiring replacement	44%	42%
Square feet of low temp walk ins	145	715
Square feet of medium temp walk ins	123	2345
Avg Square feet of strip curtain (assume 7' tall doors)	41	558
Percent of walk-in door space with strip curtains	38%	27%
Number of vending machines/beverage merchandisers	1	1
Refrigeration System		
Percentage with multiplex systems	30%	80%
Percentage with floating head pressure control	0	0%
Percentage of stores with ASH controls	0	0%

* 3 Large stores (30%) had not done a T8 retrofit on their sales floor
3 Small stores (30%) had not done a T8 retrofit on their sales floor

One of the most striking findings is the relatively high penetration of T8 lighting in these stores, with 70 percent of both large and small stores already having done retrofits of their sales floor

lighting. This result confirms the earlier finding by EEs that there were relatively few opportunities for lighting retrofits because the penetration of T8s was already rather high.

On the other hand, note that there are ample opportunities in refrigeration. On average, the baseline stores had strip curtains on less than 40 percent of walk-in space; about 40 percent of walk-in doors and 25-40 percent of case doors had gaskets requiring replacement; and less than one-fourth of open cases had night covers. In addition, fewer than 10 percent of low-temp cases in large stores and none in small stores were high efficiency models cases, and none of these 20 stores had the ability to effectively cycle their anti-sweat heaters. Finally, none of the stores were operating multiplex compressor racks with floating head pressure control.

These baseline data will be compared to the measures installed in stores when audits are conducted over the next several years; both in stores that are being audited for the first time and in stores that are undergoing a second audit after measures have been installed.

A second set of baseline data is provided by the responses to questions regarding perceived barriers to energy efficiency among store decision makers. These results are summarized in Exhibit 3-10 for three categories of stores: those that received rebates of $100 or more, those that received rebates of less than $100, and those that did not receive any rebates. Stores receiving rebates of less than $100 generally installed only compact fluorescent lamps (CFLs), although a few also received single installations of Cooler Miser beverage case controllers (which had a $90 rebate).

Exhibit 3-10
Perceived Importance of Barriers to Energy Efficiency

Barriers	Rebates > $100	Rebates ≤ $100	No Rebates
	(mean ratings)*		
It's difficult to find reliable, unbiased estimates of potential energy savings	3.7	4.9	4.5
Energy efficient equipment doesn't meet our payback requirements	3.7	4.8	4.6
Decisions are made at headquarters; energy efficiency is not a major concern to them	1.9	4.4	4.4
Doors would inhibit customers from reaching into cases	3.2	3.8	4.1
It is difficult to get financing for improvements	2.1	3.8	3.8
It is difficult to get trustworthy technical advice or product specifications	3.3	4.0	4.3
I'm concerned about energy, but other priorities take precedence	4.0	4.2	3.9

* Respondents were asked to rate the importance of each of these problems when considering energy efficient equipment, using a 1 to 6 scale, where 1 is not at all important and 6 is very important

Stores receiving rebates of more than $100 consistently had lower perceived barriers than the other two groups. While the relatively small sample sizes limit the statistical reliability of these results, they tend to support the fact that there are differences in how these groups face the decision to install energy efficiency measures. While it is difficult to establish a direct cause and effect relationship between more extensive involvement in the ESG program and the reduction in barriers, it seems reasonable to assume that at least some of the differences between these groups are due to the fact that stores receiving rebates have overcome barriers they might have perceived earlier. For example, stores receiving larger rebates had lower concerns about the difficulty of finding reliable estimates of energy savings or trustworthy technical advice, about financing improvements, or about being unable to meet payback requirements – all of which could have been the result of successfully going through the retrofit process. To that extent, we would argue that the ESG program has had the effect of lowering barriers to energy efficiency among program participants.

Another characteristic that may set large rebate stores apart from the other groups is their ability to act independently to move forward. For the statement regarding decisions being made at headquarters, the no-rebate and small-rebate groups had mean ratings more than twice as high as the large rebate stores.

Note that there are very few differences between the responses of those who received small rebates and those who received no rebates. As noted previously, the low-rebate installations generally involved less interaction with the ESG Energy Expert and no interaction with product vendors, so that those who received small rebates had little more interaction with the program than those who received no rebates. It therefore appears that the process of working with the EE and with contractors to implement a retrofit has the effect of overcoming market barriers. This suggest that information from store audits alone is not enough to motivate many of these store decision makers; all those program elements identified earlier – such as technical support, assistance working with contractors – seem to be critical elements in transforming this market.

In addition to baseline issues, the market evaluation analyzed sources of program awareness and decision making among program participants. Sources of program awareness for each category of stores are shown in Exhibit 3-11.

Exhibit 3-11
Source of Program Awareness

Source of Awareness	Rebates > $100	Rebates < $100	No Rebates
	(percent)		
ESG Energy Expert	43.2	24.1	33.3
Unified Western Grocers	27.0	20.7	
Vendor	18.9	10.3	5.6
Friend/colleague	8.1	6.9	5.6
ESG direct mail or phone call	2.7	31.0	44.4
Other*		6.9	11.1

* Other included internet, flyer, trade magazine

The ESG Energy Experts were cited most often as the source of program awareness among stores that received rebates in excess of $100, while other ESG contacts, both direct mail and phone calls, were most often mentioned by the other two groups of store decision makers. It is not clear whether the fact that program awareness came from the Energy Expert or through Unified Western Grocers helps explain why these stores installed more measures; it may be that the population of stores that received larger rebates were those that have had the most time to act on the audit recommendations. That would mean they were among the stores contacted relatively early in the program implementation cycle, when the EEs initiated contact directly and when Unified Western Grocers did some initial mailings to introduce the ESG program to the market. Conversely, the stores with fewer or no measures installed to date may have been contacted later, after the ESG program began direct telemarketing to schedule appointments. A number of these stores may install more of the recommended measures at a later date. Subsequent actions by these stores should be tracked in the future.

Reasons for program participation were also investigated, using survey results presented in Exhibit 3-12.

Exhibit 3-12
Most Important Reason for Participation in ESG Program

Most Important Reason	Rebates >$100	Rebates <$100	No Rebates
	(percent of respondents)		
Save energy	6.1	11.1	17.1
To reduce costs/save on utility bills	72.7	61.1	62.9
Take advantage of the rebates	15.2	0.0	5.7
Recommended by a colleague/boss	0.0	5.6	0.0
Other reasons*	6.1	22.2	14.3

Other reasons offered included: "to make sure we get the right things into the store", "able to get new rather than refurbished case", "be environmentally responsible," "invest extra profits", and "we knew we needed to do some things, but several energy consulting companies wanted to charge us an arm and a leg"

Overwhelmingly, stores in all categories said they participated in the ESG program to save energy or reduce their utility bills. Relatively few respondents said they participated primarily to take advantage of the rebate. Respondents appear to recognize the growing importance of energy efficiency, with over half saying their energy bills have increased over the past 2-3 years, as shown in exhibit 3-13.

Exhibit 3-13
Perception of Energy Costs over Past 2-3 Years

Over the past 2-3 years, have your energy costs increased, decreased, or remained about the same?	Rebates > $100	Rebates ≤ $100	No Rebates
	(percent of respondents)		
increased	62.5	46.2	57.7
decreased	18.8	15.4	19.2
about the same	18.8	38.5	23.1

A higher percentage of respondents with higher rebates perceives that their energy costs have gone up over the past two years – which may help explain why they were motivated to take action. High-rebate respondents were also somewhat more likely to have longer payback criteria on energy efficiency investments, as shown in Exhibit 3-14.

Exhibit 3-14
Payback Criteria for Energy Efficiency Measures

What is your payback criterion for installing energy efficiency measures?	Rebates > $100	Rebates ≤ $100	No Rebates
	(percent of respondents)		
Don't know/don't have one/depends	28.1	14.3	29.2
1 year or less	31.3	21.4	16.7
2 years or less	3.1	7.1	16.7
3 years or less	15.6	50.0	20.8
over 3 years	21.9	7.1	16.7

That a significant percentage of respondents in all categories was unable to provide an estimate of their payback requirement for energy efficiency suggests that additional education may be appropriate to assist these decision makers in conducting life cycle cost analyses. On balance, however, respondents seem to see the need for greater energy efficiency, with almost 90 percent saying they expect the percentage of high efficiency equipment in their stores to increase over the next 3-5 years. On the other hand, only about one-third of respondents said they would be very likely to undertake additional energy efficiency actions if the ESG program were no longer available.

4. CONCLUSIONS AND RECOMMENDATIONS

Overall, the Energy Smart Grocer program has been very successful in moving a traditionally underserved market segment toward greater energy efficiency through a carefully designed mix of program elements and a highly responsive adaptive management strategy. Both the results achieved to date and the high degree of satisfaction expressed by respondents regarding the program overall as well as various program elements indicate that the ESG program strategies are working.

To streamline the participation process, the ESG has made numerous mid-course corrections that have made the program more user friendly for stores as well as vendors. As a result, the number of vendors offering qualifying measures to independent grocers has grown significantly since the start of the program. In addition, several of the major case manufacturers (e.g., Hussman, Tyler) have begun to build their cases for the California market to the specifications of the ESG program.

Several new technologies that offer increased energy efficiency to independent grocers have been introduced to and accepted by the market:

- Cooler Miser offers a low-cost solution to reducing energy usage of beverage coolers
- Door Miser provides a cost-effective means of sharply reducing the cost of anti-sweat heaters on low temperature cases
- Several vendors specializing in the repair and replacement of door gaskets have begun to offer their services to independent grocers, usually at a far lower cost than other contractors affiliated with the major manufacturers.
- Floating head pressure controls, which were not present in any of the baseline stores, are gaining acceptance among growing numbers of stores

There is also evidence that program participation appears to reduce the level of barriers perceived by store owners; the more extensively they are involved with the program, the lower their perception of barriers.

One assumption underlying the original program design does not appear to have been true--at least not to the extent anticipated. It was thought that representatives of Unified and other wholesalers could play a major role by integrating the ESG program offerings with the services they already provide to their member stores. In fact, the wholesalers appear to play only a minor part in influencing the energy efficiency decisions of their member stores.

The role originally hypothesized to be played by the representative of the major wholesalers is in fact being filled by representative of the ESG program. The Energy Experts have become key players in the delivery of energy efficiency awareness and services to the California independent grocer sector. They are trusted by store owners as a source of unbiased information from a disinterested party, and by vendors as players who have the ear and the respect of the owner.

We believe the GrocerSmart© audit tool and the output it produces have contributed to the credibility of the Energy Experts; store owners repeatedly cited the high quality of both the findings and the format in helping to educate and empower them with regard to energy efficiency.

While almost all the major measures installed were verified during the on-site visits, persistence issues surround several measures, primarily CFLs and to a lesser degree Cooler Misers and strip curtains. We recommend that rebates on the CFLs and Cooler Misers be contingent on verification that the measure has been installed; we also propose that follow-up visits be conducted in the future to assess the extent to which all three of these measures are operating as intended.

APPENDIX A

INTERVIEW GUIDES

Interview Guide – Suppliers

PECI ENERGY SMART GROCER EVALUATION

Company Name: _____
Contact Name: _____
Contact Title: _____
Phone Number: _____
Address: _____
Date: _____
Interviewer _____

Hello. I'm calling from Quantum Consulting on behalf of the California Public Utilities Commission for an evaluation of the EnergySmart Grocer program. (IF NECESSARY: The EnergySmart Grocer program is an energy efficiency program offered to independent grocery stores by PECI. Our records show that your company is one of the suppliers offering products or services to stores that are participating in the program.) As part of this study, we are interviewing selected contractors who provide services to the independent grocers who are targeted by the program. Does this description apply to your organization?

NO : Thank and terminate

YES: Are you the right person to answer questions regarding trends in equipment usage, maintenance, and selection in independent grocery stores in California? (If NO) Who would be the best person to talk to?

Other Contact Name: _____
Other Contact Title: _____
Phone Number: _____

Do you have about 15 minutes to complete this interview? (If not, schedule a callback.)

Q18. What percentage of your company's business in California is accounted for by:
chain supermarkets? _____ (%) independent supermarkets? _____(%)
chain C-stores? _____(%) independent C-stores _____(%)
other _____(%)

Q20. What services does your company provide to food stores?
a. Equipment sales
b. design and planning
c. installation
d. scheduled maintenance
e. repairs
f. financing
g. other (1) _____
h. other (2) _____

Q25. About how would you break down the work you do for food stores between existing stores and new stores or major expansions?

Existing stores _____(%) New stores or expansions _____(%)

Next I would like to ask you about the EnergySmart Grocer Program.

Q30. How did you find out about the program?

Q35. What percentage of your business since you began participating in the program has been done through the program?

Q40. Since you began participating in the EnergySmart Grocer Program, to what extent have you increased your sale of energy efficient products or technologies to stores that are not participating in the program?

Q45. Since you began participating in the EnergySmart Grocer Program, how have you changed the types of products that you stock or that you offer to customers?

Q50. Since you began participating in the EnergySmart Grocer Program, to what extent have you developed new contacts with stores, wholesalers, or equipment manufacturers?

Q55. I'm going to ask you to rate various aspects of the EnergySmart Grocer program, using a 1 to 6 scale where 1 is very poor and 6 is excellent (ROTATE).

a. Program promotional materials
b. Quality of the store audit
c. Quality of the recommendations
d. Technical knowledge of the program staff
e. Responsiveness of the program staff
f. The specific measures covered by the program
g. The level of incentives provided by the program
h. Paperwork and procedures required to receive incentives

Q60. What aspects of the program have you found most helpful to your business? Why do you say that?

Q65. What aspects of the program have you found least helpful to your business? Why do you say that?

Q70. What aspects of the program would you change?

Energy Efficiency Installation Trends

Now, I would like to ask a few questions regarding installation of energy efficient equipment/lighting in food stores

Q116. Relative to your overall sales to the retail food sector, what percentage was accounted for by high efficiency lighting/refrigeration/HVAC equipment in 2002?

Q116a. _____2002 High Efficiency Q116b. _____2002 Standard Efficiency

Q117. Of those jobs that involved high efficiency equipment, approximately what percentage involved a utility rebate, incentive, or financing?

Q305. Thinking about your sales approach to food store customers over the past 2-3 years, has your emphasis on controlling, managing, or reducing energy demand increased, decreased, or remained the same?

Q306 What have been the reasons behind those changes?

Q306 What specific energy efficient features/technologies are you currently emphasizing in the retail food sector?

Q312a. What are the major barriers you face in selling/installing high efficiency (refrigeration/HVAC/lighting) equipment today?

Q314. To what extent has the EnergySmart Grocer Program reduced those barriers?

Q315. How likely are companies that have participated in the EnergySmart Grocer program with one store to participate in the program at other stores?

a. Very unlikely _____
b. Somewhat likely _____
c. Very likely _____

Q316. (IF VERY UNLIKELY) Why are they unlikely to do so?

Q317. How likely is it that companies that have participated in the program with one store will undertake additional energy efficiency actions at other stores if the EnergySmart Grocer program is not available to them?

d. Very unlikely _____
e. Somewhat likely _____
f. Very likely _____

LIGHTING CONTRACTORS ONLY

Q318. Among the food stores that you service, approximately what percentage have each of the following technologies in place:

Equipment Type	**% of New Stores with Equipment**	**% of Existing Stores with Equipment**
HID exterior lighting		
Any other aspects of store design to minimize/manage energy use?____ _		

HVAC CONTRACTORS ONLY

Q320. Among the food stores that you service, approximately what percentage have each of the following in place:

Equipment Type	**% of New Stores with Equipment**	**% of Existing Stores with Equipment**
Tier 1 Efficiency A/C Units		
Tier 2 Efficiency A/C Units		
Tier 3Efficiency A/C Units		

Any other aspects of store design to minimize/manage energy use?____ _		

REFRIGERATION CONTRACTORS ONLY

Q321. What kind of evaporator fan motors do you keep in stock:

1. Shaded pole motors
2. Permanent split capacitor motors
3. Electronically commutated motors (ECMs)

Q321a. Why do you not stock PSC or ECM motors?

Q322. Have you observed any differences in the overall approach to the repair or replacement of refrigeration equipment/systems among independent stores compared to the larger chains? What are those differences?

Q323. Among the food stores that you service, approximately what percentage have each of the following technologies in place:

Equipment Type	**% of Stores with Equipment**
Energy Management Systems	
Floating head pressure controls	
High efficiency compressors	
Multiplexed compressors	
Night covers for refrigerated cases	
Permanent Split Capacitor (PSC) evaporator fan motors	
Electronically commutated (ECM) evaporator fan motors	
"Smart" defrosting using sensors to trigger defrost cycle	
What percent of freezer (low temperature) cases have doors?	

What percent of (medium temperature) refrigerated cases have doors?	
What percent of case doors are low/no heat?	
Any other aspects of store design to minimize/manage energy use?____ _____	

IMPORTANCE OF ENERGY USAGE (ALL)

Q410. What payback do your retail food customers typically look for in an energy efficiency investment? _____ (years).

Q411. Does this differ for supermarkets chains (Q213)_____and independent grocers (Q214)_____?

Q420. Do you have any other observations regarding the potential for greater energy efficiency in the retail food sector?

Those are all the questions I have for you today. Thank you very much for your time.

ENERGYSMART GROCER IMPLEMENTATION STAFF INTERVIEW GUIDE

PROJECT ROLE

Please describe about your role with the EnergySmart Grocer Program:

- When did you start working on the program?
- What is your title?
- What are your responsibilities? Have those changed since the beginning of the project?
- How do you interact with the various other players?
    - PECI project managers
    - Wholesaler staff
    - Store corporate staff
    - Individual store staff
    - Manufacturers and reps
    - Contractors

PROJECT PROCEDURES AND DOCUMENTATION

1. How do stores typically find out about the program?
2. When do you become involved in the participation process?
3. Please describe the steps involved in program participation and the lengths of time involved.
    - Initial contact
    - Scheduling and conducting audit
    - Decision on implementing recommendations
    - Selection of vendors
    - Installation of measures

4. How are contacts with stores tracked? How often do you follow up? How frequently do store decision makers change their mind about participating?

PROCESS EVALUATION

5. Discuss the flow of information from the program to the customer, including initial marketing materials, contracts and other paperwork, technical information, follow-up assistance

6. Discuss project coordination, communication and tracking systems/documentation, focusing on interaction between:
   - PECI program staff and field personnel
   - Program staff, wholesaler staff, and stores
   - Program staff and vendors (both manufacturers and contractors)
7. What problems/issues have come up in the implementation of the program and how have those been addressed?

8. What changes have been made from the initial implementation plan and why? What has been the effect of those changes?

9. Are there other changes in processes and procedures that would improve the delivery of the program? What are they and how should those be implemented?

10. What have been the effects – both positive and negative -- of other utility or CPUC-sponsored programs on the EnergySmart Grocer program? How might positive effects be encouraged and negative effects mitigated?

MARKET EVALUATION/ASSESSMENT

11. What have you found to be the main barrier to participation in the program?

12. What are some of the reasons that stores:
   - Decline the audit
   - Install only low/no cost measures
   - Do not install all the recommended measures
13. Do you see any consistent characteristics among stores that are not interested in participating compared to those that do participate?

14. To what extent are the levels of technology (ie, market penetration of existing energy efficiency measures) what you had expected to find?

15. Discuss changes in the relationship between wholesalers, manufacturers, contractors, and customers that may have resulted from the program. Which players have been most affected by the program; that is, for which groups have barriers to energy efficient technologies been most clearly diminished, and how?

16. Do you see any evidence that energy efficiency measures are being installed outside the program (for example out of state, in areas not served by IOUs)?

17. What do you see as the most significant changes in the market that have resulted from the program thus far? Are there others that might be observed after more time has passed? What barriers to energy efficiency do you see as most significant on both the demand and supply side of the market?

18. If the program were no longer available, what would be the response of stores? Of manufacturers? Of contractors? To what extent do you think the wholesalers might step in to offer some of the services currently provided by the program?

EnergySmart Grocer Wholesaler Interview Guide

PROJECT ROLE

1. Please describe about your role with the EnergySmart Grocer Program:
   - What is your title?
   - What are your responsibilities with regard to the program?
   - How do Unified's activities on the program mesh with other services that you provide to stores?
   - How do you interact with the various other players?
   - PECI project managers
   - Implementation staff
   - Store corporate staff
   - Individual store staff
   - Manufacturers and reps
   - Contractors

PROJECT PROCEDURES AND DOCUMENTATION

2. How do stores typically find out about the program? Do you actively encourage the stores you serve to participate in the program?
3. Please describe your role in the participation process with regard to:
   - Initial contact between the program and the stores
   - Scheduling and conducting audit
   - Decision on implementing recommendations
   - Selection of vendors
   - Installation of measures
4. To what extent do you follow up with participants? How frequently do store decision makers change their mind about participating?

PROCESS EVALUATION

5. Discuss your perceptions of project coordination, communication and tracking systems/documentation, focusing on interaction between:
   - Unified staff and field personnel
   - Unified staff, program management, and stores
   - Unified staff and vendors (both manufacturers and contractors)
6. What problems/issues have come up in the implementation of the program and how have those been addressed?

7. What changes have been made from the initial implementation plan and why? What has been the effect of those changes?
8. Are there other changes in processes and procedures that would improve the delivery of the program? What are they and how should those be implemented?
9. What have been the effects – both positive and negative -- of other utility or CPUC-sponsored programs on the EnergySmart Grocer program? How might positive effects be encouraged and negative effects mitigated?

MARKET EVALUATION/ASSESSMENT

10. What have you found to be the main barrier to participation in the program?
11. What are some of the reasons that stores:
    - Decline the audit
    - Install only low/no cost measures
    - Do not install all the recommended measures
12. Do you see any consistent characteristics among stores that are not interested in participating compared to those that do participate?
13. To what extent are the levels of technology (ie, market penetration of existing energy efficiency measures) what you had expected to find?
14. Discuss changes in the relationship between your organization, manufacturers, contractors, and customers that may have resulted from the program. Which players have been most affected by the program; that is, for which groups have barriers to energy efficient technologies been most clearly diminished, and how?
15. Do you see any evidence that energy efficiency measures are being installed outside the program (for example out of state, in areas not served by IOUs)?
16. What do you see as the most significant changes in the market that have resulted from the program thus far? Are there others that might be observed after more time has passed? What barriers to energy efficiency do you see as most significant on both the demand and supply side of the market?
17. If the program were no longer available, what would be the response of stores? Of manufacturers? Of contractors? To what extent do you think your company might step in to offer some of the services currently provided by the program?

Interview Guide – Participants

PECI ENERGY SMART GROCER EVALUATION

In addition to verifying measure installation, we are interviewing participants in the program. The information we collect will help improve the program so that it continues to meet the needs of independent food stores. Do you have about 10 minutes to complete this interview? (If not, schedule a **firm** callback.)

Q12. How many stores do you/does your company operate in California?_____

Q16. How many of those stores are your responsibility as far as making energy related purchases and investment decisions? _____

Energy/Electricity Usage

Q111. Over the past 2-3 years, have your energy costs increased, decreased, or remained about the same?

1. Increased 2. Decreased 3. Stayed about the Same

EnergySmart Grocer Program.

Q30. How did you find out about the EnergySmart Grocer program? _____

a. EnergySmart Grocer Energy Expert (Gary Clifford, Larry Thomas, Andy Chandler, Chetan Kadakia, Cesar Robelo, Lawrence Paulsen)
b. Through Unified Western Grocers
c. From a vendor/contractor/manufacturer
d. Direct mail
e. Telephone call from ESG scheduler
f. Heard from a friend/colleague
g. Other _____

Q35. What were your main reasons for participating in the program? (DO NOT READ, CHECK ALL THAT APPLY)

a. To save energy
b. To reduce costs/save on utility bills
c. To take advantage of the rebates
d. To get access to unbiased technical information/assistance
e. To get a better understanding of our energy use
f. Recommended by a colleague/boss
g. Recommended by a vendor/supplier
h. Other (specify) _____

Q40. IF MORE THAN ONE: Which of those was the most important reason? (Circle)

Q42. What motivated you to install some recommended measures but not others?

_____

_____

Q44. What other recommended measures on the audit do you plan to install in the future?

_____

_____

Q45. What other recommended measures do you not plan to install and why? (Probe for capital cost, payback, complexity)

_____

_____

Q47. What is your payback criterion for installing energy efficiency measures? _____

Q49. Is this the same as or different than the payback criterion you use for other investments in your store?_____ (If different: Why is that?) _____

Q50. What aspects of the program have you found most helpful? Why do you say that?

_____

_____

Q55. What aspects of the program have you found least helpful? Why do you say that?

_____

_____

Q60. Now I would like you to rate various aspects of the EnergySmart Grocer program, using a 1 to 6 scale where 1 is very poor and 6 is excellent. (ROTATE) If 1 or 2, why do you say that.

i.	Quality of the store audit	_____
j.	Quality of the recommendations	_____
k.	Technical knowledge of the program staff	_____
l.	Responsiveness of the program staff	_____
m.	The specific measures covered by the program	_____
n.	Paperwork and procedures required to receive incentives	_____
o.	Quality of vendors who provide the recommended equipment/services	_____
p.	Assistance with contractors	_____
q.	Quality of Operations and Maintenance advice provided by Energy Expert	_____

Q70. Are there any specific changes that you would recommend for the program?

_____

_____

MARKET BARRIERS

Q310. Next, please tell me how important the following problems are when you are considering energy efficient equipment for your stores. Please rate each problem on scale of 1 to 6, where 1 is "not at all important" and 6 is "extremely important":

a. It's difficult to find reliable, unbiased estimates of potential energy savings _____

b. Energy efficient equipment doesn't meet payback requirements _____

c. Decisions are made at headquarters; energy efficiency is not a major concern to them _____

d. Doors would inhibit customers from reaching into cases _____

e. It's difficult to get financing for improvements _____

f. It's difficult to get trustworthy technical advice or product specifications _____

g. I'm concerned about energy, but other priorities take precedence _____

h. Other barriers _____ _____

Q312. Do you believe the percentage of high efficiency equipment installed in your stores in the next 3 to 5 years will increase___, decrease___, or stay the about the same___? (check one)

Q316.On a scale of 1 to 6, where 1 is not at all helpful and 6 is very helpful, how helpful would you find each of the following in promoting energy efficient equipment at your stores:

a. Audits like the one you received from ESG _____
b. Technical assistance _____
c. Contractor referrals _____
d. Project management assistance _____
e. Informational brochures _____
f. Demonstration stores _____
g. Rebates/incentives _____
h. Web-based information _____
i. Training for staff _____ (if 5/6, what kind would be helpful
j. Financing _____
k. Other _____ _____

Q318. Finally, I want to ask you about any energy investments or actions you may have undertaken in the past **two years** to improve the energy efficiency of your store/stores – APART FROM YOUR PARTICIPATION IN THE ENERGYSMART GROCER PROGRAM. Please tell me which actions you have taken or are taking (DON'T READ, CHECK ALL THAT APPLY):

a. An energy audit _____
b. A refrigeration audit _____

c. Maintenance of door gaskets, auto closers, etc. _____
d. A lighting retrofit _____
e. Compressor tune-up _____
f. Purchased one or more high efficiency cases _____
g. Installed more efficient case doors _____
h. Installed night covers on cases _____
i. Installed strip curtains on a walk-in cooler _____
j. Other _____ _____

Q320. How likely are you to undertake additional energy efficiency actions through the EnergySmart Grocer program at other eligible stores operated by your company?

g. Very unlikely _____ If very unlikely, why? _____
h. Somewhat likely _____
i. Very likely _____
j. Have no other stores_____

Q322. How likely would you be to undertake additional energy efficiency actions at this or other stores if the EnergySmart Grocer Program were no longer offered?

a. Very unlikely _____
b. Somewhat likely _____
c. Very likely _____
d. Have no other stores _____

Q322. Do you have any final comments about the EnergySmart Grocer program?

_____

_____

_____

_____

Those are all the questions I have for you today. Thank you very much for your time.

APPENDIX B

IMPACTS BY MEASURE

Exhibit B-1
Program Impacts by Measure

Measure	Number of Stores Receiving Recommen-dation	Number of Stores Insalling Measures	Total Number of Units Rcmd	Total Number of Units Installed	Sum Install Deemed Annual	Sum Install lifetime Deemed	Rebate $ Paid
Lighting							
<14 W Compact fluorescent lamps	176	3	1892	91	17,017	130,691	$190
14 - 26 W Compact fluorescent lamps	232	60	5422	942	223,254	1,714,591	$4,324
> 26 W Compact fluorescent lamps	455	105	2325	1370	391,820	3,009,178	$7,850
Screw-in Compact Fluorescent Lamps (14-26 watts, Reflector Lamps)	1	1	6	6	1,392	10,691	$58
2-foot 2nd generation	3	3	8	116	5,452	83,743	$427
2-foot lamp replacement	4	4	195	195	9,165	140,774	$390
3-foot 2nd generation	1	1	2	2	116	1,782	$7
3-foot lamp replacement	2	2	40	40	2,320	35,635	$110
4-foot lamp 2nd generation	16	16	2785	5883	182,373	2,801,249	$34,976
4 foot T8 w/ electronic ballast	317	23	31915	6300	195,300	2,999,808	$23,504
8 foot T8 w/ electronic ballast	358	13	53221	3188	143,460	2,203,546	$25,940
Delamping 2ft T12	1	1	0	2	246	3,779	$3
Delamping 3ft T12	1	1	0	1.34	153	2,346	$2
Delamping 4ft T12	11	6	1754	1136	216,976	3,332,751	$2,208
Delamping 8ft T12	22	10	1636	1371.75	482,856	7,416,668	$4,250
Exterior lighting 0-100 W HID from incandescent	18	3	115	20	15,420	236,851	$384
Exterior lighting 101-175 W HID from incandescent	2	1	12	7	9,471	145,475	$179
Exterior lighting > 175 W HID from incandescent	1	1	2	2	3,952	60,703	$80
Exterior lighting 0-100 W HID from mercury vapor	12	1	101	6	2,166	33,270	$106
Exterior lighting 101-175 W HID from mercury vapor	27	1	204	8	3,776	57,999	$192
Exterior lighting > 175 W HID from mercury vapor	17	1	109	12	9,156	140,636	$461
Compact and Linear Fluorescent Fixtures Incad Base (27-65watts CF Fixture)	2	6	35	53	46,905	720,461	$1,060
Compact and Linear Fluorescent Fixtures Incad Base (>90 watts CF Fixture)	2	1	16	16	11,776	180,879	$576
Compact and Linear Fluorescent Fixtures IMerc Vap Base (>90 watts CF Fixture)	7	1	52	52	28,236	433,705	$1,789
Hardwired fluorescent fixtures 27-65 W	1	1	18	18	10,224	157,041	$225
Hardwired fluorescent fixtures 66-90 W	1	0	2	0	0	0	$0
Hardwired fluorescent fixtures >90 W	3	1	39	26	41,158	632,187	$585
Interior High Bay Fixtures Four or Six Lamp T8, T5 Fixtures	10	10	862	1813	3,034,962	46,617,016	$209,865
Occupancy sensors - single office	153	8	1107	24	2,232	17,142	$238
Occupancy sensors - wall or ceiling mounted	149	3	757	6	558	4,285	$163
LED exit signs	122	20	484	108	23,652	363,295	$2,006
Lighting timeclocks	77	9	143	81	38,394	589,732	$1,150
Photocell	114	2	193	8	848	6,513	$45
Coolers and Cases							
Anti-sweat heater controls	478	39	47143	4108	1,409,044	16,232,187	$59,927
Special doors with Low Anti-Sweat Heat	456	3	13028	168	125,832	1,932,780	$8,400
Auto-Closers for Med Temp Walk In	61	8	184	36	127,260	977,357	$1,440
Auto-Closers for Low Temp Walk In	29	7	52	22	77,770	597,274	$1,100
Auto-Closers for Med Temp Reach-In	71	7	202	19	67,165	515,827	$760
Auto-Closers for Low Temp Reach-In	53	2	211	6	21,210	162,893	$300
Evap motors: shaded pole to Electronically Commutated Motor	587	11	44902	315	211,680	3,251,405	$4,725
Evap motors: shaded pole to Permanent Split Capacitor	585	2	44917	33	11,088	170,312	$528
Night Covers for vertical display case	483	24	69108	2866.5	424,242	2,036,362	$10,614
Night covers for horizontal display case	234	8	16573	892	52,628	252,614	$4,152
Medium temp open case to new reach-in	494	4	56109	153.83	89,375	1,372,804	$22,014
Medium temp open case to refurbished reach-in	495	1	56241	59	34,279	526,525	$8,850
Medium temp open case to new reach-in w/ special door	51	0	5853	0	0	0	$0
Low temp open case to new reach-in	95	14	4526	1680.97	2,030,612	31,190,197	$336,194
Low temp reach-in to new high efficiency reach-in	368	9	24449	1279.75	1,236,239	18,988,623	$256,030
Low temp open case to refurbished reach-in	83	2	3452	296	357,568	5,492,244	$59,200
Low temp reach-in to refurbished high efficiency reach-in	367	6	23778	315	146,475	2,249,856	$63,000
Low temp open case to new reach-in w/ special door	12	1	1047	115.6	174,209	2,675,853	$23,120
Low temp coffin case to new reach-in	124	9	3602	1013.54	1,224,356	18,806,113	$201,294
Evaporative Fan controller for walk-in coolers	39	2	261	3	3,327	15,970	$225
Replace cooler door gaskets	379	47	20053	6535.44	849,607	3,262,492	$14,216
Replace walk-in door gaskets	124	14	4199	2073.81	269,595	1,035,246	$6,575
Replace glass door gaskets	160	12	26726	3217.22	418,239	1,606,036	$9,142
Strip curtains for Walk-ins	588	104	62783	14216.84	6,610,831	25,385,590	$18,340
Cooler Miser Direct Install	94	94	76	94	108,664	1,564,762	$8,460
Vending machine controller	162	9	407	23	37,076	533,894	$1,326
Beverage Merchandiser Controller	280	36	906	82	94,792	1,365,005	$7,380

Exhibit B-1 (CONTINUED)
Program Impacts by Measure

Refrigeration System							
Floating head pressure controls - air cooled condenser	88	14	6897	1247.5	1,202,590	16,162,810	$72,896
Floating head pressure controls - evaporative condenser	96	13	9678	1372	548,800	7,375,872	$81,159
Multiplex compressors - air-cooled condenser	370	12	12315	983.5	2,633,813	30,341,526	$196,700
Multiplex compressors - evaporative condenser	51	1	2995	105	67,200	774,144	$21,000
Efficient/oversized air-cooled condenser for multiplex	436	4	13828	377.77	324,693	4,987,289	$41,555
Efficient/oversized water-cooled condenser for multiplex	152	2	10491	426.57	319,928	4,914,086	$46,937
Insulate bare suction line	110	3	35427	255	4,080	43,085	$139
Air-cooled to evap-cooled condenser, stand alone	270	2	5387	152.9	42,353	650,547	$34,403
Air-cooled to evap-cooled condenser, multiplex	74	0	3756	0	0	0	$0
Low Temp EE compressor	393	1	3361	2.76	2,901	41,771	$124
HVAC							
A/C Units (2-5.4 tons) air cooled TIER 1 (13 SEER packaged without TXV)	44	3	459	80	20,320	292,608	$4,280
A/C Units (2-5.4 tons) air cooled TIER 2 (13 SEER packaged with TXV)	43	0	459	0	0	0	$0
A/C Units (2-5.4 tons) air cooled TIER 3 (14 SEER packaged with TXV)	44	0	499	0	0	0	$0
A/C Units (5.4-11.25 tons) air-cooled Tier 2	15	0	330	0	0	0	$0
A/C Setback Programmable thermostats	121	0	292	0	0	0	$0
VFD on HVAC fans	41	0	683	0	0	0	$0
TOTALS					**26,534,626**	**282,068,376**	**$1,949,846**

APPENDIX C

July 2003 Process Memorandum

July 17, 2003

To: Diane Levin, Linda Irvine

From: Phil Willems

Re: Results of Initial Data Collection Effort

This memo summarizes preliminary findings from the interviews conducted as part of the evaluation effort in June. A total of 15 in-person interviews were conducted across all three IOU territories served by the ESG program. The interviews were broken down as follows:

- four ESG staff
- three representatives of two refrigerated case manufacturers (Hussman and Tyler)
- three Unified Western Grocers corporate headquarters staff
- one distributor of anti-sweat heater controls and night covers
- two refrigeration/case contractors
- one lighting contractor
- one store owner

Interviews averaged approximately an hour in length and covered topics ranging from the respondent's perception of the implementation of the program to the current status of energy efficiency in the targeted independent grocer market.

Results

Overall

All of those interviewed were satisfied with the ESG program's progress to date; however, all respondents also said that they believed additional time (beyond the original end of 2003 ending date) would be needed for the program to capitalize on the gains made thus far and move the market toward transformation. Most suggested a minimum of one additional year, citing the time that had been required to make contacts, establish procedures, and generally create the infrastructure needed for the program to succeed. Several vendors noted that they had only become aware of the program a few months ago.

In addition, it is clear that the program addresses a market with significant potential. Audit results to date, as well as comments from vendors interviewed, indicate that there are ample opportunities for quick-payback low cost measures (such as night covers, strip curtains, gasket

and automatic closer repairs, anti-sweat heater controls), intermediate measures such as lighting retrofits, and longer term improvements to cases and compressor systems.

Finally, the ESG program appears to be targeting independent grocers at an opportune time. While independents are never going to have deep pockets and unlimited access to capital, they are currently doing well in the California market. One equipment manufacturer's representative said that "these are the good old days" for independents. One of the factors that has helped independents thrive, particularly in Southern California, is their ability to adapt to the changing demographics of the region; the fact that some of the reps are fluent in Spanish helps the ESG program to be effective with the new generation of store owners who are building small chains of independent stores that cater to the large Hispanic population.

Program strengths

All the respondents (including those not employed by the program) commented on the **fundamental strengths of the ESG program design**, particularly the credibility inherent in the program's provision of high quality technical information by an independent third party.

- It was mentioned several times that grocers are often profoundly suspicious of vendors offering "too good to be true" savings from energy efficiency measures. The fact that ESG provides information without having a vested interest in the specific products offered adds tremendously to credibility.

- Credibility is further enhanced by the endorsement offered by Unified. Since Unified is a co-op, there is less distrust than there might be with a conventional wholesaler relationship.

The **audit tool** is perceived as a significant value added service provided by the program. Having this particular audit tool as a "calling card" enhances the credibility of the ESG representatives and is perceived as very valuable by owners. The reports that the reps generate are of high quality, with graphics and pictures as well as detailed calculations of measure costs and paybacks. A number of vendors commented on the high quality of the audit reports and said they are far superior to any others they had seen.

The ESG program is perceived by all those interviewed as **flexible**, with a willingness on the part of program management to make changes to better meet the needs of the independent grocer market. Specific changes mentioned include:

- Centralized initial calling and scheduling. This has freed program representatives from time-consuming scheduling activities, made more difficult by the fact that reps are often on the road or in the field.

- An increasingly streamlined participation process, from faxing out requests for bid using audit results to actually generating not-to-exceed proposals from participating vendors.

- Revision of the presentation of audit results output to assist the store owner in prioritizing energy efficiency opportunities.

The program has also modified its approach **to meet the needs of the targeted market**. Both the level of expertise of the store owners and the willingness of vendors to offer EE retrofits appear to have been overestimated when developing the initial program design.

- Most owners simply do not have the expertise or experience to interpret and act on the results of the store audit. ESG field staff have had to spend significantly more time than anticipated following up; for example, helping owners interpret the results of the audit, assisting stores with the procurement process, encouraging vendors to provide bids, and then helping to evaluate the bids.

- For many vendors, independent grocers (particularly those in rural areas/small towns and those with only one or a few stores) are not worth the marketing effort for relatively small jobs whose potential profit margin does not justify the cost of driving out to the store, gathering information and developing a bid. Even identifying the opportunity and having the grocer send out a request for bids to contractors in the area often was not enough to generate a response from vendors.

The changes in the participation process noted above have helped to **address these market barriers** initially encountered by the ESG program. It is now possible for a store owner to authorize work on recommended measures immediately after review of the audit results. Alternatively, requests for bids can be faxed to several vendors who have agreed to work with the ESG program, giving the owner the choice of several qualified suppliers. For owners, the program provides one-stop shopping for energy efficiency services; for vendors, it pre-screens potential customers to hold down marketing costs.

Program Issues/Weaknesses

Given the **limited time frame for the ESG**, the greatest challenge faced to date has been the need to jump-start the process by which stores receive audits, identify opportunities, and implement energy efficiency measures. To overcome the barriers discussed above (i.e lack of expertise among owners, lack of interest among vendors), ESG program manager have had to aggressively build the infrastructure needed to allow independent grocers to move forward with energy efficiency initiatives.

Competition from Express Efficiency program, which at times offered double or triple the "normal" incentive levels available through the ESG program, caused some stores to install measures through the EE program rather than the ESG program. On the other hand, store owners clearly see the difference between the quality of the services offered by ESG and the lack of services offered by the EE program. One ESG rep reported seeing a utility auditor leaving a store with a comment to the effect that "there's nothing to be done here," even though the ESG audit subsequently identified numerous energy efficiency opportunities.

Despite the awareness of the program and increased interest from suppliers, **small, remote stores are still not very attractive** to vendors. ESG field reps have addressed this by combining several smaller stores to allow vendors to call on several audited stores in a single visit.

The **audit tool** received high praise from all those who have seen the finished reports, yet several reps pointed out that there is still room for improvement in the costs and savings associated with some measures.

As the participation process continues to be streamlined to encourage store owners to act on audit recommendations, there is a risk that **the ESG program may be viewed as too closely allied with one or a few vendors**.

- ESG reps say they are often asked, "who's paying you?", and having the reps generate estimates for a specific vendor puts the critical elements of independence and credibility at risk. One rep said that he had been asked, "If you're independent, why are you bringing me a bid sheet from this company?" Similarly, there is a risk that vendors start to see the ESG Program as an extension to their sales force. While the steps taken thus far to make participation easier have been necessary to get the program moving, care should be taken to ensure that the independence of the ESG auditors is maintained. It may be appropriate to limit the generation of work orders directly from the audit output to a certain maximum size; if it looks like, for example, at least a $2,000 job, perhaps the owner should be encouraged to solicit multiple bids.

- ESG representatives have, on the other hand, made their independence clear in other instances. One case vendor's representative was upset that the ESG rep had told a store owner that he really did not need new cases – installation of anti-sweat heater controls would achieve the desired result for much less money. Providing such information may jeopardize the relationship between some vendors and the program, but it is important for the representatives to continue to demonstrate their willingness to give truly unbiased advice – which may, in other instances, lead them to recommend vendors other than those with whom they have been working closely to date.

There is a risk that **the emphasis on "one-stop" shopping for owners discourages vendors of single products from participating**. In fact, one rep cited a company that was interested, but essentially turned away because they could not respond to all the measures. While there are obvious benefits to the single-source approach, it is important to make the ESG program accessible to all vendors of appropriate products. Having just a few suppliers of a full range of energy efficiency measures may promote more installations and energy savings, but it makes true transformation of the broader market more difficult to attain.

One of the ESG representatives said that **the collection of what is essentially vendor-specific data detracts from the overall value of the audit**, since it adds more time to the data collection effort and limits the rep's ability to discuss other issues with the owner. He points out that not all vendors require this detailed level of data; some are willing to take the information provided by the audit and come on-site to develop their bid.

As often happens when rebates are part of a program, **one vendor is already asking for higher rebates**, specifically for door gaskets. It may be necessary to continually remind vendors that

the goal of the ESG program is not to help them sell products, but to support independent grocers in their ability to adopt cost-effective energy efficiency measures.

While it continues to support the program, **Unified does not appear to have been very aggressive in promoting the program to its member stores**. The ESG reps have established contact with the Unified field representatives, and Unified provided space for a booth at a June trade show; however, few stores appear to find out about the program through their link with Unified.

One area that bears watching is **the ability of installed measures to perform as promised**. At least two technologies eligible for installation through the ESG program have had either actual or perceived problems in the past:

- The first generation of electronically commutated evaporator fan motors was reported by vendors to have experienced above average failure rates when first introduced. Although this issue appears to have been addressed on the technology level, there is still some perception among store owners and refrigeration contractors that ECMs may result in increased motor replacement.

- In the one store visited, two of the six CFL installed in a walk-in freezer had failed in the month or so since they were installed. The ESG rep commented that these may not have been the specific type of CFL that performs well in sub-freezing condition, and that the contractor may have installed the wrong type of CFL bulb. To the extent that there are only specific CFL bulbs that will function properly in freezers, it is very important for the program to accept only bulbs that meet those criteria. Failure of individual technologies that are seen as being recommended or endorsed by the program could adversely affect the credibility of all program recommendations.

Conclusions and Recommendations

The ESG program is working well, and, through the hard work of its staff and timely adjustments to the needs of the market, **has established the basis for increased participation** through new procedures and a network of suppliers who are willing and able to deliver EE services to independent grocers. With this infrastructure in place, the program should be able to make significant progress toward it's stated participation and energy savings goals.

Next steps should focus on further encouraging the transformation of the market. For example, ESG should concentrate on creating a broader supplier network, including more specialized vendors of narrower lines of technologies -- even if this means that some of the firms who helped create solutions early on face unwelcome (to them) competition. While solid ties have been established with case manufacturers and vendors of night covers, anti-sweat heaters, and gasket repair services, there appear to be relatively few true refrigeration contractors who are working with ESG. Similarly, the number of lighting contractors who are familiar with and participating in the program could be expanded.

As stores implement energy efficiency measures, it would be useful to **develop case studies** to disseminate information about program successes. The wholesaler link could be useful here,

particularly if Unified can be persuaded to highlight ESG success stories on their website or in their newsletters.

In summary, there appears to be significant progress by the ESG program in encouraging the adoption of EE measures and moving toward the transformation of the independent grocer market. From this preliminary assessment of progress already made and remaining potential, it appears to make sense to devote additional time and resources to this segment in the future. This issue will be investigated further as the evaluation moves forward.