INTERACTIVE CONSUMPTION AND COST INFORMATION FOR SMALL CUSTOMERS – PROGRAM PROCESS/CUSTOMER RESPONSE EVALUATION – PROGRAM YEAR 2002

FINAL

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EXECUTIVE SUMMARY

This report presents the first round of results from a two-year Study that assesses the effectiveness of PG&E's Interactive Consumption and Cost Information Program (www.californiaenergyconnection.com). Pacific Gas & Electric (PG&E) was authorized by the CPUC to oversee the development of a Web site, "*…that provides customer online access to historical energy bill information and presents information on tariff options, representative energy usage and cost information for common appliances, and other information to better support the needs of small customers.*" As part of this effort, PG&E contracted a software company to design this initial information Web site. Currently, PG&E contracted the services of the Quantum Consulting/Socratic Technologies team to measure the effectiveness of the Interactive Consumption and Cost Information Web Site with residential and small business customers.

This report thoroughly evaluates the web site (which aspects of the site's features, services, content and layout work well, and which need improvement) and estimates the potential for the site to provide quantifiable energy savings and the site's effect on customers' intentions to adopt energy savings measures and on their knowledge and attitudes about energy efficiency and conservation. We reserve a fuller assessment of its energy savings impact for the second year of the Web Program, after more residential and business customers have visited the site, completed the online audit and implemented energy saving recommendations.

The evaluation employs multiple methodologies – including usability testing, online survey of website users and non-users, heuristic review, analysis of web site statistics – to offer a robust assessment of the web site. An integrated set of high level findings and recommendations are presented below.

OBJECTIVES, DATA SOURCES AND METHODOLOGIES

Exhibit ES-1 summarizes study objectives and indicates whether the study has met them and where the report addresses them.

Exhibit ES-1
Evaluation Objectives

	OBJECTIVE MET	Heuristic Review/ WebTrends Analysis	Usability Research	Stakeholder Interviews	Survey Research	Impact Evalutaion	Recommendations
Primary Objectives							
What kinds of information do users look at	●	●	●		●		
Analysis of web site user data	●	●					
number of visitors	●	●					
return visits	●	●	●		●		
click patterns	●	●					
click-through rates to manufacturer's web sites	●	●			●		
Contact users and non-users to discuss their satisfaction with information on the site	●		●		●		
User feedback on web site enhancement	●		●				●
Secondary Objectives							
Usefulness of the web site	●	●	●		●		
Examine web site focus group reports and other relevant customer research	●	●					
Changes in behavior regarding energy usage	●					●	
Examine branding and sponsorship	●		●		●		
Assess effectiveness of incentive in attracting new users	●				●		
Recommendations for improvement	●						●

● Objective Fully Met
● Objective Partially Met

This evaluation fully addresses every objective except for one (click through rates to manufacturer's Web sites, which was not tracked in WebTrends, as discussed below).

Our approach to fulfilling these Study objectives is based on five separate analyses that utilize five data sources: user interviews, WebTrends, audit data, quantitative Web survey and staff interviews. The assessment results, particularly user feedback on the usefulness and thoroughness of Web site tools and information, inform a comprehensive, actionable set of recommendations to improve the Web program.

- ***Heuristic Evaluation.*** This evaluation provides insight into where users are currently going on the site and where they are dropping off, how the site compares against current Web standards and conventions, and a listing of recommendations for the "low hanging fruit" that can be quickly addressed to improve the overall user experience. This evaluation was conducted by Socratic Technologies' usability specialists, who conducted user interface tests.

- ***WebTrends Analysis.*** A click path analysis using server log data provided insight into visitation of key areas of site real estate. The WebTrends analysis, based on the available sample of 756 users, includes data on average length of visit, specific pages visited, and length of visit per page. Click through rates to manufacturers could not be precisely determined because the California Energy Connection web server does not log any absolute URLs of those websites hosted outside the California Energy Connection hosting environment. These URLs do not send the web server back the "user click" references to be logged. However, WebTrends did track the number of visits to specific

product information pages (where manufacturer links are located), which provided an upper bound on manufacturer click-through rates.

- ***Usability Research.*** This qualitative research was performed using in-depth usability interviewing methodology. A Socratic Technologies Usability Specialist/Moderator interviewed 16 respondents at professional field facilities in San Francisco, CA on December 2002. Respondents were asked to complete specific tasks, which allowed them to explore the californiarenergyconnection.com Web site. In so doing, users provided feedback regarding ease of navigation, design "look and feel", information layout, and site content. The usability chapter offers insight into several CPUC objectives: the kinds of information that users look at, users' satisfaction with their site, intentions to return, and suggestions for improvement.

- ***Stakeholder Interviews.*** Qualitative interviews with project stakeholders – two program administrators, an attorney, a senior project manager, a program manager, a director, and a project manager – were conducted to gain understanding of the current attitudes and perceptions of the project team members with regard to the development and purpose of the California Energy Connection Web site.

- ***Quantitative Web Survey.*** A quantitative Web survey was conducted with 300 non-users and 76 users in January 2003. Survey responses address awareness, intentions to visit, usefulness of the site, usability and satisfaction. Survey research fulfills CPUC objectives to conduct a user survey, get their feedback on the site, and learn what kinds of information they look at.

- ***Impact Evaluation.*** The impact evaluation analyzes the effects of the California Energy Connection Web site on customer behavior. We estimate the potential for the site to provide quantifiable energy savings and its ability to influence customers to adopt energy savings measures. Furthermore, we analyze the effect that the site has had on customers' intentions to adopt energy savings measures and on their knowledge and attitudes about energy efficiency and conservation.

The different methodologies are used to evaluate the five major information areas of the Web site.

- **Analyze Your Usage**. The Web site provides tools for customers to evaluate their energy consumption and identify the tips and products best suited to their particular usage patterns. The online audit tool produces a customized set of energy recommendations based on information about customers' usage patterns. Historic billing information was loaded for pilot audit users only. In addition, energy calculators compute what a customer will save by replacing an old appliance with an energy-efficient model.

- **Reduce Usage and Costs**. The Web site provides ways to lower energy bills, including no-cost techniques, high-efficiency products, rebates to renewable energy sources. This part of the Web site links energy reduction to utility rebates and third party services (such as manufacturers).

- **Energy-Saving Products**. One part of the Web site compiles information on energy saving products: on how they work, what they consume, how much they cost, who makes them, and links to equipment manufacturers.

- **Electricity Market Info.** This section of the Web site provides customers with market information such as electricity prices, tariff options and costs.

- **Current Information.** News and current headlines about the California energy market is provided in this area of the Web site.

SUMMARY OF FINDINGS

The Web site performed well overall. It is clear, well-organized and easy to navigate. Clickstream analysis suggests that two types of customers visit the Web site. Most are disinterested: 80% of users stay less than a minute, click once or twice, and exit. Twenty percent register with the Web site, explore the informational areas, claim their knowledge of energy efficiency is increased as result of their interaction, and are influenced to adopt audit recommendations, tips, and energy-saving products. The majority of registered users had a favorable impression of the Web site, felt it was very useful, and would recommend the site to others. Of all areas of the Web site, registered users rated viewing their energy usage history as the most useful and had the highest rate of satisfaction with this area, and it was the most important reason cited for visiting the site. The rebate finder area was also one of the most valuable areas of the site, but also one of the most difficult to find.

PG&E's challenge is to interest more users in the Web site – only 1.5% of 15,000 targeted customers registered with the site – and to persuade those visitors to interact more with the site's informational areas.

Analysis of Web Site User Data

The Web site has attracted relatively few users. There were 1730 unique visitors in December and January, of which only 18% registered with site (from the sites inception through January, there are over 600 customers registered, including 229 pilot users). About 80% of Web site visitors stay less than a minute, most tending to land on the splash page, click once or twice, then exit. This user attrition might be explained by lack of customer interest in energy related content and the login requirement, which was a barrier to use. Of the remaining 20% of visitors that take the time to login and explore the site, 90% viewed the tips, 10% received audit recommendations, and 21% bought energy-saving products as a result of the rebate finder and/or product and manufacturer information.

Return Visits. Forty percent of all unique visitors return to the site (WebTrends). The survey of registered users indicated that two-thirds visited the Web site 2-3 times. Indeed, 85% of registered users indicated they would return. In usability testing, most users said they would return to the site for additional information, particularly the rebate locator.

Manufacturer Links. While only 5% of registered users said they visited the site in order to learn about rebated products, 17% of registered users surveyed did purchase equipment as a result of visiting the manufacturer links.

User Satisfaction with Web Site Information

Less than 3% of visits accessed the key informational areas of the Web Site: the Analysis Tools, rebate opportunities, energy saving products, market information and energy saving tips. Most visits resulted in being dropped off the site after a few clicks. The Analysis Tools and energy-saving products had higher visitation rates than tips on energy savings, rebate opportunities, information on renewable energy and market information.

Most Explored Areas of Web Site. The survey of registered users shows that one-time visitors tended to visit energy saving tips (90%), energy calculators (80%), energy analysis (80%) and energy usage history (80%). Return visitors were most interested in tips (95%), energy saving products (93%). Registered users that made a repeat visit were least interested in energy (38%) and market news (36%).[1]

Registered users were surveyed about their satisfaction with the information they obtained from the Web site. One-time visitors were most satisfied with their energy usage history (4.10 on a 5 point scale), energy analysis (3.7), energy calculators (3.5), tips on energy savings (3.5), rebate opportunities (3.2), and energy saving products (3.1). Information about renewables, market info and energy news were least satisfactory (3.0). Return visitors, on the other hand, were more satisfied with all web site features, including rebate opportunities (3.7), energy saving products (3.8) and market information (3.7).

Low Audit Completion. Only 3% of registered residential users completed the entire audit. Of the users that started the audit, only 13% finished it. Users were disappointed with the generalness of the FastTrack audit. In usability sessions, many commented that the recommendations were "common sense" and wanted more customized information.

Login as Barrier to Use. Click path data indicates that customers dropped off login areas of the site (which house the analysis tools). Usability testing revealed that by far, the area that caused the most frustration for users was the Login feature of the site. Users were not clear why they would need to login on such a site, and many considered this requirement an obstacle to exploring the site further. In fact, users frequently commented that unless they knew why they would register on the site, they would most likely leave at this point. Usability respondents said: "This is NOT what I was expecting. I don't like this. I just want to do research – I don't want to have to login – it should be optional." "I don't have to login to places just to get information."

[1] It is important to distinguish between the click patterns of registered users and visitors. Most visits tend to be brief and not explore the site in much depth, resulting in low visitation rates on server logs, whereas registered users (who make up less than 20% of all visitors) are more inclined to spend more time exploring the site, such as tips, calculators, and analysis tools.

User Feedback on Web Site Enhancement

Requirements for Using Analysis Tools Not Clear. Requirements for using the Assessment tools are not communicated. The site does not clearly state that registration and previous bills are needed to use some of the tools. Users were not clear why they would need to login on such a site, and many considered this requirement an obstacle to exploring the site further.

Differentiate the Analysis Tools on the *Analyze Your Usage* Page. Users were not clear on the difference between the choices on the *Analyze Your Usage* landing page (Usage History & Analysis, Home Energy Analysis, Home Energy Analysis FastTrack, Energy Calculators). Nearly all users assumed they would complete a customized audit, using their own billing information, by clicking on the *Usage History and Analysis* link.

More Customized Results. Usability research, focus groups and the user/non-user survey all found that customers wanted results to be personalized to the information they provide. Users in the usability study were interested in having the audit tools customizable (e.g., use their own billing data). Users were frequently disappointed with the generalness of the information presented to them after completing some of the audit tools, and said they considered that the tools would have value being *customized* to use their own billing/housing information. Often the recommendations given to users based on their input was considered to be general and non-specific.

Change the Step Nomenclature. The "Steps" nomenclature in the *Analyze Your Usage* area is not intuitive to many users. The layout of the top level of the audit (Step 1, Analyze Your Usage; Step 2, Reduce Usage and Costs, Step 3, Energy Saving Products) implies a progression, but the three steps are independent and do not have to be completed in order.

My To Do List. While users considered the *My To Do List* interesting, many said they were not sure they would return to the site frequently enough to take advantage of such a feature.

Virtual Tour. Users almost always thought the *Virtual Tour* was a tour of an efficient building or home (not of the site).

Usefulness of the Web Site

Overall. Registered users tended to agree that the Web site was useful to them. One-time visitors were more indifferent toward the Web Site, whereas return visitors tended to believe the site was helpful in getting them to manage their energy use, and purchase energy efficiency equipment. Those that intend to return said they would most likely look for rebate opportunities (79%), look at their energy usage history (77%), get tips on energy savings (65%) or get an energy analysis (62%) in future visits. Likewise, usability testing found the California Energy Connection Web site informative and useful in terms of content. Users were frequently surprised with the functionality of the Web site, stating it was more interactive and useful than they had anticipated, based on the homepage (splash page).

Analysis Tools (Energy Analysis, Fast Track, Usage History and Analysis). Users found the usage history and analysis component to be the most useful area of the Web site, by a relatively large margin. Users also described the Home Analyzer audit tool as informative and useful, even

though users were frequently disappointed with the generalness of the information presented to them.

Rebate Finder. The *Locate Rebate* feature was considered one of the most valuable tools on the Web site, although users had difficulty locating this tool. In usability sessions and web survey, most users said they would return to the site for additional information, particularly the rebate locator.

Energy Saving Products. In the web survey, return visitors rated product information as more useful than one-time visitors, a trend that is consistent with return visitors' interest in rebates for energy saving products.

Energy Calculators. The energy calculators were considered a valuable part of the Web site, although users had difficulty locating them. Web survey respondents (registered users) ranked the usefulness of energy calculators above market information, product information and rebate opportunities.

Market Information. Usability testing and Web survey both found that current headlines/electricity market info was least preferred part of site and would not bring users back.

Changes in Behavior Regarding Energy Usage

Overall. There is strong evidence that the Web site has had some influence over customer behavior, that the Web site is capable of providing quantifiable energy savings, and that users' knowledge about energy efficiency and conservation has increased as a result of exploring the Web site.

Audit. The primary component of the Web site likely to generate savings and affect customer behavior is the audit. However, a limiting factor of the audit's potential is the relatively low number of customers that complete at least enough of the audit to get energy saving recommendations. Of the 403 residential users that registered with the site, only 10% received audit recommendations. The most significant barriers for users completing the audit and adopting recommendations are concerns with registration, the burden of entering historic billing data, and customer perception of the generalness of recommendations. For the most part, our analysis of the end use consumption and energy savings estimates generated by the audit appeared to be reasonable, but there were a few minor issues that should be reviewed. Finally, among the surveyed users that received audit recommendations, none used the rebate finder to obtain an incentive on a purchased product, indicating a lack of linkage between these areas of the Web site.

Tips. The site is also capable of generating significant energy savings and impacting customer behavior through the energy saving tips provided on the site. Over 90% of the registered users that participated in the quantitative survey reported having viewed these tips. However, there is an opportunity to increase the potential for energy savings by revising the 10 Simple Tips provided to residential and business users.

Rebate Finder and Manufacturer Links/Product Information. We also found that the site was successful in providing information that led to customer adoptions through the rebate finder,

product information and manufacturer links. Although difficult to quantify, these aspects of the site do influence customers to purchase energy efficient equipment. 21% of users surveyed said they actually purchased energy efficient equipment as a result of visiting either the rebate finder section of the Web site, the manufacturer links, or both.

Knowledge. We have also found that the site was successful in increasing customer knowledge about energy efficiency and conservation. Users showed a noticeable increase in their knowledge after they visited the site.

RECOMMENDATIONS

This table summarizes recommendations offered in the report, highlighting the most salient issues. A comprehensive recommendations table can be found in Chapter 7.

Each key issue was assigned both a category (Issue Type) as well as a rating (Severity) of how severe the issue is in relation to overall usability, as follows:

Severity – This represents the relative severity of issues, as we perceive them. Scale used is from 1 to 5, with 5 being very severe and 1 being not severe. The ratings are subjective in nature.

Issue type – Can be *strategic* or *tactical.*

Issue Area – Area the issue is related to.

Exhibit ES-2
Summary of Recommendations

Severity	Issue Type (Strategic or Tactical)	Issue Area	Recommendation	Methodology
5	Strategic	**Marketing and Awareness**	Increase customer awareness with advertising materials that better explain what the Web site does. Drive traffic to the site by: • Developing relationship marketing to include links on other relevant Web sites (i.e. CPUC, Flex Your Power, manufacturer) to the California Energy Connection Web site. • Cross-marketing Web site with pge.com as well as all other printed materials from PG&E to increase awareness of Web site and the benefits it offers customers.	User/Non-User Survey
5	Strategic/ Tactical	**Marketing and Awareness**	Promote repeat usage of the site. Results presented should be personalized to user based on information provided by the user. Focus on developing tools that will incent the users to return to the site. Survey results suggest that repeat visitors use more areas of the site and should therefore have the potential realize greater energy savings that can be attributable to the site.	Usability Interviews User/non-user survey
5	Strategic	**Audit Adoption/ Cost-Effectiveness**	Increase customer adoption of audit recommendations by reducing number of recommendations and highlighting key recommendations in the audit report. Eliminate or de-emphasize recommendations that have negative savings, excessively long payback periods or very small savings. De-emphasize more generic recommendations that are likely to have already been adopted.	Impact Evaluation
5	Strategic	**Marketing/ Audit Completion/ Audit Adoption**	*Pre-load historic billing information for all or targeted segments of the population.* Analyze usage history was considered the most important reason for visiting the site, the most useful area of the site, the area with the highest satisfaction, and the reason why most users would return to the site. Both usability testing and WebTrends analysis revealed that entering billing histories was a barrier to completing the audit. Actual historic billing data allow the audit tool to calibrate results and provide more credible savings estimates, which was a issue raised in usability interviews and user survey.	User/Non-User Survey Usability Interviews Impact Evaluation

Severity	Issue Type (Strategic or Tactical)	Issue Area	Recommendation	Methodology
5	Tactical/ Strategic	**Content/ Audit Adoption**	*Place greater emphasis on areas of the site that were of interest to users, such as Rebate Finder and Calculators.* Link the rebate finder and product information to audit recommendations, which may lead to greater adoption of recommended measures.	Usability Interviews Impact Evaluation
4	Strategic	**Content/ Audit Completion**	Communicate the benefits, distinctions, and requirements of each analysis tool or feature.	Heuristic Usability Interviews
5	Tactical	**Interface Design**	Revisit "Steps" Nomenclature – the term "Steps" for these three key navigational areas misleads users into a progression, which discouraging them from Steps 2 and 3 (including the rebate finder)	Heuristic Usability Interviews
5	Strategic	**Functionality**	Completely revisit registration functionality. Evaluate the necessity of requiring registration, and implement features that facilitate/streamline the registration process	Heuristic Usability Interviews
4	Tactical	**Functionality**	Add functionality that retains information user entered in other site tools (e.g., fast track). For example, is user indicated they did not have central air conditioning, auto fill this information in all other forms.	Usability Interviews
5	Strategic	**Ongoing refinement**	Develop a plan for ongoing research to inform future additions and changes to the site.	Heuristic

1. INTRODUCTION

This report presents the first round of results from a two-year Study that assesses the effectiveness of PG&E's Interactive Consumption and Cost Information Program (www.californiaenergyconnection.com).

Pacific Gas & Electric (PG&E) was authorized by the CPUC to oversee the development of a Web site, "*…that provides customer online access to historical energy bill information and presents information on tariff options, representative energy usage and cost information for common appliances, and other information to better support the needs of small customers.*" As part of this effort, PG&E contracted a software company to design this initial information Web site. Currently, PG&E contracted the services of the Quantum Consulting/Socratic Technologies team to measure the effectiveness of the Interactive Consumption and Cost Information Web Site with residential and small business customers.

This report thoroughly evaluates the Web site (which aspects of the site's features, services, content and layout work well, which need improvement) and estimates the potential for the site to provide quantifiable energy savings and the site's effect on customers' intentions to adopt energy savings measures and on their knowledge and attitudes about energy efficiency and conservation. We reserve a fuller assessment of its energy savings impact for the second year of the Web program, after more residential and business customers have visited the site, completed the online audit and implemented energy saving recommendations.

1.1 CALIFORNIA ENERGY CONNECTION WEB SITE

In its March 27, 2001 decision 01-03-073, the CPUC put forward objectives for the Interactive Consumption and Cost Information Program, as listed in Exhibit 1-1. The exhibit also indicates whether the Web site meets those objectives, based on the independent assessment presented in this report, as well as which major areas of the Web site address those objectives.

Exhibit 1-1
CPUC Objectives for the Web Site

PROGRAM OBJECTIVES	OBJECTIVE MET	Website Areas				
		Analyze Your Usage	Reduce Usage and Costs	Energy-Saving Products	Electricity Market Info	Current Information
Informational						
Provide online access to historical energy bill information	●	●				
Provide representative energy usage and cost information for common appliances	●	●		●		
Provide other information to better support the needs of small customers	●	●	●	●	●	●
Provide market information (electricity prices, tariff options, costs)	●				●	●
Link information on site to customer solutions, including equipment and appliance manufacturers that provide HE products and services	●			●		
Link market information with customer consumption information	●	●			●	
Help customers better understand how their elecric bills are influenced by their load profiles	●	●				
Explore nexus of utility and third party services to consumers	●		●	●		

This independent assessment finds that the Web Program has largely met CPUC objectives, providing information to consumers to help them understand what drives their energy bills and how to reduce their energy costs. The bulleted discussion below links Web site areas to the CPUC's informational objectives for the Web site.

Analyze Your Usage. The Web site provides tools for customers to evaluate their energy consumption and identify the tips and products best suited to their particular usage patterns. The online audit tool produces a customized set of energy recommendations based on information about customers' usage patterns. Historic billing information was loaded for pilot audit users only. In addition, energy calculators compute what a customer will save by replacing an old appliance with an energy-efficient model. These tools help customers better understand how their electric bills are influenced by their load profiles.

Reduce Usage and Costs. The Web site provides ways to lower energy bills, including no-cost techniques, high-efficiency products, rebates to renewable energy sources. This part of the Web site links energy reduction to utility rebates and energy saving tips.

Energy-Saving Products. One part of the Web site compiles information on energy saving products: on how they work, what they consume, how much they cost, who makes them, and links to equipment manufacturers. This part of the Web site offers customer solutions to reducing their energy bills.

Electricity Market Info. This section of the Web site provides customers with market information such as electricity prices, tariff options and costs.

Current Information. News and current headlines about the California energy market is provided in this area of the Web site.

Additional CPUC objectives were to:

- **Provide historic billing information.** This was loaded and available for the 15,000 pilot users only.

- **Reach 10,000 to 15,000 pilot customers**. PG&E sent mailers to 15,000 residential and small businesses customers offering them an incentive to visit the Web site, but there were only 229 pilot users as of the end of January 2003.[2] That is, 1.5% of customers who received the mailer logged in and registered with the Web site.

- **Inform customers through a bill insert**. The CPUC decision states that "Bill inserts should be sent to those eligible customers explaining the features of the site and offering the incentive gift certificate or coupon" while the site is under development. PG&E modified this approach, using a direct mail strategy instead of bill inserts to promote the site to the pilot group of 15,000 customers (bill inserts would have reached the entire population which was not desired).

1.2 EVALUATION OBJECTIVES AND APPROACH

Exhibit 1-2 categorizes study objectives as primary (from the CPUC decision) and secondary (from PG&E's RFP). Exhibit 1-2 summarizes these objectives and indicates whether the study has met them and where the report addresses them.

[2] The residential and business mailers can be found in Appendix C.

Exhibit 1-2
Evaluation Objectives

	OBJECTIVE MET	Heuristic Review/ WebTrends Analysis	Usability Research	Stakeholder Interviews	Survey Research	Impact Evalutaion	Recommendations
Primary Objectives							
What kinds of information do users look at	●	●	●		●		
Analysis of web site user data	●	●					
number of visitors	●	●					
return visits	●	●	●		●		
click patterns	●	●					
click-through rates to manufacturer's web sites	●	●			●		
Contact users and non-users to discuss their satisfaction with information on the site	●		●		●		
User feedback on web site enhancement	●		●				●
Secondary Objectives							
Usefulness of the web site	●	●	●		●		
Examine web site focus group reports and other relevant customer research	●	●					
Benchmark web site relative to other similar sites	●	●					
Changes in behavior regarding energy usage	●					●	
Examine branding and sponsorship	●		●		●		
Assess effectiveness of incentive in attracting new users	●				●		
Recommendations for improvement	●						●

● Objective Fully Met
● Objective Partially Met

This evaluation fully addresses every objective except for one (click through rates to manufacturer's Web sites, as discussed below).

- **What kinds of information do users look at**. We combine Web server log data (WebTrends), survey data and user interviews to comprehensively examine what information users find valuable. A click path analysis using server log data provided insight into visitation of key areas of site real estate. The WebTrends analysis, based on the available sample of 756 users, includes data on average length of visit, specific pages visited, and length of visit per page. Click through rates to manufacturers could not be precisely determined because the California Energy Connection web server does not log any absolute URLs of those websites hosted outside the California Energy Connection hosting environment. These URLs do not send the web server back the "user click" references to be logged. However, WebTrends did track the number of visits to specific product information pages (where manufacturer links are located), which provided an upper bound on manufacturer click-through rates.

- **Analysis of Web site user data**. We present Web statistics (WebTrends data) on the number of visitors, return visits and click patterns. It was not possible to directly determine manufacturer click-through rates because, once users leave the PG&E site, their online movement cannot be tracked. We get at the role of manufacturer links in three ways: (1) page visits to product information (where manufacturer links are

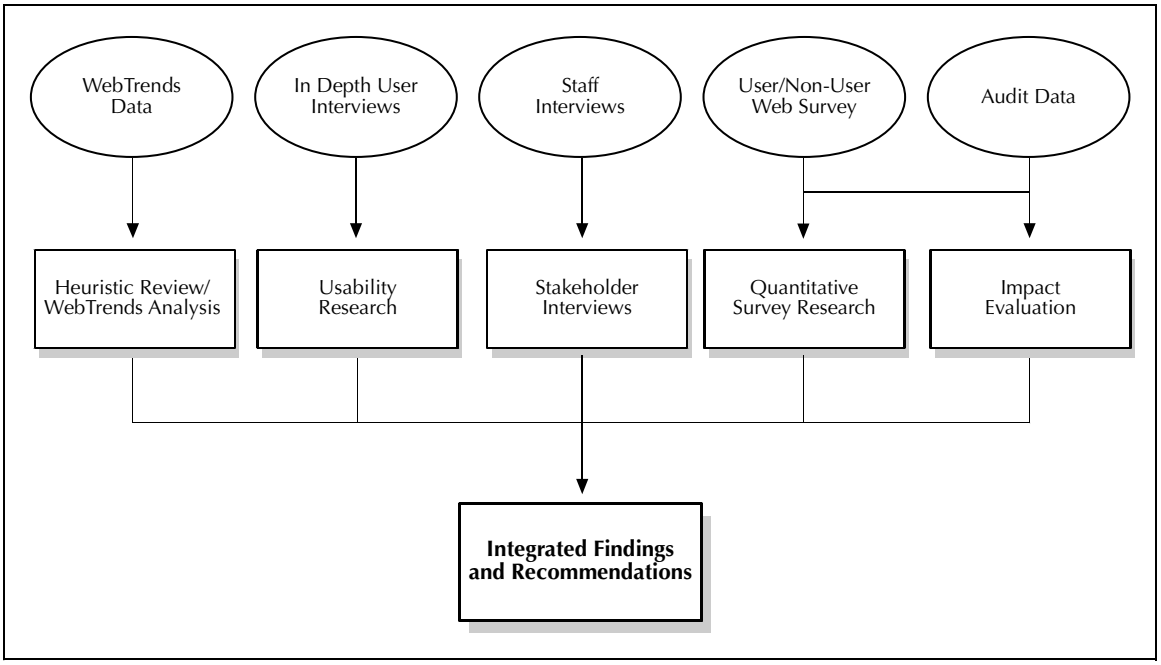
located), (2) the usefulness of energy saving product information to users, user satisfaction with product information, and (3) the influence of product information/ manufacturer links in purchasing an energy saving product.

- **Contact users and non-users to discuss their satisfaction with information on the site**. We conducted a Web-based user/non-user survey that assessed which areas of the site users visited, what they found useful and what would make them return to the site.

- **User feedback on Web site enhancement.** Suggestions for improvement were gathered from users in in-depth interviews and survey research.

Our approach to fulfilling these Study objectives, summarized in Exhibit 1-3, is based on five separate analyses that utilize five data sources: user interviews, WebTrends, audit data, quantitative Web survey and staff interviews. The assessment results, particularly user feedback on the usefulness and thoroughness of Web site tools and information, inform a comprehensive, actionable set of recommendations to improve the Web program.

Exhibit 1-3
Overview of the Approach



Each chapter of the report employs different qualitative and quantitative methodologies to evaluate the Web site. The methodologies employed – usability testing, user/non-user Web survey – are described in each chapter.

Heuristic Evaluation and WebTrends Analysis (Chapter 2), which includes a click path analysis, specifically provides insight into the following:

- Where users are currently going on the site and where they are dropping off

- A listing of recommendations for the "low hanging fruit" that can be quickly addressed to improve the overall user experience.

This evaluation was conducted by Socratic Technologies usability specialists, who conducted user interface tests. In addition, server log data was analyzed to provide insight into key areas of site real estate, offering validation for usability findings. The WebTrends analysis was based on the available sample of 756 users, and includes data on average length of visit, specific pages visited, and length of visit per page. These two research methodologies – usability testing and click stream analysis – are presented in Chapter 2's Heuristic Review. This chapter addresses several CPUC objectives: it shows the kinds of information users look at and Web site user trends.

Usability Research Report (Chapter 3). This qualitative research was performed using in-depth usability interviewing methodology. A Socratic Technologies Usability Specialist/Moderator interviewed 16 respondents at professional field facilities in San Francisco, CA in December 2002. Respondents were asked to complete specific tasks, which allowed them to explore the californiarenergyconnection.com Web site. In so doing, users provided feedback regarding ease of navigation, design "look and feel", information layout, and site content. The usability chapter offers insight into several CPUC objectives: the kinds of information that users look at, users' satisfaction with their site, intentions to return, and suggestions for improvement.

Stakeholder Interviews (Chapter 4). Qualitative interviews with project stakeholders – two program administrators, an attorney, a senior project manager, a program manager, a director, and a project manager – were conducted to gain understanding of the current attitudes and perceptions of the project team members with regard to the development and purpose of the California Energy Connection Web site.

Survey Results (Chapter 5). A quantitative Web survey was conducted with 300 non-users and 76 users in January 2003. Survey responses address awareness, intentions to visit, usefulness of the site, usability and satisfaction. Survey research fulfills CPUC objectives to conduct a user survey, get their feedback on the site, and learn what kinds of information they look at.

Impact Evaluation (Chapter 6). This chapter analyzes the effects of the California Energy Connection Web site on customer behavior. We estimate the potential for the site to provide quantifiable energy savings and its ability to influence customers to adopt energy savings measures. Furthermore, we analyze the effect that the site has had on customers' intentions to adopt energy savings measures and on their knowledge and attitudes about energy efficiency and conservation.

Recommendations (Chapter 7). The final chapter summarizes research findings and offers an integrated set of actionable recommendations focused on Web site improvement. These findings and recommendations – the result of different research methodologies working in concert – provide a robust view of the Web site.

2. HEURISTIC EVALUATION & WEBTRENDS ANALYSIS

2.1 BACKGROUND AND METHODOLOGY

This chapter presents a heuristic evaluation of California Energy Connection, and an assessment of both content and/or usability elements in similar Web sites. To complement the heuristic findings, PG&E has also requested an analysis of WebTrends server log data. This evaluation will allow management at PG&E to determine which aspects of the site's features, services, content, and layout need improvement.

We conducted User Interface (UI) tests for a variety of software and Web offerings. The evaluation included an assessment of the intuitiveness of finding information/content within the site, overall site navigation, and design "look and feel" as they relate to conventions of Web site usability. Key objectives of the heuristic analysis were to:

- Evaluate the Web site from the perspective of a usability specialist;
- Review content and navigational paths to information related to home/office energy usage assessment, energy conservation practices, and California's energy system;

While conducting the evaluation, a common set of heuristics, or rule-based conditions were kept in mind. The rules are based on common, industry-accepted usability criteria, with the major tenets being:

- Design targeted for users' needs
- Intuitive navigation
- System status visibility
- Minimalist/efficient design
- Robust error alerts
- Efficiency of use for diverse user levels
- Robustness of on-screen help and documentation

These seven "usability segments" have been gleaned from writings by leaders in usability theory such as Bruce Tognazzini (*First Principles*), Jakob Nielsen (*Ten Usability Heuristics*), and others, as well as data gathered from thousands of usability interviews conducted by the Socratic User Experience group. This experience allows the evaluators to determine what information is pertinent and when to apply any given rule. The team of Usability Specialists chose the set of criteria to specifically address learnability, efficiency, memorability, errors and satisfaction. Each set of criteria was carefully developed to assess the major issues that are repeatedly seen in formal usability studies.

Server log data, provided by the WebTrends service, was also analyzed to further elucidate findings from the heuristic evaluation. The WebTrends analysis was based on the available sample of 756 users, and includes data on average length of visit, specific pages visited, and length of visit per page. Supporting data from the WebTrends analysis are integrated with the heuristic findings into this report.

The Web site was viewed using Internet Explorer version 6.0.

Throughout this report, the following icons are used to key strengths and usability issues:

✓ Is used to indicate positive attributes that contribute to overall usability.

✘ Is used to indicate attributes that detract from overall usability.

2.2 WEBTRENDS

2.2.1 WebTrends Paths Summary

Examination of the paths reveals that 80% do not explore the site past the Splash page. These users see the Splash page and then leave the Web site without clicking on the "Residential Customers -- Click Here" or "Business Customers – Click Here" buttons. This occurred in 26.30% of visits in December, and 14.30% in January. Other findings include:

- For the Pilot Splash page, fewer than 20% of the visits in December and 40% in January resulted in users continuing from this page into the pilot registration process. Those who did not attempt registering exited the site from this page.

- The Residential Welcome page was also a single entry/exit page (users entered and exited from this page without visiting any other CaliforniaEnergyConnection.com pages) for users. This may indicate that return (cookied) users are revisiting the Web site, but not spending any time exploring the Steps.

- Both December and January illustrate how users were able to navigate directly to the Usage History and Analysis page. In both timeframes this was the most popular path over at least 4 pages long.

- A low number of paths with repeated pages versus those without repeated pages show that users are able to take short, direct paths to find information. Users do not need to use their browser's "Back" button or navigate to previously viewed pages to try different links.

2.2.2 Key Information Areas

Dividing the WebTrends data into pertinent subject areas helps illustrate which areas of the Web site users visited. It also shows what types of information users found while exploring the site, and thereby how site navigation and nomenclature might influence user behavior.

- Overall, the rate of visitation for Steps 1, 2 and 3 is low. To find each of these pages from the Residential or Business Welcome page required at least 2 clicks (except for Market Information which only required one click).

- The Analysis Tools were comparatively the most popular type of information accessed. These tools are located under "Step 1" which may influence users to visit this area before any others.

- Energy-Saving Products was the second-most visited area, with 1.33% of visits accessing these pages. While some visits did exit on these pages, the data is unable to show where these users went (they may have closed their browser, pressed the "Home" button, typed in a new URL, clicked a link to pge.com, or visited a manufacturer site).

- Tips on Energy Savings, Rebate Opportunities, and Information on Renewable Energy Sources had lowest hit rates. All three types of information were located in the "Step 2: Reduce Usage and Costs" which appears to be the least popular section of the site (in terms of key informational areas).

- Eighty percent of users leave the site from the Splash page, without exploring it further. The following table illustrates where the remaining 20% who do explore the site go.

Table of Key Information Area Visits and Exits

Type of Information Users Viewed	Percent of Visits that Accessed this Information/Page			Percent of Visits that Exited on this Page		
	December (Total= 3,514)	January (Total= 6,748)	Average	December (Total=830)	January (Total= 1,733)	Average
Analysis Tools	*2.68%*	*2.43%*	*2.51%*	*1.45%*[4]	*1.38%*[4]	*1.40%*
Tips on Energy Savings	*0.57%*	*0.71%*	*0.66%*	*<0.96%*[5]	*<1.27%*[5]	*NA*
Rebate Opportunities	*0.88%*	*0.82%*	*0.84%*	*<0.96%*[5]	*<1.27%*[5]	*NA*
Information on Renewable Energy Sources	*0.40%*[1]	*0.37%*[1]	*NA*	*<0.96%*[5]	*<1.27%*[5]	*NA*
Energy-Saving Products	*1.59%*[2]	*1.19%*[2]	*1.33%*	*2.53%*[2]	*2.19%*[2]	*2.30%*
Market Information	*1.40%*[3]	*0.84%*[3]	*1.03%*	*1.20%*[6]	*<1.27%*[5]	*NA*

[1] WebTrends lists the top 50 Pages by Visits and Renewable Energy Resources was not on that list in December or January. The least visited page on the December list had been viewed by 0.40% of visitors, and on the January list by 0.37% of visitors. It can be inferred that Information on renewables had a visitation rate less than 0.40% in December and 0.37% in January.

[2] The detailed Product Information URL points to one of the ten product-specific pages, but does not indicate which particular product was visited.

[3] In December, only the pages on Electricity Market Information (0.63%) and News Headlines (0.77%) were on the list of top 50 Pages by Views. The same pages were found in the top 50 Pages by Views list in January at the rates of 0.41% (Electricity Market Information) and 0.43% (News Headlines).

[4] Since the "nexusredirect" page directs users to either an off-site application or to the registration page. If the user has already registered and has a cookie, the redirect will lead to the off-site application. If the user has not registered or has deleted his or her cookie, this will lead to the login page. The measures in this table reflect how many users went to the actual off-site tools/applications.

[5] None of the listed pages were found on the top 20 Exit pages by Visits. For December it can be inferred that each of these pages had less than 0.96% visitation rate, and less than 1.27% for January.

[6] Only News Headlines (1.20%) is found on the top 20 Exit pages by Visits list. It can be assumed that Electricity Market Information were visited by less than 0.96% of visitors.

The following URLs from the WebTrends data were used:

Analysis Tools	http://www.californiaenergyconnection.com/calecapp/calec/nexusredirect
Tips on Energy Savings	http://www.californiaenergyconnection.com/calecapp/calec/reduce/10tips
Rebate Opportunities	http://www.californiaenergyconnection.com/calecapp/calec/SearchRebate
Information on Renewable Energy Sources	http://www.californiaenergyconnection.com/calecapp/calec/reduce_usage/renew_energy
Energy-Saving Products	http://www.californiaenergyconnection.com/calecapp/calec/res/products/detail
Market Information	http://www.californiaenergyconnection.com/calecapp/calec/rtinfo http://www.californiaenergyconnection.com/calecapp/calec/elec_mkt_info http://www.californiaenergyconnection.com/calecapp/calec/headline

Energy Saving Product Information and Manufacturer Click Throughs

The table below shows that the number of visits to specific product information (where manufacturer links are located). This information offers an upper bound on manufacturer click-through rates. Click through rates to manufacturers cannot be precisely determined because the California Energy Connection web server does not log any absolute URLs of those websites hosted outside the California Energy Connection hosting environment. These URLs do not send the web server back the "user click" references to be logged.

Parameter Value	Visits	%
Residential EE Products		
Heating	30	21.43%
Windows	18	12.86%
Air-Conditioning Systems	18	12.86%
Clothes Washers	12	8.57%
Clothes Dryers	8	5.71%
Lighting	8	5.71%
Refrigerator-Freezers	8	5.71%
Water Heaters	6	4.29%
Insulation & Weatherization	4	2.86%
Dishwashers	2	1.43%
Total	**114**	81.43%
Business EE Products		
Lighting	8	5.71%
Boiler Systems(Gas)	6	4.29%
Windows	2	1.43%
Compressed Air Systems	2	1.43%
Food Service	2	1.43%
Central Air-Conditioning Systems	2	1.43%
Packaged Air-Conditioning Systems	2	1.43%
Refrigeration Systems	2	1.43%
Total	**26**	18.57%

As shown above, only a few visits have included the Energy-Saving Products pages. Of the products, air-conditioners, water heaters and heating appear to be the most popular, and Insulation and Weatherization had the fewest visits. Overall, the low number of visits illustrates that most users were not progressing into the product-specific pages or the subsequent manufacturer areas. This could either indicate lack of need, unawareness of this offering, or usability issues causing navigational barriers in landing on this page.

2.2.3 Web Trends and Pilot Data

Below are listed four sets of Web Trends data captured during the evaluation phase of this research. These sets include general statistics, top paths by visit, the top pages by visits, top exits pages by visits.

General Statistics for December 1-31, 2002 and January 1-25, 2003

The general statistics illustrate the general amount of activity on the California Energy Connection Web site, including the average number of visits per day and the number of first-time and repeat visitors.

Note: The data set collected from Web Trends and included in this report has been influenced by two factors: 1) the presence of Web bots, or spiders, and 2) AOL proxy servers. Web bots are programs that surf the public Web, creating a record of existing Web sites. These programs account for a number of hits and a significant number of visitors – Web Trends shows that Web bots visited the site 67 times in December (for a total of 104 hits) and 170 times in January (240 hits). The AOL proxy servers also increased the reported number of visitors. AOL uses multiple servers during AOL user session to make requests of the subject Web site (e.g. californiaenergyconnection.com). Even though only one AOL user is surfing the Web site, in the Web Trends data it can appear that many users (i.e. 40) are visiting the site during the same hour.

Also, 16 of the December visitors were part of a usability study that used this Web site as its subject.

Statistic	December 1-31, 2002	January 1-25, 2003	Total/Average
Successful Hits For Entire Site	66,916	94,212	161,128
Average Hits Per Day	2,158	3,768	5,926
Home Page Hits	399	492	891
Page Views (Impressions)	7,809	12,695	20,504
Average Per Day	251	507	758

Visits	1,570	3,571	5,141
Average Per Day	50	142	192
Average Visit Length	11:07 minutes	9:06 minutes	9:43 minutes
International Visits	3.44%	0.67%	2.06%
Visits of Unknown Origin	5.41%	2.91%	3.18%
Visits From Your Country: United States (US)	91.15%	96.42%	93.79%
Unique Visitors	676	1,054	1,730
Visitors Who Visited Once	423	609	1,032
Visitors Who Visited More Than Once	253	445	698

"Hits" refers to the number of files requested by visitors. Each file that is accessed by a visitor (including graphics, Web page files, and documents) is counted as a hit. This is a general measure of the server traffic for Californiaenergyconnection.com, but does not indicate the number of pages viewed.

"Page views" is the count of hits that are classified as Web pages (e.g. index.jsp, about_us, and sitemap). This statistic presents a more detailed picture of how many pages were viewed.

A **"Visit"** is the time from when a user views the first page of Californiaenergyconnection.com until he/she leaves the site (or is inactive for 30 minutes). A visit is sometimes also called a "session."

"Visitors" are individual users of the Web site. "Unique visitors" counts each visitor only once, even if they return to the site multiple times during the specified time interval.

Pilot User Statistics through January 31, 2002

To compliment the above data, included are the statistics of Pilot users (individuals who were sent Californiaenergyconnection.com promotional materials). These users represent a sub-set of the above data. The PG&E electricity billing information of these users (those that registered) was incorporated into the usage tools in Californiaenergyconnection.com. Pilot users were also incented a "free gift" for registering.

Customer Statistics Summary	Number
Number of pilot customers who have registered	229
Number of pilot customers who have activated their registration	213
Number of pilot customers who have registered and availed their gifts	148
Number of non-pilot customers who have registered	379
Number of non-pilot customers who have activated their registration	366
Total number of customers who have registered	608

The above table also illustrates how many users (both non-pilot and pilot) have registered on the Web site since June 2002 (608). It also shows that most pilot and non-pilot users have activated their registration (pilot: 93%, non-pilot: 97%). Once users register, they are likely to activate their accounts.

Number of Users who Registered	December	January
Pilot	35	148
Non-Pilot	46	84
Total	81	232

Comparing the total number of users who registered to the total number of unique visitors in December and January, it is shown that 12% of unique visitors registered in December 2002 and 22% of unique visitors registered in January 2003.

Gift Name	Number of Times Selected
White Motion Detector	35
24 Hour Heavy Duty Timer	32
Philips 20 Watt Marathon Compact Fluorescent Bulb	24
TCP 16 Watt BR30 Compact Fluorescent Bulb	16
Ivory Motion Detector	12
TCP 16 Watt R40 Compact Fluorescent Bulb	11
White Lutron Slide Dimmer	9
Spring Wound 60 Minute Timer	6
Ivory Lutron Slide Dimmer	3

Looking at the gifts chosen by pilot users since June 2002, the three most popular gifts have been: White Motion Detector, 24-Hour Heavy Duty Timer, and the Philips 20 Watt Marathon Compact Fluorescent Bulb.

2.2.4 Top Paths Through Site by Visits

The "top paths by visits" illustrate the most frequently used paths through Californiaenergyconnection.com. A "path" is the list of pages in chronological order that a user views during his/her visit. As noted above, both AOL proxy servers and Web bots have muddied the data that supplies these paths, particularly in the cases of single-page paths.

December Top Paths

Rank	Percent	Path
1.	26.30%	
2.	2.20%	
3.	2.20%	 →  → **Pilot Registration**
4.	1.94%	

The top four paths in the data are all variations of visiting the **Splash Page**, and then immediately leaving the Web site. Users may not have found compelling information on the splash page.

The second-most common path was arriving at the **Residential Welcome** page, and the immediately leaving the Web site. For this to happen users must have previously visited the site (and been cookied).

Tied for second-most common path was the 3-page path to the **Pilot Registration** page. This path results in registration and is an example of a pilot user filling out the registration form.

Some users visited the **Pilot Splash** page and immediately left the site. As with the Splash page, users may not have found compelling or enticing content.

5. **1.94%**

Tied for third was the 4-page path to the **Usage History and Analysis** page by returning Residential visitors (the Login page was not accessed). These users did not continue with the usage analysis. One reason may be that they did not want to enter, or have available, their usage data.

January Top Paths

Rank	Percent	Path
1.	14.30%	
2.	3.50%	
3.	2.97%	

Three of the top five paths in the data are all variations of visiting the **Splash Page**, and then immediately leaving the Web site. As noted above, this page may not have interested users enough to continue.

Second was the 4-page path to the **Usage History and Analysis** page by returning Residential visitors (the Login page was not accessed). These users did not continue with the usage analysis. One reason may be that they did not want to enter, or have available, their usage data.

Some users visited the **Pilot Splash** page and immediately left the site.

4. **2.20%**

The fourth-most common path was a single view of the **Residential Welcome** page. For this to happen users must have previously visited the site (and been cookied).

5. **1.87%**

→

→ **Pilot Registration**

A 3-page path to the **Pilot Registration** was fifth in the list of most common paths. This path shows pilot users registering.

2.2.5 Top Pages by Visits

This data set ranks pages by the number of times each has been visited. A visit counts as the time beginning when a user views the first page on California Energy Connection until the user leaves the site. Even though a user might view a page multiple times in a visit, the page is only counted once during the visit. For example, if a user enters on the Residential Home page, uses a calculator, returns to the Residential Home page, looks at the products page, then leaves -- the Residential Home page is counted as having had one visit.

December Top Pages by Visits

Rank	Percent	Page
1.	21.29%	http://www.californiaenergyconnection.com/calecapp/ http://www.californiaenergyconnection.com/
2.	7.14%	http://www.californiaenergyconnection.com/calecapp/calec/residential_welcome

The **Splash** page is an indicator of how many new users are visiting the site (assuming a low rate of cookie-attrition).

Over 7% of visits in December included the **Residential Welcome** page.

Compared to Steps 2 and 3, **Step 1** and its daughter pages had many more visitors.

http://www.californiaenergyconnection.com/calecapp/calec/res/analyze/

3. **6.94%**

http://www.californiaenergyconnection.com/calecapp/calec/j_security_check

Login Page – Incorrect

4. **4.00%**

http://www.californiaenergyconnection.com/calecapp/calec/AnalyzeUsage/

5. **3.60%**

January Top Pages by Visits

Rank	Percent	Page
1.	15.17%	

As in December, January had a significant number of new visitors.

http://www.californiaenergyconnection.com/calecapp/

http://www.californiaenergyconnection.com/

2.	7.21%	

http://www.californiaenergyconnection.com/calecapp/calec/residential_welcome

Residential Welcome page

3.	6.18%	

http://www.californiaenergyconnection.com/calecapp/calec/res/analyze/

Step One/Analyze Your Usage page

The **Pilot Splash** page received much more traffic in January than December.

4. **4.70%**

http://www.californiaenergyconnection.com/respilot

Pilot Splash page

5. **4.14%**

http://www.californiaenergyconnection.com/calecapp/calec/res/pilotregistrationform

Pilot Registration Form

2.2.6 Top Exit Pages

An exit page is the last page a user views before leaving the California Energy Connection Web site. Each visit has only one exit page. These pages help illustrate when and where users left the site.

December Top Exit Pages

Rank	Percent	Page
1.	32.25%	http://www.californiaenergyconnection.com/calecapp/ http://www.californiaenergyconnection.com/
2.	8.40%	http://www.californiaenergyconnection.com/calecapp/calec/residential_welcome **Residential Welcome page**

Many users appear to leave from the **Splash** page.

That users exited on the **Residential Welcome** page does not necessarily mean that they only visited this page. A user might start here visit many other pages, and then return here before exiting.

3. **7.99%**

http://www.californiaenergyconnection.com/calecapp/calec/res/analyze/

Step One/Analyze Your Usage page

Some users may exit at the **Usage History and Analysis** page due to an unwillingness to manually enter usage data.

4. **3.25%**

http://www.californiaenergyconnection.com/calecapp/calec/AnalyzeUsage/

Users exiting at the products Details page could be using a 3rd party link on the page to leave Web site.

5. **2.85%**

http://www.californiaenergyconnection.com/calecapp/calec/res/products/detail/

Products Details page
(One of 10 possible Products Details pages.)

January Top Exit Pages

Rank	Percent	Page

Many users appear to leave from the **Splash** page, but fewer than in December.

1. **18.27%**

http://www.californiaenergyconnection.com/calecapp/

http://www.californiaenergyconnection.com/

Splash page

2. **7.59%**

http://www.californiaenergyconnection.com/calecapp/calec/residential_welcome

Residential Welcome page

3. **4.64%**

http://www.californiaenergyconnection.com/respilot

Pilot Splash page

4. **4.29%**

http://www.californiaenergyconnection.com/calecapp/calec/res/analyze/

Step One/Analyze Your Usage page

The **Pilot Registration Form** is a stopping point for some users. This may be due to users not having their account number handy.

5. **4.29%**

http://www.californiaenergyconnection.com/calecapp/calec/res/pilotregistrationform

Pilot Registration Form

2.3 DETAILED FINDINGS – CALIFORNIA ENERGY CONNECTION

While some of the issues that were revealed during the evaluation are specific to certain areas of the site, other issues apply to the site as a whole or manifest themselves in a number of different instances throughout the site. Therefore, the following analysis occurs in two sections. The first section addresses high-level findings and issues that are found throughout the site. The second section addresses issues that are specific to certain areas of the site.

2.3.1 High-Level Findings

- ✓ **Navigation throughout the site is consistent and serves as an effective conduit for locating content.** As shown in the WebTrends data, paths taken by users are short and direct. In December, of the 19 most common paths from the homepage that consisted of more than one page, 15 did not contain repeated pages. This suggests that users were able to navigate to the desired page(s) without becoming "lost".

- ✓ **The site employs judicious use of bolded text** to highlight key information and facilitate scanning. This allows users to quickly assess a page's contents and identify areas that are of interest to them. By avoiding over-use of bold text, the site's efficiency and value are maintained.

- ✓ **Bullets throughout the site also contribute to scanability, although they are absent on a few key pages.** An example of the latter is the Analyze Your Usage main page, where the tools would be easier to differentiate with bullets of key features/attributes in place of the paragraphs that currently appear.

- ✓ **In general, the site employs efficient use of "screen real estate," and information is organized intuitively within the page.** On any given page, content is broken out into useful groups; a header accompanies each group of text and concisely communicates the topic of the text block.

- ✓ **Most icons used on the site are relevant to the accompanying link**, and therefore enhance page "scanability." For example, the Energy Saving Products page features icons that illustrate and reinforce the adjacent links (example below). By providing a visual complement to each link, users can quickly identify the appropriate link.

- ✓ **"Highlights" such as Product Spotlight and Featured Tool encourage users to explore other areas of the site** without detracting focus from the main content area of the page. The consistent placement and succinct wording of these features are likely to enhance users' understanding of the site's offerings and entice them to take advantage of the information available to them.

- **The Web site logo does not consistently link to the home page.** An example of this is found on the Registration page, where the logo is not an active link. Users who rely on this functionality to navigate within the site may become confused or frustrated when they encounter logos that do not function in this manner.

- **The Business/Personal tabs may not be intuitive because their behavior does not follow Web tab convention.** On most sites that use a tab-like navigation scheme, clicking on a tab brings the icon to the "front," while it remains in its original order among other tabs. However, on the Web site, clicking to a different tab causes the tab's text to move to the left, rather than "bringing the tab to the front." This may be disorienting to users, who are likely to be accustomed to the behavior like that on Amazon.com.

Web tab structure

Amazon tab structure

- **The user's current location in the site is not displayed prominently or consistently.** When on the main page for any of the five sections, the text of the corresponding button in the left navigation bar appears in white, while the other section titles appear in blue. However, this is not true on some pages deeper within these sections (particularly in sections that do not employ a second level of navigation in the left navigation bar), where there is no indication of the user's current section. For example, on the main Energy Saving Products page, the corresponding text is highlighted in the left navigation. However, after clicking on Boiler Systems (Gas), there is no highlighting, and there is no other indication of the current section. This inconsistency may confuse users, as they must navigate to previous pages in order to confirm which section they are currently in.

- **External links are not labeled accordingly, nor are some pages that open as PDFs.** Because external links are not labeled, users may become confused or disoriented when a link leads them to a page with a design and navigational system different from that of the Web site. For example, within the Energy Saver Products page, the link to Boiler Systems Guide leads the user to an external site. This can be disorienting for users, especially if they do not realize they are on a new site or in a new window. Additionally, some links to PDFs are not labeled as such, which may cause frustration

for users who do not have the Acrobat Reader, or are merely browsing information and are not ready to commit to downloading a file. (Additionally, some users avoid viewing PDFs because of their longer download time).

✘ **The To-do List functionality is not adequately described.** Although an "Add to To-Do List" link appears with tips and other information throughout the site, the site does not promote or describe the feature. Because its functionality is not prominently communicated, users may not understand what the To-Do list is or how it works.

2.3.2 Area-Specific Findings

Overall, specific areas of the site are straightforward, informative, and easy to use. Furthermore, page layout and design is generally consistent throughout the site, which typically enhances the overall user experience.

Splash/Home page

The home page is well designed and avoids overuse of excessive graphics or text. The page provides clear links to key areas of the site and makes use of limited but intuitive graphics to contribute to overall usability.

✓ **The splash page is very straightforward** and clearly communicates that users must select the business or residential option. The bulleted list is easy to scan, which enhances the effectiveness of the page in "feeding" users into the correct silo. Furthermore, because the selection is saved as a cookie, users do not encounter this page on subsequent visits; this contributes to overall efficiency of navigation.

✓ **On the home page, the purpose of the site is immediately clear;** this is aided by the headers used in the 1-2-3 areas, as well as the mission statement that appears in the top banner throughout the site. The effectiveness of the home page is supported by the WebTrends data; while over 73% explored deeper into the Web site, 26% (December) and 14% (January) of users only visited the splash and/or homepages.

- **The strong "call to action" on the home page is not carried out throughout the site.** The home page prominently features a "call to action" of 1-2-3 steps. However, after the user begins one of the steps and clicks deeper into the site, there is no distinct path for the user to follow. In fact, the paths leading to the Residential Welcome page account for over 7% of user paths:

Percentage of Visits which Accessed Steps:

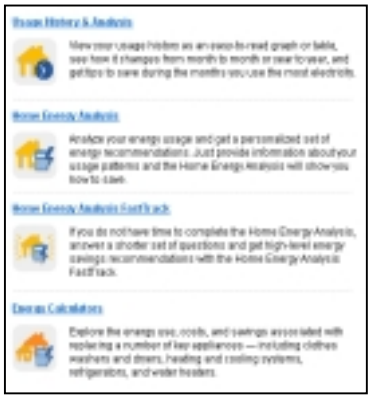
Page	December	January
Residential Welcome	7.14%	7.21%
Step 1	6.94%	6.18%
Step 2	1.78%	1.41%
Step 3	2.33%	1.55%

This suggests that the site "loses" a large portion of its users within or after visiting the Analyze Your Usage (Step 1) section.

- **The survey feature may not be intuitive to users.** Although most sites' online polling features use a "Submit" label to indicate where to cast a vote, the corresponding button on the Web site is labeled "Include my Vote." To users who are accustomed to seeing "Submit" in this type of context, the variation used on the Web site may be confusing. Furthermore, after a vote is submitted, the page refreshes to the top of the screen, which obscures the poll's results that appear "below the fold." Consequently, many users may not realize that the results are available, or may not be sure if their vote was submitted correctly.

Analyze Your Usage

- **Many links in the analysis section result in unnecessary pop-up windows,** which could lead to user confusion. In some instances, a single navigational path leads to up to 2 additional pop-up windows.



- **The Analyze Your Usage page does not clearly differentiate the analysis tools.** The tools have very similar names, and users are likely to need to read the description for each tool before they can understand which one best addresses their interests. Additionally, the icons that accompany each tool's description do not aid in clarifying each tool's specialty.

- **The Analyze Your Usage page does not indicate that some tools require registration**. This is communicated only after a particular tool is selected, and there is no explanation of why this requirement exists. This may frustrate or disappoint users who do not want to take the

time to register. Users may be more willing to register if the registration requirement is mentioned on the main Analyze Your Usage page (e.g. within the text describing the Usage History and Analysis tool), and if specific benefits of registration are listed on an individual tool's login page. Over 6 percent of visits in both December and January viewed the Step 1: Analyze Your Usage page, but only 2.51% access the Analysis Tools. One reason for the low tool usage is that the registration screen might cause some users to leave the page or Web site.

✘ **Requirements of the Usage History & Analysis tool are not communicated early in the process –** In addition to registration, the Usage History & Analysis tool requires that users enter data from past utility bills before the analysis can be generated. This requirement is significant and is noted only after a user has registered/logged in to the area. This may be disappointing for users who register and then find out that they are not able proceed without a bill. The following issues may also cause confusion for users of this tool:

- **It is not clear that it is not necessary to enter the entire usage history** – this is mentioned in a statement at the top of the page, but its small font size makes it less likely to be noticed.
- **Users may not know where to locate their consumption data on the utility bill.** Screen shots of example bills, with the needed data circled, would help guide users to this information.

✘ **The design of the Home Energy Analysis tool is inconsistent from the rest of the Web site.** This may be confusing to users, who must acquaint themselves with a new navigational system and visual design. Additionally, the Home Energy Analysis Tool makes use of a small typeface which may be difficult for some users to read.

Reduce Usage & Costs

✓ **Much of the content in this section is straightforward and simply written,** making it a likely source of useful and actionable information. In particular, the 10 Simple Tips are an example of a succinct page written with users' needs in mind.

Energy-Saving Products

✘ **Product-related links within this section are not direct links to energy-efficient products,** and instead lead to the company's home page. Users who click on a link for a particular company must then navigate the new site in order to locate energy-efficient products. This adds an extra step for the user and provides an additional opportunity for users to become lost or confused on the external site.

✘ **Some links and pages in this section are not consistently designed.** For example, the link to the Commercial Office Systems guide opens in a pop-up window with no warning. Furthermore, the new window makes use of a look and feel that are not in keeping with the rest of the Web site. This could be disorienting to users, who may not expect a new window or a new visual design.

Electricity Market Info

- ✓ **This section provides key information in a format and style that are likely to be useful** for visitors to the site, particularly the Rate Options page. These pages present a typically complex topic in a straightforward, clearly written manner.

Registration

- ✓ **After clicking the Registration link on the Web site home page, users encounter a page containing specific benefits of registration.** By providing concrete details on features accessible via registration, users are able to make an informed decision of whether or not to register.

- ✓ **The registration process itself is typical of similar sites;** the information required within registration is straightforward and is unlikely to cause difficulty for users.

- ✓ **The site's Privacy Policy is summarized next to the email field.** Users who are concerned about privacy are able to see the policy without leaving the registration process itself.

- ✓ **Once users have logged in, the "Logout" button is used consistently throughout the site,** and allows users to end their session at any time.

Virtual Tour

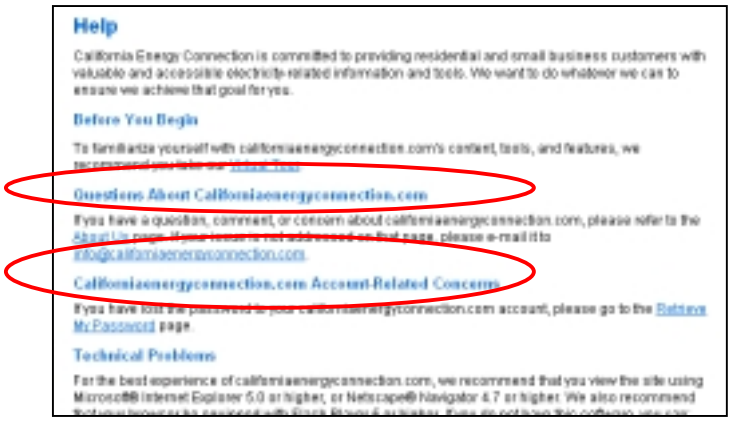
- ✓ **The Virtual Tour makes use of several "best practices" for Web usability.** The user's current location in the tour is visually differentiated from the other links in the navigation bar, and users are notified that some links will open in another window. This maximizes the control users have in navigating the tour.

- ✗ **The light-colored text within the tour, however, may be difficult for some users to read.**

Help

✓ **The help section is generally designed for good usability, and provides useful information.**

✘ **At the same time, many of the headers in the section are long and therefore not written for optimal scanning.** In this way, the process of locating needed information is slowed.



2.5 CONCLUSIONS

Overall, the Web site is easy to use and provides customers with valuable information and functionality. The site also provides an excellent conduit through which Pacific Gas & Electric can extend and strengthen relationships with its customers.

2.5.1 Summary of Findings

Following is a summary of key strengths and issues in terms of usability, WebTrends data:

Strengths

- ✓ The purpose and function of the site are immediately clear upon visiting the homepage.
- ✓ The use of color, text, and imagery throughout the Web site contribute to overall successful usability in that they are used judiciously and do not "overload" the user with information.
- ✓ Navigation throughout the site is consistent and provides a stable structure in which users can easily find information/content.
- ✓ High-level organization of information and corresponding section nomenclature are intuitive; Residential and Business content is clearly distinguished.
- ✓ Copy is brief and to the point, allowing users to quickly scan the sites' pages for key information.
- ✓ Site is kept "fresh" with current articles about energy and conservation.

Usability Issues

- ✘ According to WebTrends data, over 79% of the visits to the site were less than one minute in duration. Although this may not be a usability issue in itself, it is likely an indicator of other usability problems that discourage users from exploring the site fully.
- ✘ The URL is long and may not be intuitive or memorable to users.
- ✘ Links often act in unexpected ways and without warning; many links result in pop-ups, external sites, or PDFs without any prior communication to the user.
- ✘ The requirements for using the Assessment tools are not communicated, as the site does not clearly state that registration and previous bills are needed to use some of the tools.

2.5.2 Recommendations & Next Steps

Based on these findings from the heuristic evaluation, Socratic offers the following recommendations. These recommendations are part of an overall effort to improve the site's effectiveness.

The following table contains key issues uncovered in the research, and subsequent recommendations, which are based on our expertise from conducting hundreds of user experience testing world-wide, as well as industry best practices. **An exhaustive list of recommendations for overall Web site improvement can be found in the final report for this study, which contains findings and recommendations based on all phases of the research program (e.g., Heuristic evaluation, usability interviews, and quantitative survey).**

Each key issue was assigned both a category (Issue Type) as well as a rating (Severity) of how severe the issue is in relation to overall usability, as follows:

Severity – This represents the relative severity of issues, as we perceive them. Scale used is from 1 to 5, with 5 being very severe and 1 being not severe. The ratings are subjective in nature.

Issue type – Can be *strategic* or *tactical.*

Issue Area – Area the issue is related to.

Severity	Issue Type (Strategic or Tactical)	Issue Area	Recommendation
Overall			
5	Tactical	**Marketing and Awareness**	Consider changing the URL to a shorter, more memorable domain Alternatives such as CalEnergy.com, EnergyCA.com, or EnergyInfoCA.com may be more user-friendly and easy to type.
Homepage			
2	Tactical	**Messaging/ Navigation**	Incorporate the 3-Step metaphor, found on the home page, throughout the site. Consider adding a "1", "2", and "3" to the corresponding links in the left navigation bar, as well as on corresponding page headers.
2	Tactical	**Interface Design**	Revise the survey feature to be more in keeping with other, similar survey "widgets" on the Web. Change the button label from "Include My Vote" to the more conventional "Submit." After submitting a vote, refresh the page so that the results are immediately visible and do not require the user to scroll.

Severity	Issue Type (Strategic or Tactical)	Issue Area	Recommendation
Site-Wide Elements			
5	Tactical	**Navigation**	Revise the design of the navigation system to ensure that it is consistent and in keeping with Web conventions. Design navigation "tabs" so that they behave similarly to those on other sites such as Amazon.com: use a static tabs order, and identify the active tab via color or other visual indicator. Make the user's location in the site visible at all times by highlighting the corresponding link in the left navigation bar. The highlighting design can incorporate a distinct text color, distinct background color, and/or bolded text. This highlighting design should be consistent across all sections and areas of the site.
5	Tactical	**Interface Design**	Use HTML as the default display format whenever possible. Avoid use of PDF or other formats unless absolutely necessary.
5	Tactical	**Interface Design**	Use links consistently, and notify users if a link has a special behavior. If a link leads to an external site, opens in a new window, or opens a non-HTML page, include brief text or other visual cue to alert users to this. Examples found on other sites: CNN.com:  TDWaterhouse.com:  Code all pages so that the logo functions as a link to the home page.
4	Tactical	**Navigation/ Interface Design**	Avoid excessive use of pop-up windows. Use pop-up windows only when it is beneficial that the user not "lose sight of" the page they are currently viewing. As noted in a previous recommendation, links within an analysis questionnaire would be an appropriate use of pop-up windows.
4	Tactical	**Interface Design**	Use a consistent "look and feel" across all pages in the site. Redesign areas, such as the Home Energy Analysis tool, which are not visually consistent with the rest of the Web site. Make use of a consistent overall look and feel, as well as navigation system, throughout the site.

Severity	Issue Type (Strategic or Tactical)	Issue Area	Recommendation
3	Tactical	**Navigation**	When linking to external sites, make the link as "targeted" as possible. When linking to energy-efficient product manufacturers' sites, link to specific pages containing such products, rather than simply linking to the company's home page.
3	Tactical	**Information Design**	Design pages and text to facilitate easy reading and/or scanning. Headers which are used to divide sections of text should be brief and to the point, thus allowing users to quickly identify needed information. This recommendation applies to the Help section in particular. Use a large, easy-to-read font size throughout the site. Avoid using font colors that have little contrast with the background (such as in the Virtual Tour). Instead, use colors that have a high degree of contrast with the background.
Analysis Tools			
5	Tactical	**Functionality**	Revise the role of registration in analysis tools, such has: – Eliminate the registration requirement in analysis tools, or require registration only when absolutely necessary. – Allow the option to registration/save results once analysis is completed.
5	Tactical	**Content**	State specific benefits of registering on the registration page.
4	Strategic	**Messaging**	Communicate the benefits, distinctions, and requirements of each tool or feature. Clearly state the unique benefits of each analysis tool on the Analyze Your Usage page. Make careful use of descriptions to ensure that the distinct features/attributes of each tool are clearly communicated. Each tool's description should also make note of special requirements for use, such as registration or previous utility statements. Briefly state how much time and/or involvement is required for each tool's use. Provide a brief overview of the To-Do List feature prominently on the site. This overview should summarize the functionality offered and include brief instructions on how to use it.
4	Strategic	**Content**	Within usage analysis tools, make questionnaires intuitive and relevant to users' level of knowledge. Provide features to answer users' questions, such as links to more information about an item within the questionnaire. Opens each link within a popup, thus providing the supplementary information without drawing the user away from the task of completing the questionnaire.
3	Tactical	**Navigation**	Within each analysis tool, include a top progress bar shows the user's overall place in the process.

Severity	Issue Type (Strategic or Tactical)	Issue Area	Recommendation
Long-Term Considerations			
2	Strategic	**Content/ Navigation**	Consider addressing specific audiences through additional content or navigation. If appropriate, provide resources for additional audiences such as teachers and the media. Consider adding features, such as games or quizzes, aimed at teaching children about wise energy usage. Allow the option to locate information based on the user type, such as energy-efficient products appropriate for students.

3. USABILITY RESEARCH

3.1 OBJECTIVES AND METHODOLOGY

This usability assessment will allow management at PG&E to learn from users which aspects of the site's features, services, content, and layout work well, and which areas need improvement. Usability testing provides PG&E with an unbiased, third-party assessment of user feedback gathered during the usability testing.

Specific research objectives were to:

- Assess overall site usability - understand the ease with which the users are able to navigate through a series of tasks while using the Web site.
- Based on user feedback, map areas of the site that lead to errors or confusion, and gauge the relative severity of each usability issue;
- Capture user's overall reaction to the Web site including content, information hierarchy, navigation, and overall look and feel;
- Determine which features/categories are the most and least appealing to users and why.

In addition, over the past year, PG&E commissioned several rounds of qualitative focus groups with PG&E customers to gain insight into content and functionality for the Web site. Where appropriate, findings from this research augment findings uncovered from the usability testing.[3]

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[3] There are several cases where results from conceptual focus groups contrast significantly with the usability interview feedback. Anecdotal evidence suggests the reasons for this may be three-fold:

1) Difference in research methodology
2) Sample size
3) Improvements made to the site after the focus groups were conducted.

Early in the Web development process, focus groups are often used to glean qualitative directional feedback from potential users of the site. In this regard, users are exposed to the stimuli (whether it be paper mock ups, wireframes, prototypes, or even a fully functional Web site) in a rather passive manner. Ten to twelve respondents provide feedback to the stimuli by thoroughly discussing it with each other as the moderator presents it on a screen. In this scenario, respondents are not able to personalize their experience. During a usability, however, the actual user experience is tested through a series of interactions with the site. So, rather than simply rating the Web site, users actually engage with the site and all it has to offer, ultimately providing a more realistic simulation of how the user might behave should they be on their own. This in no way diminishes the importance of focus group research during the development phase, however, it does provide some insight into the variances that exist in user preference.

3.1.1 Methodology

The following summary is qualitative in nature and represents the interpretation of the researchers. While it is hoped that the participants expressed views that are representative of the population from whom we seek answers and to whom we wish to appeal, the results of this study should not be considered projectable; no statistical inferences should be drawn from qualitative data.

Qualitative research was performed using in-depth usability interviewing methodology. An experienced Socratic Technologies Usability Specialist/Moderator interviewed each respondent. The interviews were conducted at professional field facilities in San Francisco, CA on December 18th and 19th, 2002.

Respondents were asked to complete specific tasks, which allowed them to explore the californiarenergyconnection.com Web site. In so doing, users provided feedback regarding ease of navigation, design "look and feel", information layout, and site content.

- A customized Usability Lab, containing audio and video recording equipment, was used to capture respondents' reactions and to visually record the mouse movement showing where respondents navigated within the site.

- Users were asked to perform several tasks on the Web site. Specifically, respondents were asked to login and/or register on the site; conduct an usage analysis (audit); locate information on specific products, manufacturers, and rebates, as well as comment on the overall level of information on the Web site.

- During the interview, respondents were asked to "think out loud" as they navigated the site in order to articulate their expectations and experience. Additionally, the moderator asked probing questions throughout the interviews in order to fully explore users' opinions and assessments.

- Finally, users representing both the business and residential perspectives were interviewed to address any issues unique to each particular audience.

Sample Audience. A total of sixteen (16) interviews were conducted over two days, and each respondent was recruited to represent the following characteristics:

- All were PG&E customers;

Second, both the focus group methodology and usability interviewing methodology are qualitative in nature. What this means to us a researchers is that we must see it as *directional* only. It is entirely plausible that some of the variances exhibited in user site preferences could simply be a case of the user him/herself.

Finally, one could also speculate the change in user preference is due to site enhancements made based on the focus group research. Even modifications surrounding design and look and feel can sway users to have a difference of opinion regarding the site.

- Half (8) were residential customers and half (8) were non-residential (small business);
- All were responsible for or somewhat involved in making decisions about their utilities; and
- All residential customers had incomes over $20,000 and business customers had sales between $100,000 and $3,500,000.

Respondents were also recruited to meet the following specifications:

- All used a computer with access to the Internet at home or at work;
- All self-reported as being "intermediate" or "expert" computer users, and reported having conducted specific online activities; and
- None worked in competitive industries (i.e.; Web site development, utilities, marketing/advertising industries).

3.2 FINDINGS AND RECOMMENDATIONS

The following presents detailed findings and subsequent recommendations from this phase of the research. A more comprehensive list of findings and recommendations for overall site improvement can be found in Chapter 7, and includes additional recommendations based on all facets of the study (e.g., heuristic evaluation, WebTrend data assessment, usability interviews, and quantitative survey data). Screen shots are used to illustrate specific examples where issues arose. Findings represent both segments (i.e., residential and small business), unless otherwise specified.

The recommendations tables presented in this section contain key issues uncovered in the research, and subsequent recommendations. Most of the recommendations listed for each issue are ones that were proposed by users themselves. We also include our own recommendations as possible solutions to the issues that arose in testing, which are based on our expertise from conducting hundreds of user experience testing worldwide, as well as industry best practices. In the recommendations tables, each key issue is assigned both a category (Issue Type) as well as a rating (Severity) of how severe the issue is in relation to overall usability, as follows:

- **Severity** – This represents the relative severity of issues, as we perceive them. Scale used is from 1 to 5, with 5 being very severe and 1 being not severe. The ratings are subjective in nature.
- **Issue type –** Can be *strategic* or *tactical.*
- **Issue Area –** Area the issue is related to.

The following summary is representative of a total of sixteen respondents. Due to the small sample size, and the nature of qualitative research in general, findings are not reported in

percentages or number of respondents. Rather, the following terms are used to describe the frequency with which comments were heard:

- most, or nearly all,
- many,
- some,
- few.

3.2.1 Site Expectations

Prior to exploring the Web site, users were given a description of the California Energy Connection Web site and asked whether they had ever been to a site such as this, and what types of information they might find**.**

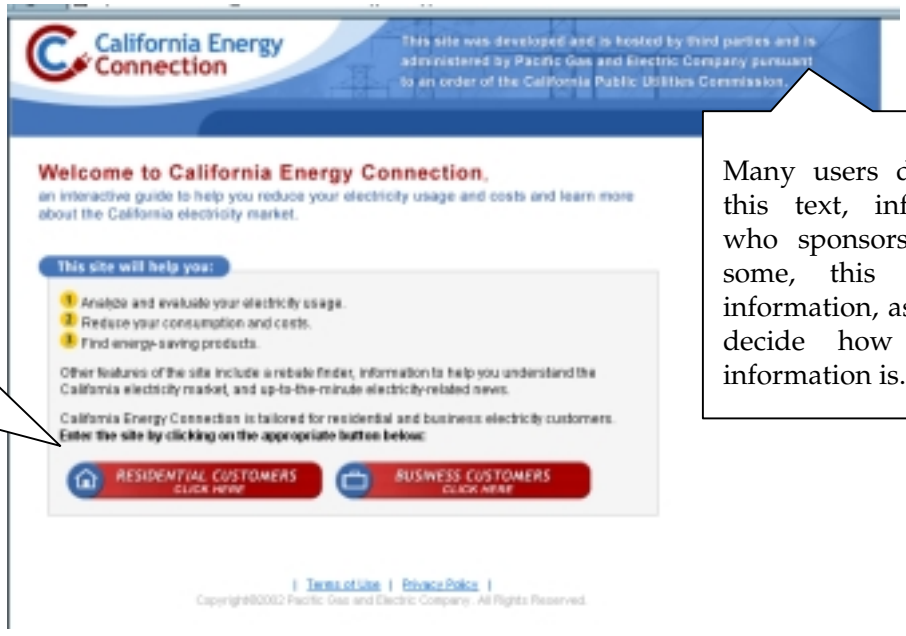
- While most respondents had never visited the californiaenergyconnection.com Web site, respondents agreed they found the Web site a useful resource, and commented they would be likely to visit the site in the future. Interestingly, this conflicts with findings from preliminary focus group research where respondents commented they would be *unlikely* to return in the future.

- Based on review of the information on the home page, most users commented they thought they would be likely to find out specific information about how much energy they are using, and how to cut back.

  "I would like to see something that is like an audit."

- There were also a few respondents who thought the site was a fee-based site offering programs to help consumers save money on their energy bills.

It was clear to all users tested where they needed to go to enter the site.



Many users did not notice this text, informing them who sponsors the site. To some, this is important information, as it helps them decide how reliable the information is.

- When users were asked who they thought might sponsor such a site, most commented they were not sure. A few said a utility (PG&E) probably backed the site in some form or another. While focus group findings cite the PG&E brand as a positive association, respondents in this research commented they might consider the information biased as a result of having the PG&E brand on the site.

"If it's PG&E or CPUC, it would make me think there is bias on the site."

- Still others thought the Web site would be more credible if it were sponsored by PG&E or the CPUC.

"…looks legitimized by the PUC. I expect accurate information here."

- At first glance users commented they would have to read the information on the page in order to determine what the overall purpose of the site was. Several users commented the site looked dry and uninteresting.

"It's kind of plain – not eye catching or interesting. It's not self-explanatory you have to read in detail what you want to know."

- After reading the information on the page, it became clear to all respondents that the purpose of the site was to help consumers save energy and control their costs.

"…anyone who pays a utility bill. Cost cutting…something like that. Educate them on how to save money."
"Anybody who pays energy bills would use this site."

- Many users also commented positively on the rebate finder, indicating this would be a key reason for visiting the site. These users also said this should be highlighted more on the splash page. This finding is consistent with respondent feedback from concept focus groups.

"I like that rebate finder."

Exhibit 3-1
Recommendations on Site Expectations

Severity	Issue Type (Strategic or Tactical)	Issue Area	Recommendation
5	Strategic	**Marketing and Awareness**	Choose an alternative URL that is more intuitive for users to land on. Cross-market Web site with pge.com as well as all other printed materials from PG&E to increase awareness of Web site and the benefits it offers customers. Work with manufacturers and other interested parties to leverage Web site URL cross-links.
4	Tactical	**Layout/Design**	Consider adding more graphical representation on homepage that will entice users to enter and explore. Users responded overall to images (including clickable links and images) more than text.
5	Tactical	**Content**	Add language to let users know they can receive rebates through the Web site, as this was, for most, a key reason for visiting the site. Consider even adding a link to the rebate finder directly on this page.

3.2.2 Homepage Exploration

Users were then allowed to launch the homepage and provide their overall opinions on the Web site, and specifically, what benefits they thought the site would offer.

- Overall, users considered the homepage to be clear in terms of what it offers, particularly by way of information to save energy. Most users commented the purpose of the Web site was to inform the consumer on energy saving measures, as well as energy in general.

"It's simple, straight to the point. Quick, not a lot of steps and procedures. Looks like it has all the things I expected to see."

- Users also considered the homepage to be visually appealing and cleanly laid-out. Nearly all users were clear where they would need to go on the site to find specific information, from the homepage.
- Several users also commented they would indeed take the time to review the Current Headlines & Electricity Market Info to learn about what was new in the industry, although they would not come to the site solely for this information.

Users sometimes became confused about whether they were in the residential area or the business area of the site because of the coloring of the links.

The *Register Now* link caused some confusion to users, as they were not sure why they would register on a site like this one. Some users commented that once they used the site once, they would not need to return, and thus, did not think they would take the time to register (note that once users began to interact with the tools on the site they said they were far more likely to return to the site again). These findings echo results from participants in preliminary focus groups who were asked about registering on a site such as this.

"I wouldn't usually, I do not want any e-mail, but I would register…if specifically interested in something or had a good experience. They are collecting information about me. I can do all this with out registering."

- Several respondents were not clear on what the virtual tour would offer them – whether that was a tour of the site, or a tour of a home with appliances. This finding is consistent with focus group results that indicated the tour should clearly outline what the site has to offer. Once this area was explored further at the end of the interview, users more often than not said they would be unlikely to use this feature.

- The first thing users noticed was the step-by-step process in the center of the page. Many users also commented on how the site appeared to be easy to use because of the way this information was displayed.

"…it seems clear…I like the 'step' process." "It's a teaching method." "Identify what items you're using, and it tells you your costs. It would probably give you ideas to turn off things like a light, or your computer, turn off your screen." "The steps look the most interesting."

- When discussing each step, users speculated they would be able to learn more about how they themselves use energy in their home in Step 1.

"I expect to find a tool that I could plug in information (personal). It would be nice to plug in your address and then all of your information comes up."

  - When probed on how this might work, users speculated they would be presented with a form to fill out with their personal information, perhaps information they would obtain from their electric bill.

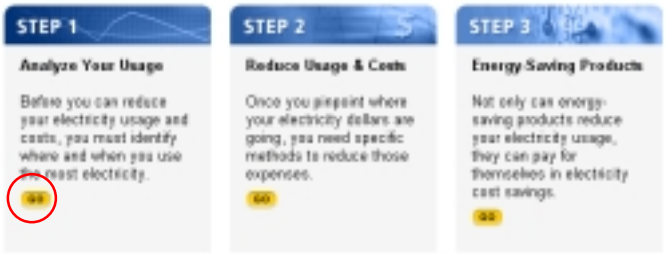
- When probed, *Step 2* to most users meant they would be able to determine specific ways to reduce energy and costs, based on the information they entered in *Step 1.* Users assumed this information would be specific to their situation.

"…based on that information (that was entered in Step 1*), there will be specific suggestions about what I can do to lower costs."*

- Finally, *Step 3* was where users expected to be able to purchase products.

"…expect to see spend money to save money things."

- Several users mentioned the *Go* buttons at the bottom of each step were confusing, as the labels *Step* indicated a process.



"The Go buttons don't make sense- would expect a Start Now button."

"Sounds like this is a decision tree format, they are going to lead me through a progression with steps 1,2,3."

- After interacting with the Web site, however, many users commented they were unclear why these links were labeled "Steps," as it later became apparent they did not have to use the steps in order. This contrasts with focus groups findings that concluded respondents considered the three step process one of the best features of the site.

"I didn't realize I could go to step 3 before doing step 1 and 2."

Exhibit 3-2
Recommendations on Homepage Exploration

Severity	Issue Type (Strategic or Tactical)	Issue Area	Recommendation
5	Strategic/ Tactical	**Registration link**	Provide language on homepage enticing users to register on the site by letting them know the benefits of registration. (Additional registration recommendations are included in the next section of this report).
4	Tactical	**Nomenclature**	Change *Go* labels within each step to something more intuitive to users such as "begin" or "start." Change *Step* nomenclature to indicate to users they do not have to explore areas in succession. For example, add language such as "What do you want to do?" and add titles like "Analyze my current usage," "Learn how to reduce my current usage and save money," and "Find information on a product that will help me save energy." Add icons or graphical representation of what each area does instead of text describing the area – users do not read.
3	Tactical	**Navigation/left navigation bar**	Change color coding scheme on left navigation bar to indicate to the user where they are in the site. For example, if the user is within the residential area of the site, business tab should be lighter color (not red).
3	Tactical	**Content/Virtual Tour**	Remove the virtual tour feature on the site entirely. Users more often than not were not clear on what this feature offered; and once users explored the area, many commented they would be unlikely to use such a feature. Having the link on the site only adds confusion and little benefit. Alternatively, should PG&E decide to leave the virtual tour on the Web site, add additional verbiage to clearly indicate to users what the tour is all about (e.g., tour of the SITE, not of an energy efficient home).

3.2.3 User Tasks

As part of the usability test, respondents were asked to find specific pieces of information called "tasks." Users began each task at the californiaenergyconnection.com home page. While users from both audiences were given some of the same tasks, a few tasks were tailored to each unique segment, based on their specific needs.

3.2.3.1 Task: Login

Once users began interacting with the site, they were met with either a *Register Now* page or a *Login* page (depending on the account information they were provided with for the test).

- By far, having to register or login to find additional information on the site was considered by users as the most frustrating part of the interview. Nearly all users commented negatively on having to register on the site for looking up energy efficiency information. Even when probed, users were able to speculate they might register

because they are entering their personal information for the analysis; however, the login screen appeared while users were trying to explore general information, which caused them frustration.

Login (Returning users) **Register on Site (First time Users)**

- Many users were not quite sure why they would need to register on a site like this, although those who were unsure speculated that it would enable them to obtain more customized information based on their specific energy usage.

"See that's how they get you – you have to sign up, they want your email address – to send you junk mail."

"Now is junk. Anything that says "free" is going to waste my time – asking for an exchange on information about me. I'm paying for something with my personal information, it's not free.

"This is NOT what I was expecting. I don't like this. I just want to do research – I don't want to have to login – it should be optional."

"I don't have to login to places just to get information. Now I have to give information to get to the next step – I feel kind of tricked. The site should have me login on the first page…not now that I've gotten this far in the process."

"Ah! My email address…okay, you need to register. I hate registering."

"Maybe if they want to know my PG&E account number that would make more sense – I guess once I log in I'll have access to my electric bill – email address might result in spam – might try to use a fake email, but might kick back."

"If I'm looking for publicly available information, why are they asking for my information?"

- Users were also concerned that once they provided their email address, they would be met with spam or unsolicited email from interested parties. Having a link to the privacy policy was not enough to make users feel comfortable that their information would not be used for marketing purposes. Focus group findings concur that this is a substantial issue for more uses of the site.

- Additionally, users commented at the end of the interview that this is the kind of site they may visit only once or twice a year, and, as such, may not remember their login information.

"It could be a year or two before I address this question again [regarding energy efficiency]…logging in could be a problem – I might not remember my information."

- Despite users surprise to having to login, most were familiar with the process and found this login process (completing the form) to be just as easy as others.

- There was some confusion for users registering on the site regarding verifying their account. Those registering tried to simply continue using the site without checking their external email account to verify the registration. When these users were faced with error messages as a result, they became confused as to what they needed to do next.

"It's very easy –a lot easier than when I go through other registrations." [User goes back to login and tries to login and receives two error messages. Moderator returns user to registration confirmation page.] *"Oh okay, you have to activate it…I didn't notice that. At first thought it was quick, but then it took longer than I thought because I had to go in and confirm my registration"*

Exhibit 3-3
Recommendations on User Tasks

Severity	Issue Type (Strategic or Tactical)	Issue Area	Recommendation
5	Strategic	**Registration**	Completely revisit registration functionality by carefully considering the following: • Decide whether users really do need to register on the Web site to use features, and if so, impress upon users why this is so (give them a call to action) by clearly outlining the benefits of registration. Simply having a link to a privacy policy is not enough. • Consider offering an initial incentive or drawing for registering on the site to entice users to register. • Make registration process itself easier by eliminating confirmation/activation step. Users do not consider their electric bill "confidential" information enough to merit the extra it takes for this added step. • Consider offering users a box to check for opting out of receiving any marketing or communication from PG&E etal.

3.2.3.2 Task: Energy Usage Analysis

In the first task, users asked to determine their energy usage for either their home or their business, depending on the type of user being interviewed.

- Nearly all respondents commented that in order to complete this task, they would start with *Step 1* in the process. When asked what they would expect to find behind *Step 1* users commented they would expect to find a form where they would enter detailed personal information, and the 'too' would conduct an analysis based on this information.

"[It will]…take information about my historical usage, different times of the year, specific information about my home, and then analyze it and give me information or tips on how to save energy – e.g., close doors…"

Users were not clear of the differences between each of these links when completing the task.

- Users in both segments were not clear on the difference between the choices on the *Analyze Your Usage* landing page. Nearly all users assumed they would complete a customized audit, using their own billing information, by clicking on the *Usage History and Analysis* link. No users in the study differentiated between the *Home Energy Analysis* and the *Fast Track.* As a result of this, many users first clicked on *Usage History and Analysis* to complete the first task (note the intended path was to click on the *Home Energy Analysis).*

"Until I look I don't know the difference between the two. They overlap. I don't understand how History Usage and Analysis would be much different that Business Energy and Analysis."

- Once users landed on the form for *Home Energy Analysis*, some were surprised to find that it was so basic. As such, users frequently assumed the following page would ask them for more specific information about their homes.

- While for most, filling out this form was intuitive; there were some obstacles that caused users minor confusion. For example, users were not sure whether they had to complete all of the necessary fields in order to progress with the form.

Users were not clear which fields were required in order to progress. Additionally, if a user selected "no" to a selection (e.g., "Do you have Central A/C?"), they were confused when asked to answer whether they or their landlord paid for A/C.

- Additionally, the lack of areas for entering information related to their account caused some confusion for users – several backed completely out of the task, returning to the homepage to try again because they did not think they were in the right place.

- Many users were surprised with the information provided by the Web site after entering such minimal information. Several questioned how this information was obtained, since they did not enter any billing information. In addition, users often found the information was incorrect based on what they entered.

- Once users clicked on the *next* button, most said they were expecting to find another screen to enter their specific information. Instead, users were presented with a graph of averages. Users were surprised by this, and questioned the value of the tool.

"I didn't see the type of appliances that I have – so it doesn't really calculate my energy use. It's showing averages of someone else."

"I'm looking for a place to enter a specific piece of equipment. This is not where I want to go."

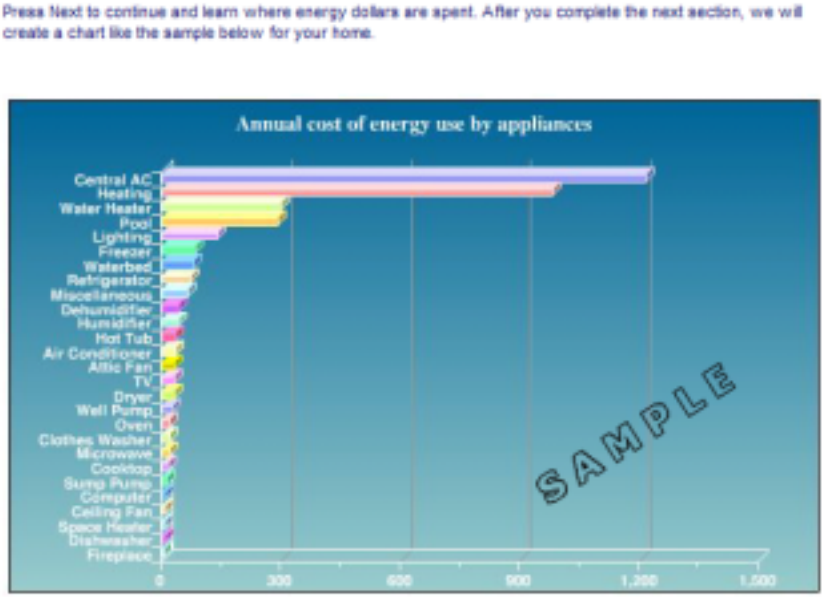
This chart held little value for most users as it was not specific to their own usage. Most said they were not interested in learning the energy costs of similar homes.

As you answer more questions, we will be able to match homes closely to yours. You can see updated numbers at any time through charts at the top of each page.

Press Next to continue and learn where energy dollars are spent. After you complete the next section, we will create a chart like the sample below for your home.

- Furthermore, users were confused why they were given a chart with the word "Sample" on it. Nearly all users *did not* read the accompanying text on this results page, causing them confusion about what the information was, and where to navigate to next.

Users do not read text in general on Web sites, particularly when this small.



- After users reviewed this page, they were not sure where they would go to next. While they noticed the *Back* and *Next* links at the bottom of the page, users illustrated confusion about what to expect, particularly if they did not read the small text.

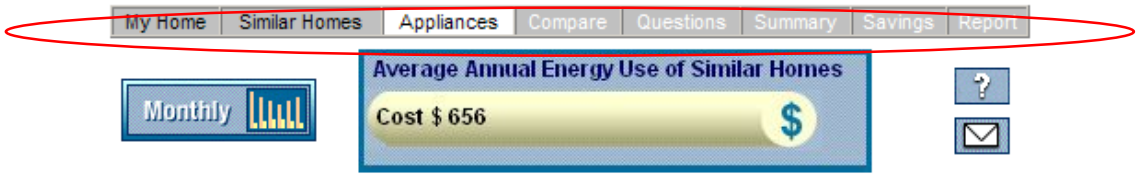
- Once users clicked the *next* button, many were not sure where they were within the site; although, users did find the graphic both visually appealing and easy to use. Users particularly liked watching the graphic change when selections were made.

- While it was intuitive for users to mouse over the appliance areas on the graphic, it was not clear to some whether all fields were required, or whether they could leave some blank. Some of the fields were also hard to read for several users, particularly drop down menus which were presented in the same gray color, making it hard for users to see an action was required.

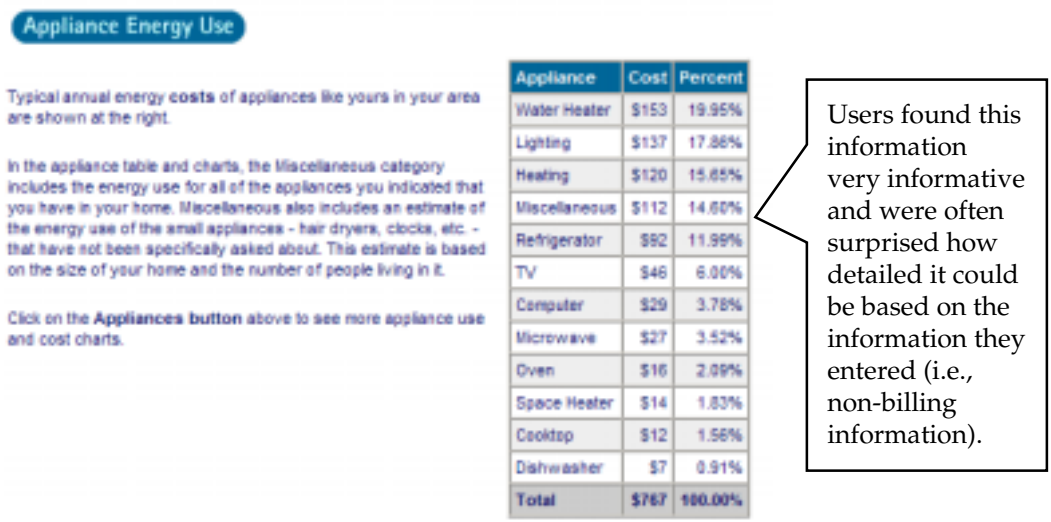
- Also, once selections were made to the "house" users had to click on "Update House" for the information to change. This went unnoticed by many, as users assumed this was occurring as soon as they made their selection.

- Some users also commented that information already entered (e.g., whether they had cooling in their home) was not retained in this more comprehensive audit, causing them to have to enter the information again.

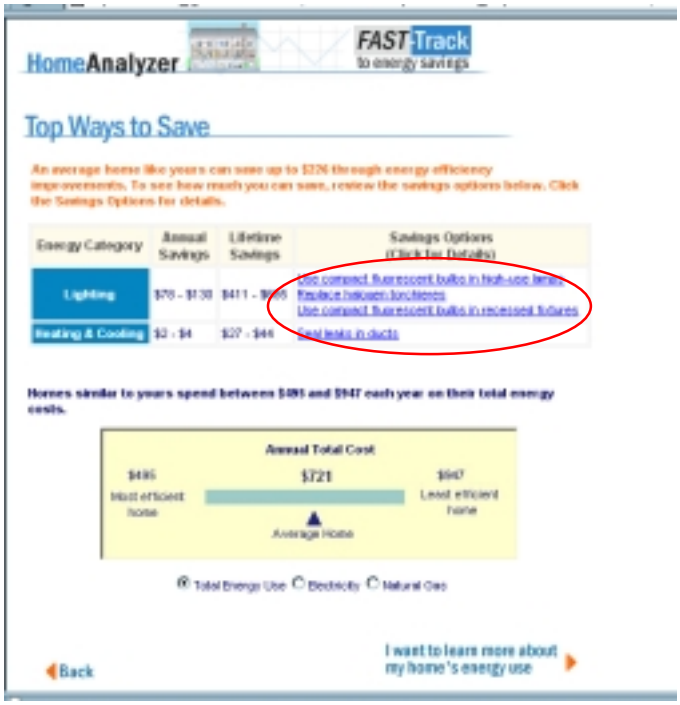
- At the same time, the top navigation changed to indicate navigation for the user. This new global navigation bar went virtually unnoticed by all users.



- Once users completed the form, they commented positively on the chart that shows costs by appliance.



- Users completing the Fast Track audit found this version to be far less valuable, particularly with regard to the recommendations. Specifically, many commented the tips offered were simply "common sense," and users said they would have to complete the full audit to receive the more comprehensive recommendations that were based on their specific home.



- Small business users experienced similar confusion with the energy analysis with regard to filling out the form. Users were surprised they needed to have their bills on hand to fill in some of the fields, and were not sure what they would receive after completing the entire form.

"Looks easy to use, but could – at beginning – have been more clear about what was needed to complete it (my bills) and what I would get at the end."

- While users from this segment were interested more in comparing their usage to other businesses with similar usage than residential users, they ran into more confusion with regard to terms and nomenclature. Specifically, several small business users were not sure what was meant by *Account Number,* not knowing whether it was their PG&E account number or the account number for logging into the site.

- A few business respondents also ran into obstacles during the audit as they were not sure how they were classified, or did not have an option to select that best fit their business type (e.g., "Large Warehouse").

Exhibit 3-4
Recommendations on Energy Usage Analysis

Severity	Issue Type (Strategic or Tactical)	Issue Area	Recommendation
4	Tactical	**Labeling/Nomenclature/ Content (Analyze Your Usage Landing Page)**	Rename links to allow users to clearly differentiate the differences of each link. Labels such as Home Energy Analysis Fast Track have no meaning to users, and specifically the term *analysis* implies to users they will be using their own billing data. Consider more descriptive labels such as "Comprehensive Home Energy Analysis down to the Appliance," and "Estimate your usage based on the size of your home".
4	Tactical	**Content**	Let users know ahead of time how specific the analysis will be through less text. Consider a tag-line approach after the label of each link. For example, *"Estimate your usage: - Simply enter the size of your home to see how your usage compares to others."* Make use of bulleted lists to indicate to users what they will need when completing each type of analysis. For example, "in order to complete this analysis, you will need to have handy the following: • Your most recent bill • The square footage of your home • Etc.
4	Tactical	**Content**	Include clear verbiage to let users know that the analysis/information provided are *estimates* based on minimal information entered, particularly for the more general analysis features of the site (e.g., Fast Track).
3	Tactical	**Content (Fast Track results page)**	Eliminate example graphics not relevant to individual user as they cause confusion, and hold little value. Rather, clearly alert users that the information presented is general based on little input, and entice them to want to learn more. Include verbiage such as "Want more detail? Click here to enter more specific information." Remember to let users know, however, which information they will need to have on hand to complete such detailed forms.
4	Tactical	**Navigation**	Include indication such as asterisk to let users know which fields are required to move forward.
3	Strategic	**Navigation/ Energy Audit**	Audit tool needs to incorporate a smoother transition from the Web site to the audit tool. Specifically, global navigational elements should be added to let the user know where they are both within the site, as well as within the audit process itself. For example… • Add interface that offers similar look and feel across top navigation (the labels are there, but the look and feel get lost within the tool, as the colors and layout of the links are light gray). Additionally, labels across top navigation bar need to be consistent throughout entire site. • Add a status bar at the top to let users know how far they are within the process and how much more they have to go. For example, "Step 1 of 3" coupled with a bar that shades in progressively lets users know they are almost finished.
5	Tactical	**Navigation/ Energy Audit**	Add functionality that automatically refreshes the house and calculations once user completes each section (inputs data for each appliance).

3	Tactical	**Layout/Design**	Change colors of information within forms so users clearly see drop down menus and choices (particularly in the audit tool). Alternately, eliminate (not just gray the text) options that are irrelevant to users.
4	Tactical	**Labeling**	Change Account Number field in business form to PG&E account number, and consider letting users know where they can find this number from their bill.
4	Tactical	**Content**	Add functionality that retains information user entered in other site tools (e.g., fast track). For example, is user indicated they did not have central air conditioning, auto fill this information in all other forms.
3	Strategic	**Content**	Recommendations made based on Fast Track audit should be more specific rather than general. At a minimum, clearly indicate to users that the recommendations serve as a reminder for general energy conservation and to find out more specific areas where they can save, they should complete the comprehensive audit.

3.2.3.3 Task: Locate Calculators

Users were told they needed to replace their air conditioning unit. In order to do so, they came to the Web site to determine what size to buy.

- Nearly all users began this task by clicking on *Step 3: Energy Saving Products.* A couple users thought they might find the calculators within the *Home Cooling* fact sheet. When the calculator was not found there, these users sometimes resorted to the site map or search function to locate the calculator.

- In contrast to focus group findings, users were receptive to the level of customization available with these calculators. Users in the usability study were far more interested in having the audit tools customizable (e.g., use their own billing data), but were willing to have more general calculator tools.

Users overall were pleased with the variety of calculators from which to choose, once they landed on this page.

- When finally completing the task, users described the calculator as easy to fill out and a useful tool.

"Energy calculators – how about that…it's easy to fill out…it's a good calculator."

Exhibit 3-5
Recommendations on Calculators

Severity	Issue Type (Strategic or Tactical)	Issue Area	Recommendation
3	Tactical	**Information hierarchy**	Calculators were considered a good resource to users and a reason to return to the site. Add more links to the calculators in areas of the site that make sense, such as within fact sheets.

3.2.3.3 Task: Locate Rebates

Users were told that some energy companies offer cash incentives (such as rebates) to customers who purchase new, specific energy-saving appliances, and asked to locate information about such rebates.

- Nearly all users began this task by exploring *Step 3 Energy Saving Products.* While users were eventually able to locate this area, most commented they did *not* expect to find rebates within the *Reduce Usage & Costs* area of the site. Users more often than not said they considered rebates to be part of *Step 3: Energy Saving Products,* as that is when they would be looking for a rebate (if they were searching for products).

"I think of rebates for appliances, not an electric company rebate."

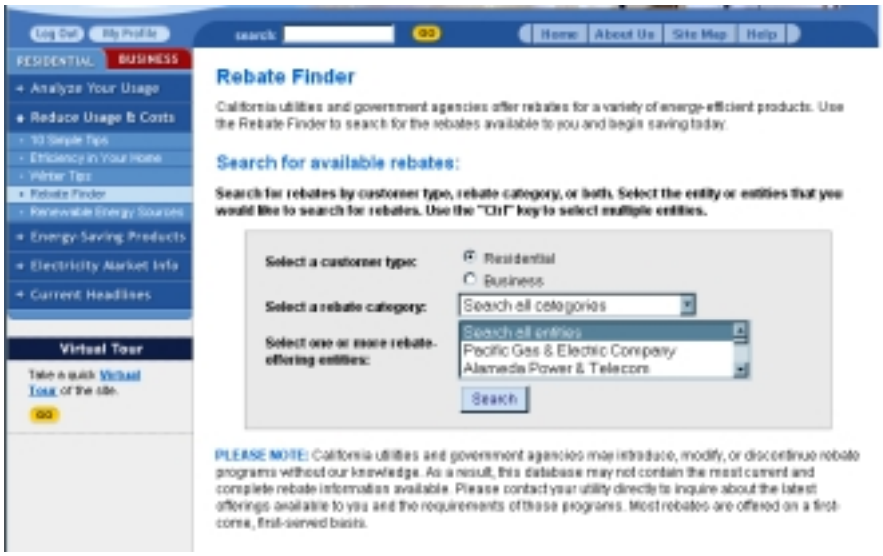
- Once users landed on the *Rebate Finder* main page, navigating the tool was easy for virtually all users; however, several users were unable to locate rebates based on simply entering an appliance. This caused some frustration for users, and they suggested showing *only* rebates that are indeed available so users do not have to search endlessly.

"If there was a window that had a list of all rebates available, versus searching and meeting an error."

"Usage and Cost refers to the amount of energy I'm using. A rebate isn't a reduction – it means someone else is paying. I would guess that incentives associated with products."

- Additionally, many users commented they considered rebates to be one of the more important areas of the Web site, and as such, should have its own link on the homepage. Focus group findings concluded the same.

"I want to see rebates really big"



- When searching for rebates, users were not always sure why they would see rebates in the results for utilities they are not customers of.

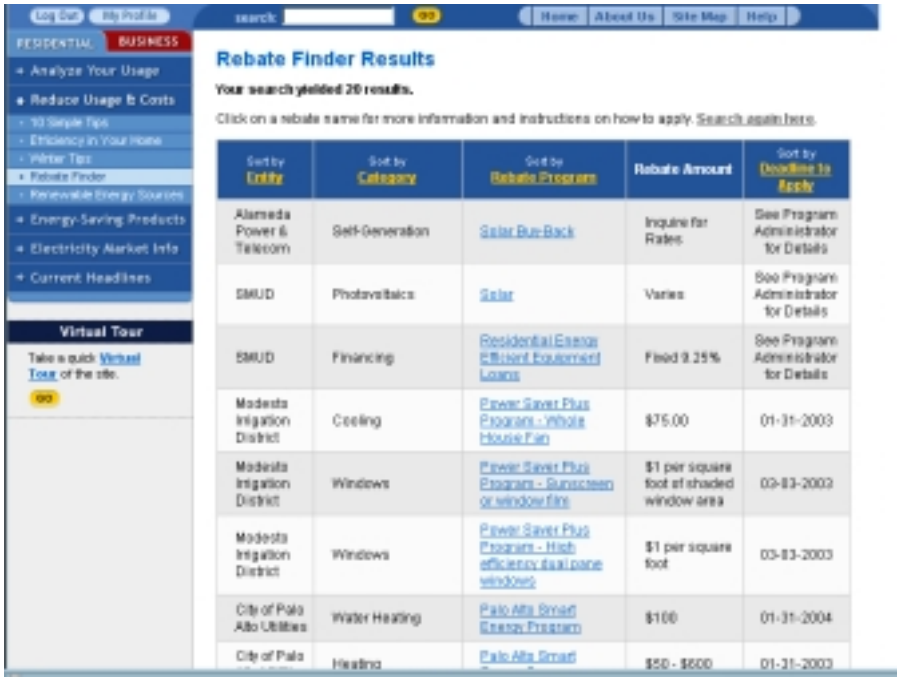


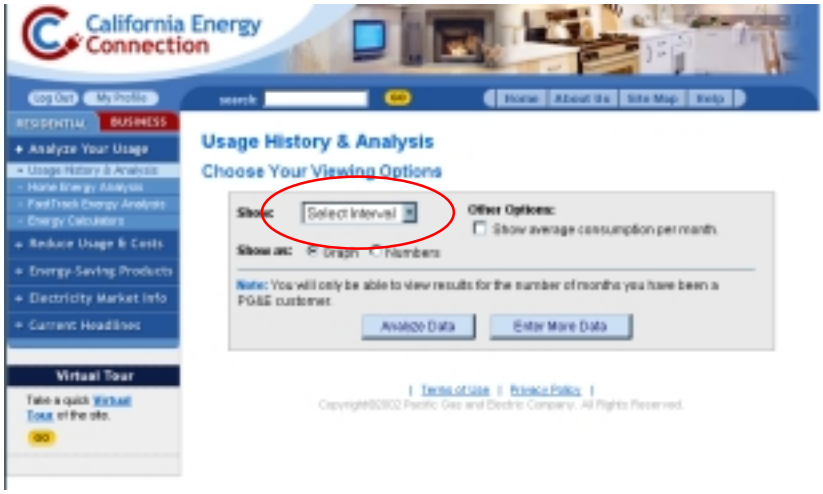
Exhibit 3-6
Recommendations on Rebate Information

Severity	Issue Type (Strategic or Tactical)	Issue Area	Recommendation
4	Tactical	**Information Hierarchy**	Include additional links to locate rebates throughout the site, in particular in the energy-savings product area. Add verbiage on homepage indicating to users this is a feature on the site as users considered this a key reason to return in the future.
4	Tactical	**Content**	Only show rebates for which user is eligible for (e.g., by zip code).
4	Strategic	**Content**	Since users consider the rebate finder a key reason to return to the site, consider leveraging this feature in areas that users are less receptive to. For example, consider moving the rebate finder to the Products landing page and including rebates as a benefit for registering with the site (e.g., "you can choose to be notified when a rebate becomes available for your home.")

3.2.3.4 Task: Usage History and Analysis

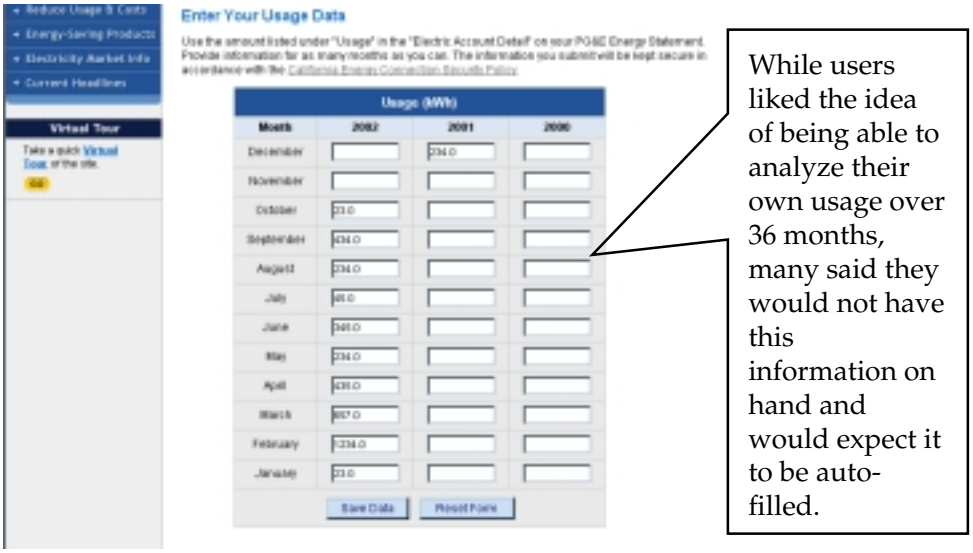
For the next task, users were told they were curious to see how their electricity usage had varied over the past year, on a monthly basis, and had heard they could come to this site to view this information.

- In completing this task, nearly all users began by clicking on the *Usage History and Analysis* link (Step 1). Users commented they expected to be able to enter their own PG&E account number to retrieve their information.



- Users were not always clear with terms used on this page (e.g., *Graph, Numbers)* or what those selections would result in, especially considering they did not enter personal information; however, it was intuitive to most how to navigate from the page.

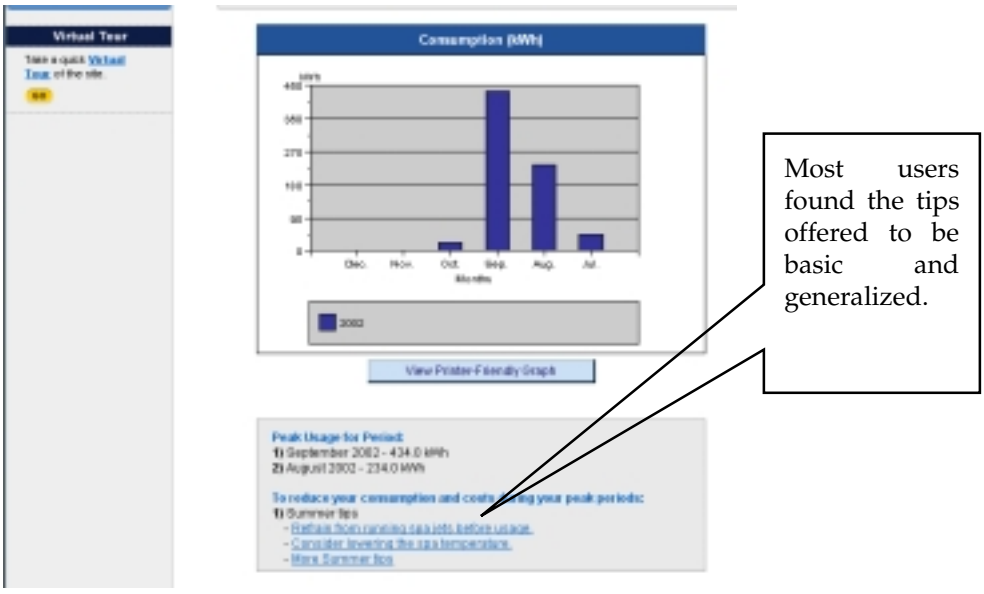
- Most users were pleasantly surprised when they landed on the second page allowing them to enter up to 36 months of billing information for their analysis; however, users frequently commented they were not warned that they would need to have all of this information on hand prior to landing on this page.



"I would like it if they call up my PG&E history for Usage History, doesn't look like they are sophisticated to do this, but it would be difficult to pull up all the bills with KWh."

"It's a database that's going to look at my usage, month by month…nice presentation of numbers."

"I expect my password would be linked to my account. It has to be linked somehow or why would I go in here. It surprises me it's not filled out – You have to fill this out yourself? So you just keep track of your own energy, it would save time just to come in and view. I wouldn't do this – too much book work."



- While users found the tool easy to use, the overall value of the tool was not realized by most. Users considered the graphs to be interesting, but said they would likely not

return if it meant they themselves had to maintain the data (by entering it on a monthly basis).

"I would think that most people wouldn't have this information on them – let's say they are at work, and they found the site. They won't have this information handy."

"I guess if you are willing to devote yourself to this, it would be a good tool. If you were just coming here once and sticking all these numbers in, I think it would be more trouble than it's worth."

- Finally, users questioned the overall usefulness of the tips offered as a result of this analysis, stating that the tips were generalized and not valuable. Some even wondered how such analysis could even be conducted since they had not entered enough information specific to their home.

Exhibit 3-7
Recommendations on Usage History and Analysis

Severity	Issue Type (Strategic or Tactical)	Issue Area	Recommendation
4	Tactical	**Labeling**	Provide more information to users before asking them how they would like to view the data (e.g., graph versus numbers). For example, provide users with a one sentence description of what the feature is.
4	Tactical	**Content**	Inform users upfront that in order to complete the analysis they will need to have handy past bills.
4	Strategic	**Content/Usage History**	Consider functionality that grabs user billing data from PG&E database so user does not have to keep track. (Note: This may also entice users to return to the site in the future, and to register.)
3	Tactical	**Content**	Provide users with more specific recommendations if possible, related to the unique data they have entered.

3.2.3.5 Task: Locate Manufacturer Page

Users were asked to locate information about different types of air conditioners or even manufacturers.

- Overall, this task was simple and straightforward for users to complete. Nearly all users went first to the Step 3: Energy-Saving Products, and navigated off that page by selecting the appliance.

- Interestingly, several respondents noted that manufacturers listed on the Web site were manufacturers "recommended" or endorsed by PG&E. Some users also thought that manufacturers pay PG&E to be listed on this Web site.

"I would assume the companies that are listed on page are the 'best' products since they are being endorsed by PG&E."

Exhibit 3-8
Recommendations on Manufacturer Page

Severity	Issue Type (Strategic or Tactical)	Issue Area	Recommendation
4	Tactical	**Content**	Add language to indicate manufacturers are not endorsed by PG&E, and that they do not pay a fee to be listed on the site. Consider letting users know how/why those listed are on the site (versus others).
4	Strategic	**Awareness**	Develop relationship marketing with manufactures to include links on their Web sites to the California Energy Connection Web site.

3.2.3.6 Task: My To Do List

Toward the end of the interview, respondents were asked for feedback regarding the *My To Do* area. Specifically, users were asked to talk about the overall purpose of that area, and whether they found it useful.

- Nearly all respondents did not notice this area on their own (without moderator prompting); however when prompted about the area, most users were clear on what its purpose was.

"It's things you've looked at, things in the main site you can add to it. You can pick the ones you want to look at and pop them up there."

- When probed about this area, respondents more often than not said they would not be inclined to use such an area, mostly due to the fact that they would not return to the site frequently enough to make such a feature worthwhile.

"Come back here? If this was a part of my job function I would come back to this."

- There were a few who liked the feature, however, and said if they were otherwise distracted from the computer, they liked having the ability to save information on the site.

"It's like the [checkout] basket, I could put stuff in here. There's a lot of information on site, if I'm distracted by something I can put it in here and come back to it later. The concept is a nifty feature."

Exhibit 3-9
Recommendations on My To Do List

Severity	Issue Type (Strategic or Tactical)	Issue Area	Recommendation
4	Tactical/Strategic	**Content**	Eliminate feature from the site – most users are not interested and do not consider it reason to return to the site.

3.2.3.7 Task: Virtual Tour

Time permitting, respondents were also asked to provide feedback on the virtual tour area of the Web site.

- Nearly all users said they thought this area was where they could go to view a virtual tour that included Web cameras – perhaps of a house or an office building. Under this assumption, respondents said they would be interested in and take the time to view such an area. Once the link was explored, however, and users noticed the area was a tour of the Web site itself, most said they would *not* take the time for this. This finding contrasts with those of the preliminary focus group findings where respondents liked the idea of the virtual tour.

"I usually like Web cams – in this site, maybe it is a virtual tour of sites… would be moving pictures of products. [User clicks on link] It looks like a virtual tour of the Web site…I never use these, I don't have the patience."

Exhibit 3-10
Recommendations on Virtual Tour

Severity	Issue Type (Strategic or Tactical)	Issue Area	Recommendation
4	Tactical/Strategic	**Content**	Eliminate feature from the Web site. Users were unclear what the feature offered, and even when explored commented they would be more likely to use a site map to view site content. Additionally, users in general explore sites by "trial and error," versus taking time to review virtual tours.

3.2.4 Overall Evaluation

At the end of each interview, users were asked several questions regarding their overall experience interacting with the Web site.

- All respondents interviewed considered the Web site useful, and commented they would be likely to return in the future. Interestingly, this finding contrasts with respondents from focus groups conducted previously where users said they would be unlikely to return to such a site. Feedback from this research indicates that the more users interact directly with the site using their personal information, the more they find value in the site (and will return). Furthermore, users are less interested in general information (such as information on the industry), and will not return solely for this type of information.

"Yes, [I would come back] to look up energy issues. I am not aware of other resources like this.

"I might come back for tips, then return to see them again."

"If I read something in the newspaper about something new, I would come back to check."

- Most users commented they thought the most useful parts of the site included the rebate/offers, *Ten Simple Tips,* and the analysis tools to help them save energy.

- The least preferred part of site for users was the information on the energy industry, as most commented they would not look to this site to become educated in that area (but rather their own news source).

- Upon completion of the usability interview, nearly all users said the Web site exceeded their expectations with regard to the functionality of the site, particularly the analysis tools; however, several users also commented they were disappointed their actual energy bill was not linked to the site.

"It's more useful than I first thought it would be. I thought it would be pretty generic, but some of the tools seem to be customized

"The site has met my expectations. It's comprehensive. It's a lot of information."

"This site is easier to use than the PG&E site…the PG&E homepage is more crowded."

- Additionally, users found the site well organized and easy to follow in terms, despite any obstacles during the tasks. Most commented the site was appealing aesthetically, with not too much 'flash.'

"I like blue colors…visually it is appealing."

- When probed about what they would change about the appearance of the site, some users commented that the site was text intensive and that many links seemed repetitive and redundant (e.g., left navigation bar and text on center of the page).

"I don't spend a lot of time reading on sites…for a business I would expect to go though and read, but for residential, I wouldn't want to spend a lot of time.

- In terms of information organization, several users commented they would reorganize the order of the steps on the homepage to Step 2, Step 3, and then Step 1, as it seemed like a more natural progression, especially after interacting with each area.

  "I think no one wants to organize their usage – I think they want to organize their budget."

- Responses were mixed regarding whether the information contained on the site was more trusted knowing PG&E was supporting the site, or whether the site was created by a third-party organization. Some users considered PG&E to be an organization that had a public interest in conserving energy, and were the most knowledgeable in the area of energy conservation; whereas others said they were more comfortable knowing the site was supported by a third-party as they would be more trust-worthy, and PG&E might be biased.

Exhibit 3-11
Overall Recommendations

Severity	Issue Type (Strategic or Tactical)	Issue Area	Recommendation
4	Strategic	**Marketing and Awareness**	Focus efforts on including interactive and customizable tools on the site that incent users to return. Results presented should be personalized to user based on information provided by the user. Focus on developing tools that will incent the users to return to the site.

3.3 CONCLUSIONS

High-level findings from usability testing are:

- **Users want results personalized to the information they provide**.

- **No respondents had been to the California Energy Connection Web site prior to the research.** Users suspected the Web site would contain textual information about energy efficiency.

- **Users were not entirely sure who sponsored the site**, and were mixed when asked whether having PG&E sponsor it would increase their trustworthiness of the information.

- **Overall, users found the California Energy Connection Web site informative and useful in terms of content**. Users were frequently surprised with the functionality of the

Web site, stating it was more interactive and useful than they had anticipated, based on the homepage (splash page).

- In addition, **users consistently navigated the Web site by using the three main navigational areas on the page (Step 1, 2, 3)**. Users were clear on what each area would offer them, with minor confusion about where to locate specific key links (e.g., Rebates).

- **By far, the area that caused the most confusion for users was the Login feature of the site**. Users were not clear why they would need to login on such a site, and many considered this requirement an obstacle to exploring the site further. In fact, users frequently commented that unless they knew why they would register on the site, they would most likely leave at this point.

- **Completing tasks on the site was mixed with both successes and failures.**
  - Audit Tools (Energy Analysis, Fast Track, Usage History and Analysis)
    - .. Users were unclear about the differences between the various audit tools (e.g., Fast Track versus Usage Analysis). Most considered these to be redundant.
    - .. Users found the home audit tool to be informative and useful, even thought many commented it was not specific enough.
    - .. Users were frequently disappointed with the generalness of the information presented to them after completing some of the audit tools, and said they considered that the tools would have value being customized to use their own billing/housing information. Often the recommendations given to users based on their input was considered to be general and non-specific.
    - .. Some nomenclature issues arose while filling out the energy analysis form (e.g., Account Number).
    - .. Forms have no indication of what information is required or not. Users are used to seeing a red asterisk next to the fields that are required so they will not be met when submitting incomplete forms.
    - .. Users needed to know in advance what information they would need to complete the forms – not midway through the process.
  - Users were able to easily locate information about products and manufactures from the homepage, often within 2-3 clicks.
  - The *Locate Rebate* feature was considered one of the most valuable tools on the Web site, although users had difficulty locating this tool.
  - The energy calculators were considered a valuable part of the Web site, although users had difficulty locating them.
  - Users easily located manufacturer information from the homepage quickly and with minimal clicks.

- **Most users said they would return to the site for additional information, particularly the rebate locator.** Users also said they would return to review their usage history over time, especially if they implemented any of the energy saving recommendations.

- **While users considered the *My To Do List* interesting, many said they were not sure they would return to the site frequently enough to take advantage of such a feature.**

- Users almost always thought the *Virtual Tour* was a tour of an efficient building or home (not of the site).

4. STAKEHOLDER INTERVIEWS

A series of 6 phone interviews were conducted with PG&E and Everse stakeholders, as part of the ongoing California Energy Connection Web site research being conducted by the Quantum Consulting and Socratic Technologies Team. These qualitative interviews (conducted January 10th – January 15th, 2003) were used to gain understanding of the current attitudes and perceptions of the project team members with regard to the development and purpose of the California Energy Connection Web site.

Four main areas of concentration were addressed during each interview: 1) the respondent's role in the Web site design and implementation process, 2) overall experience with the site's development, 3) opinions on how well Web site functions, and 4) plans for the next iteration. The responses to questions posed from each of these areas of concentration are summarized below.

4.1 ROLE IN THE PROCESS

Roles were divided along lines of responsibility, as defined by the organization the respondent worked for (PG&E or Everse) and his/her title and job function at that organization. Among the respondents were two program administrators, an attorney, a senior project manager, a program manager, a director, and a project manager.

When asked their responsibilities, most of the respondents noted that part of their work was to ensure that the Web site met the mandates set forth by the California Public Utilities Commission (CPUC). Throughout the interviews respondents indicated their awareness of these requirements and that these requirements were the genesis for the Web site.

In terms of daily responsibilities, most respondents noted that they were responsible for managing resources, including vendors and vendor contracts, internal resources, budgeting, and schedules.

Nearly all respondents stated that their overall job functions and responsibilities have remained constant, with any changes being due to the completion of the first iteration of the Web site. There are fewer "set-up" and more "maintenance" activities now that the project has reached its first year anniversary.

4.2 OVERALL EXPERIENCE

When asked what the overall objectives were at the project's inception, respondents replied "get information on how to reduce [energy] costs for consumers," "to fulfill the CPUC's mandates," "bring together a lot or resources and consolidate them in one place," and "help customers – give them information so they can conserve energy." The themes of the CPUC mandates and to encourage electricity customers to conserve were commonly heard during the interviews.

Expectations about working on the Web site team were generally positive. Respondents noted that having the objectives and goals of the Web site well delineated contributed to the easy organization and operation of the team. It was also noted by a few that the communication within the team was effective.

In terms of challenges faced with the project, a few were mentioned: presenting the content in a *"fresh"* and *"compelling"* manner, a tight timeframe for producing the mandated Web site, managing vendors, lack of feedback about the Web site from decision-makers, and technical issues designing the Web site. Respondents did not classify these challenges as insurmountable, but rather as expected obstacles.

4.3 WEB SITE FUNCTIONALITY

Nearly all respondents reported that the Web site meets all the requirements set by the regulatory requirement. Additionally, several respondents perceive the Web site as being an experiment to test the requirements for providing an online resource and educating the public. Respondents feel that the Web site has been constructed as a channel to promote energy conservation (as specified by the mandate), but customer response to the effort will be the test of its effectiveness. A couple also noted that the Web site *"works as designed"* -- the implementation accurately reflects the specifications.

When asked about any perceived "weaknesses," respondents reported a few: more personalization of the energy data is needed, the look and feel of the tools should be more seamlessly integrated, the site is too *"static, "* and the Web site should be more intuitive. The most frequently noted weakness was the need for more personalization; that users should be able to have their energy usage data imported into the site's functions.

While respondents do feel that the Web site meets the objectives of the project, several note that they originally expected more functionality of the provided tools. It was reported that time and resource constraints limited the amount of complexity added to the site.

4.4 PLANS FOR THE NEXT ITERATION

For the 2003 development cycle, respondents commented on several *"enhancements"* or changes to the Web site. Most of these are to buttress the perceived weaknesses, as discovered through internal evaluations and market research, most specifically the usability research with customers. Primarily, respondents state that *"more individualized"* data should be included on the site. Users should be able to *"sign in and see [their] aggregated information,"* including *"billing analysis," "usage histories,"* and *"personalization."* Also noted was that the tools should be more fully integrated, e.g. *"inputting a ZIP code should tell the rebate finder which ones are applicable."*

Although according to respondents the mandated objectives have been met, improvement of the site's functions and data set are needed to promote return visits. More specific and updated personalized energy usage data will attract repeat visitors. Also, reducing the amount of "digging for information" may entice users to return. Finally, a few respondents also noted that awareness of the Web site needs to be increased. It was mentioned that awareness could be increased through e-mail campaigns and tie-ins to other energy Web sites.

5. QUANTITATIVE WEB SURVEY RESULTS

As part of the evaluation of the California Energy Connection Web site, PG&E undertook a quantitative survey of site users and non-users. The objectives of this portion of the research were:

- Understand user reaction to various parts of the site
- Determine how often and which areas users had visited
- Measure the influence of the site in adoption of energy efficiency measures
- Understand level of awareness of the Web site among non-users
- Determine which energy efficiency measures have been adopted by non-users
- Measure interest in a Web site devoted to energy efficiency

To meet these research objectives, an online survey was conducted with 376 respondents. Respondents were classified into four groups as shown in the table below.

	User	**Non-User**	**Total**
Residential	70	150	220
Business	6	150	156
Total	76	300	376

The survey was conducted between January 17 and January 30, 2003. Socratic Technologies programmed and hosted the survey.

Site users were invited by email to participate in the survey. Users' email addresses were obtained from registration records on Californiaenergyconnection.com. Non-users were drawn from an opt-in online research panel and were contacted by email to participate. Non-users were drawn from zip codes within PG&E's service territory.

This section presents findings from the online survey. Program impact analysis is addressed in the following section of this report.

5.1 DEMOGRAPHICS

5.1.1 Internet/Web Usage

Most Users considered themselves to be beginners when using the Internet or Web (62%). Almost half (49%) of Non-Users considered themselves to be of intermediate Internet or Web expertise. Residential Non-Users considered themselves to be of intermediate Internet or Web expertise (53%), while Residential Users considered themselves to be beginners (61%). This is expected because non-user respondents were recruited from an opt-in online research panel, where one typically sees greater facility with the Internet than in the general population. (See Exhibit 5-1-1)

Users and Non-Users both participated in sending email online more than any other activity, on a daily basis (90%, 95%, respectively). Researching information also ranked high as an online activity, with Users and Non-Users participating almost equally on a daily basis (58%, 59%, respectively). (See Exhibit 5-1-2)

Exhibit 5-1-1
Level of Expertise When Using the Internet or Web
Bold indicates significant difference at 95% confidence level

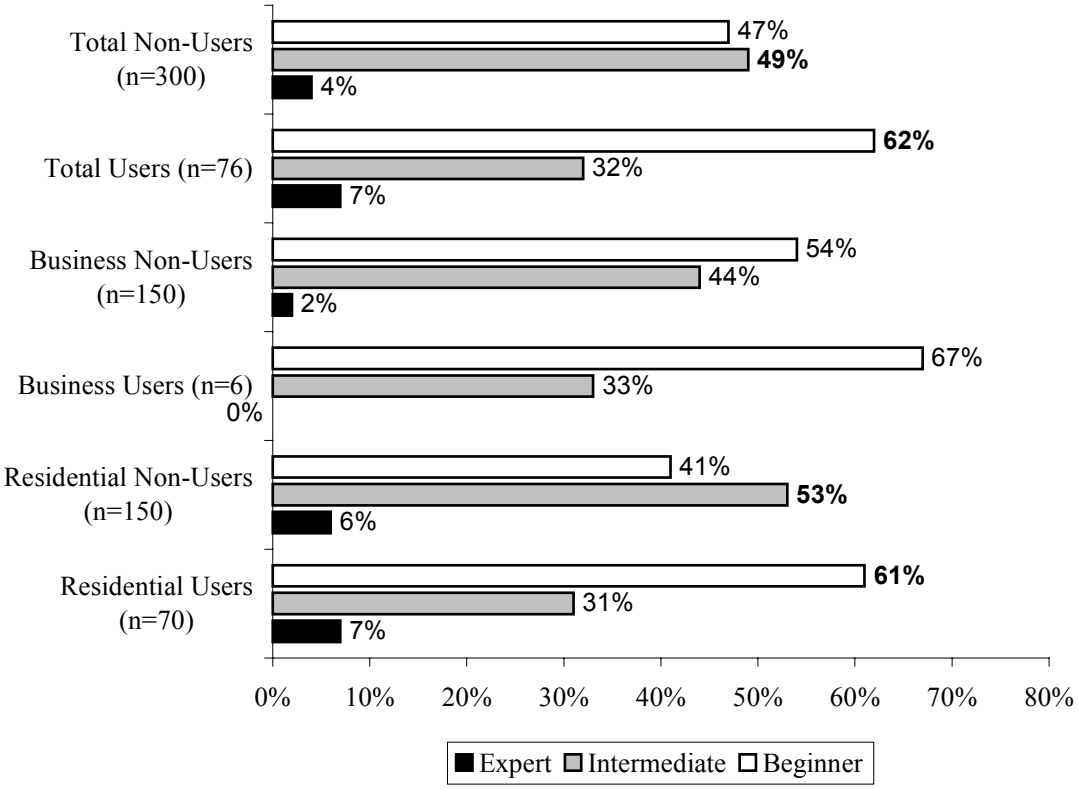


Exhibit 5-1-2
Frequency of Web-Based Activities

Online Activities	Never	A few times a year	A few times a month	A few times a week	Daily
Purchase or Pay Bills					
Residential Users (n=70)	16%	7%	46%	20%	11%
Residential Non-Users (n=150)	27%	11%	38%	19%	5%
Business Users (n=6)	33%	0%	67%	0%	0%
Business Non-Users (n=150)	13%	12%	43%	17%	15%
Total Users (n=76)	17%	7%	47%	18%	11%
Total Non-Users (n=300)	20%	12%	40%	18%	10%
Research Information					
Residential Users (n=70)	0%	3%	10%	29%	59%
Residential Non-Users (n=150)	1%	3%	8%	37%	50%
Business Users (n=6)	0%	0%	17%	33%	50%
Business Non-Users (n=150)	1%	1%	7%	23%	67%
Total Users (n=76)	0%	3%	11%	29%	58%
Total Non-Users (n=300)	1%	2%	8%	30%	59%
Travel Planning					
Residential Users (n=70)	0%	59%	29%	9%	4%
Residential Non-Users (n=150)	13%	61%	15%	7%	5%
Business Users (n=6)	17%	83%	0%	0%	0%
Business Non-Users (n=150)	4%	63%	20%	7%	6%
Total Users (n=76)	1%	61%	26%	8%	4%
Total Non-Users (n=300)	9%	62%	17%	7%	5%
Banking					
Residential Users (n=70)	14%	13%	26%	24%	23%
Residential Non-Users (n=150)	33%	7%	25%	23%	12%
Business Users (n=6)	50%	0%	33%	0%	17%
Business Non-Users (n=150)	25%	10%	14%	24%	27%
Total Users (n=76)	17%	12%	26%	22%	22%
Total Non-Users (n=300)	29%	9%	19%	23%	20%
Buy or Sell Stocks					
Residential Users (n=70)	50%	24%	20%	3%	3%
Residential Non-Users (n=150)	69%	21%	6%	2%	3%
Business Users (n=6)	83%	0%	0%	17%	0%
Business Non-Users (n=150)	54%	27%	15%	1%	3%
Total Users (n=76)	53%	22%	18%	4%	3%
Total Non-Users (n=300)	61%	24%	10%	2%	3%

Online Activities	Never	A few times a year	A few times a month	A few times a week	Daily
Send Electronic Postcards					
Residential Users (n=70)	29%	46%	23%	1%	1%
Residential Non-Users (n=150)	15%	37%	30%	13%	5%
Business Users (n=6)	17%	50%	33%	0%	0%
Business Non-Users (n=150)	12%	37%	33%	12%	7%
Total Users (n=76)	28%	46%	24%	1%	1%
Total Non-Users (n=300)	14%	37%	31%	12%	6%
Email					
Residential Users (n=70)	1%	1%	0%	9%	89%
Residential Non-Users (n=150)	0%	0%	1%	4%	95%
Business Users (n=6)	0%	0%	0%	0%	100%
Business Non-Users (n=150)	0%	1%	1%	4%	95%
Total Users (n=76)	1%	1%	0%	8%	90%
Total Non-Users (n=300)	0%	<.5%	1%	4%	95%

5.1.2 Age

Median age range was between 35 and 44 years for all User and Non-User groups, except for Business Users, whose median age range was 45-54.

Exhibit 5-1-3
Age

	Median	Under 18	18-24	25-34	35-44	45-54	55-65	Over 65	Prefer not to say
Residential Users (n=70)	**35-44**	0%	0%	19%	34%	23%	16%	4%	4%
Residential Non-Users (n=150)	**35-44**	0%	6%	22%	27%	21%	14%	9%	1%
Business Users (n=6)	**45-54**	0%	17%	17%	0%	17%	33%	0%	17%
Business Non-Users (n=150)	**35-44**	0%	1%	24%	23%	37%	11%	3%	1%
Total Users (n=76)	**35-44**	0%	1%	18%	32%	22%	17%	4%	5%
Total Non-Users (n=300)	**35-44**	0%	4%	23%	25%	29%	13%	6%	1%

5.1.3 Educational Background

Users in general appeared to be educated at higher levels than Non-Users. More Users attended Graduate School (37%) than Non-Users (18%). More Residential Users attended Graduate School (37%) and College (39%) than Residential Non-Users (21% and 23%, respectively).

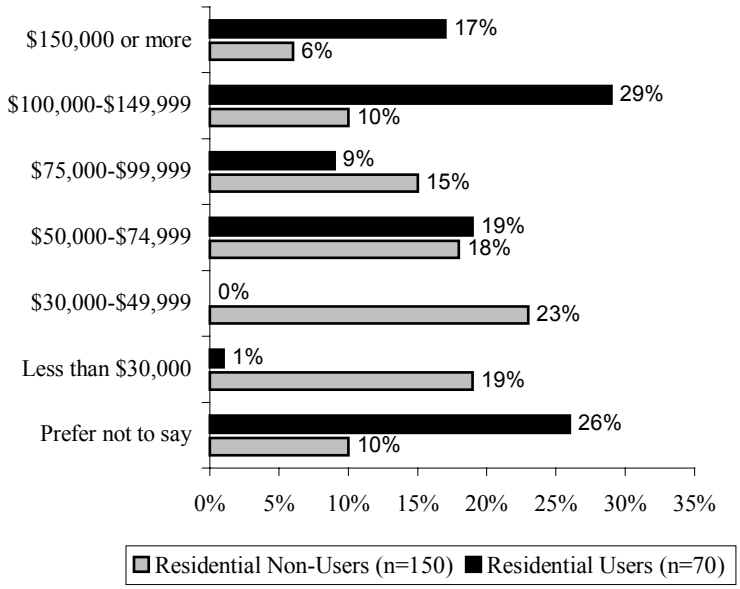
Exhibit 5-1-4
Education
Bold indicates significant difference at 95% confidence level.

	Elementary School	Some High School	Graduated High School	Trade or Technical School	Some College	Graduated College	Graduate School	Prefer Not to Say
Residential Users (n=70)	0%	0%	4%	6%	13%	**39%**	**37%**	1%
Residential Non-Users (n=150)	0%	0%	**14%**	5%	**37%**	23%	21%	0%
Business Users (n=6)	17%	0%	17%	0%	33%	0%	33%	0%
Business Non-Users (n=150)	0%	0%	6%	8%	22%	49%	15%	1%
Total Users (n=76)	1%	0%	5%	5%	15%	36%	**37%**	1%
Total Non-Users (n=300)	0%	0%	10%	7%	**29%**	36%	18%	<.5%

5.1.4 Residential User Profile

Residential Users had the highest annual household income, as 29% earned between $100,000 and $149,999 per year, and 17% earned $150,000 or more per year. Residential Non-Users were in far lower income brackets, as 23% earned between $30,000 and $49,999 per year and 19% earned less than $30,000 per year. Median income range for Residential Users was between $100,000 and $149,999 and for Residential Non-Users between $50,000 and $74,999.

Exhibit 5-1-5
Annual Household Income



Most Residential Users (91%) and Residential Non-Users (68%) lived in single family homes. This is expected, since those who own their home have more interest in controlling energy consumption.

Exhibit 5-1-6
Description of Home

	Residential Users (n=70)	Residential Non-Users (n=150)
Single Family Home	91%	68%
Apartment or condo in building with 4 or fewer units	1%	5%
Apartment or condo in building with more than 4 units	4%	17%
Townhome	3%	2%
Trailer/mobile home	0%	6%
Other	0%	1%

5.2 SOURCES OF AWARENESS AND SPONSORSHIP

More than one-third of Users (34%) became aware of Californiaenergyconnection.com through a notice sent via mail. Nearly 1 in 5 became aware of the Web site through PG&E's Web site.

Exhibit 5-2-1
Sources of Awareness

	Residential Users (n=70)	Business Users (n=6)	Total Users (n=76)
Received notice in mail	33%	50%	34%
Printed on utility bill	16%	0%	15%
PGE.com	17%	17%	17%
Internet search engine	7%	0%	7%
A print advertisement	3%	33%	5%
A link or banner ad on another Web site	3%	0%	3%
A friend, colleague or family member recommendation	1%	0%	1%
Other	4%	0%	4%
I'm not sure/Don't remember	16%	0%	15%

Awareness of Pacific Gas & Electric being the sponsor of the Web site was 42% among Users. Just over one-half of respondents believed that the State of California sponsored the site.

Exhibit 5-2-2
Sponsorship Awareness

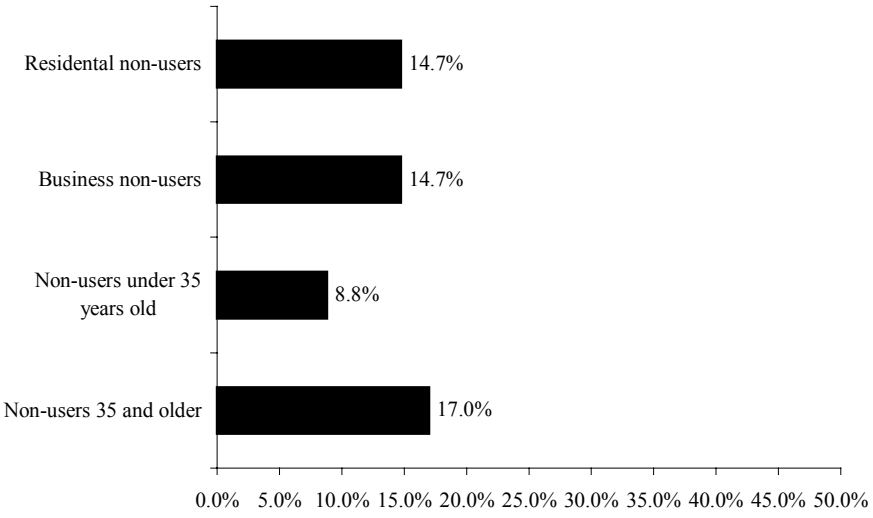
	Residential Users (n=70)	Business Users (n=6)	Total Users (n=76)
Pacific Gas & Electric	41%	50%	42%
California Public Utility Commission	31%	17%	30%
The State of California	20%	33%	21%
Manufacturers of appliances or industrial equipment	3%	0%	3%
A consumer watchdog group	1%	0%	1%
A for-profit energy services company	1%	0%	1%
Southern California Edison	0%	0%	0%
San Diego Gas & Electric Company	0%	0%	0%
Someone else	1%	0%	1%

5.3 NON-USERS

5.3.1 Website Awareness

Approximately 1 in 7 respondents were aware of the Web site. The proportion was the same for residential and business non-users. Older respondents were more likely to be aware of the site than were younger respondents. Nearly 1 in 5 respondents age 35 and older were aware of the site, while only 1 in 12 of those younger than 35 were aware of the Web site.

Exhibit 5-3-1
Awareness of Californiaenergyconnection.com
Percent aware



Respondents who were aware of the Web site more strongly agreed with several statements about energy efficiency than did those who were unaware of the Web site. The observed differences suggest that those who are aware of the Web site tend to be those who are more generally attuned to energy efficiency.

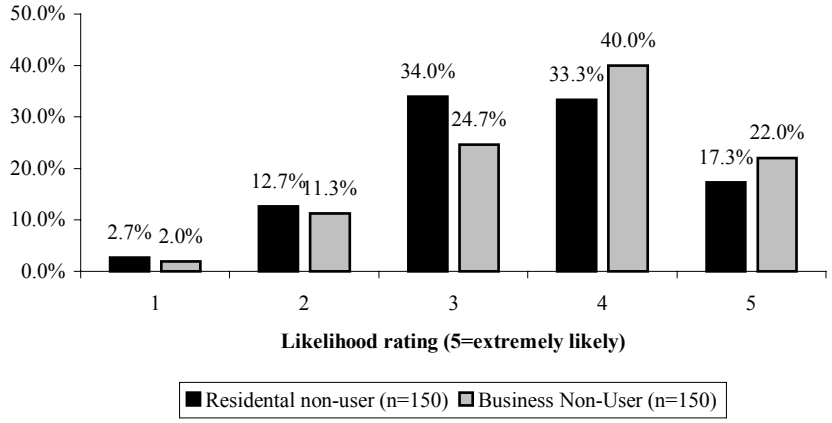
Exhibit 5-3-2
Energy Efficiency Attitudes Among those Aware and Unaware of Californiaenergyconnection.com.
Mean agreement on a 5-point scale.
Bold indicates significant difference at 95% confidence level.

	Aware of Site	Unaware of Site
Credible information about saving energy is easy to find	3.68	3.58
I am well-informed about how to save energy in my home or business	**4.30**	4.00
I am aware of information about energy efficient products offered by manufacturers	**4.27**	4.00
All this conservation stuff is just common sense	3.57	3.76
I've known all this conservation stuff for a long time	**4.09**	3.74
PG&E is a useful source of energy efficiency information	3.95	3.75
Media coverage of the energy crisis in the last year made me use energy more carefully	3.39	**3.75**

5.3.2 Likelihood of Visiting Energy Efficiency Web Sites

Respondents were asked how likely they were to visit a Web site where they could get customized energy efficiency recommendations, energy-saving tips, and learn about rebates and energy saving products. One-half of residential non-users and nearly two-thirds of business non-users said they would likely visit such a site.

Exhibit 5-3-3
Likelihood to Visit Energy Efficiency Web Site



There were differences in energy efficiency attitudes between those who were likely to visit an energy efficiency Web site and those who were not. Most notably, media coverage of the

energy crisis in California appears to have driven people be more conscious of energy efficiency.

Exhibit 5-3-4
Energy Efficiency Attitudes Among those Aware and Unaware of Californiaenergyconnection.com.
Mean agreement on a 5-point scale. Bold indicates significant difference at 95% confidence level.

	Likely to Use	Unlikely to Use
Credible information about saving energy is easy to find	3.62	3.56
I am well-informed about how to save energy in my home or business	4.05	4.04
I am aware of information about energy efficient products offered by manufacturers	4.06	4.02
All this conservation stuff is just common sense	3.71	3.76
I've known all this conservation stuff for a long time	3.67	**3.95**
PG&E is a useful source of energy efficiency information	**3.91**	3.61
Media coverage of the energy crisis in the last year made me use energy more carefully	**3.86**	3.48

5.3.3 Sources of Energy Efficiency Information

When asked where they would look if they wanted to find information on reducing energy usage, Residential Non-Users and Business Non-Users most often mentioned online sources, such as Internet search engines. This suggests that the best way to communicate information regarding energy efficiency is online. The PG&E Web site was also chosen by 21% of Business Non-Users and by 18% of Residential Non-Users. Overall, 76% of non-users mentioned an online source for energy efficiency information.

The Web site was mentioned by 3% of Non-Users as a source of energy efficiency information. This, combined with the 15% awareness of the Web site, suggests that non-users are likely not aware of the content at the Web site.

Exhibit 5-3-5
Sources of Energy Efficiency Information

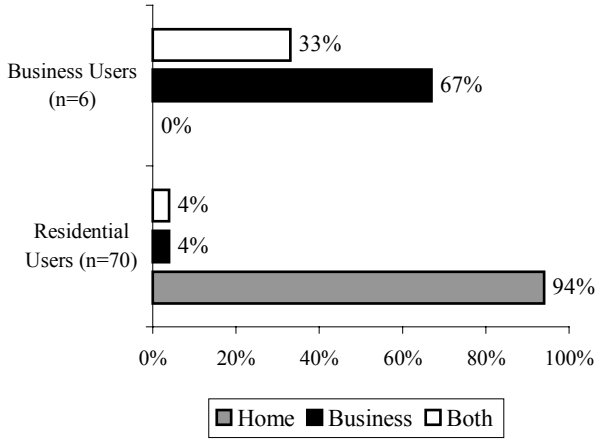
	Residential Non-Users (n=144)	Business Non-Users (n=149)	Total Non-Users (n=293)
Online/internet/search engine/Yahoo/Google	49%	54%	52%
PG&E Web site	21%	21%	21%
Utility bill/stuffers/flyers included with bill	6%	3%	4%
Call PG&E/contact a PG&E representative	3%	7%	5%
californiaenergy.com/californiaenergyconnection.com	2%	3%	3%
My local utility/electric company	8%	6%	7%
Library	3%	2%	2%
PG&E (non-specific)	16%	17%	16%
SCE/Edison	5%	1%	3%
Energy consumption/usage/related Web sites	8%	5%	7%
SMUD	1%	3%	2%
Phone book/Yellow Pages	4%	1%	1%
Other	15%	9%	9%
Don't know	3%	1%	1%
I wouldn't look anywhere/no interest	1%	1%	1%

5.4 USER EXPERIENCE

5.4.1 Home vs. Business Use

Most all Residential Users came to the Web site to seek information for their home (94%), while Business Users came to the site for both business (67%) and home (33%) information.

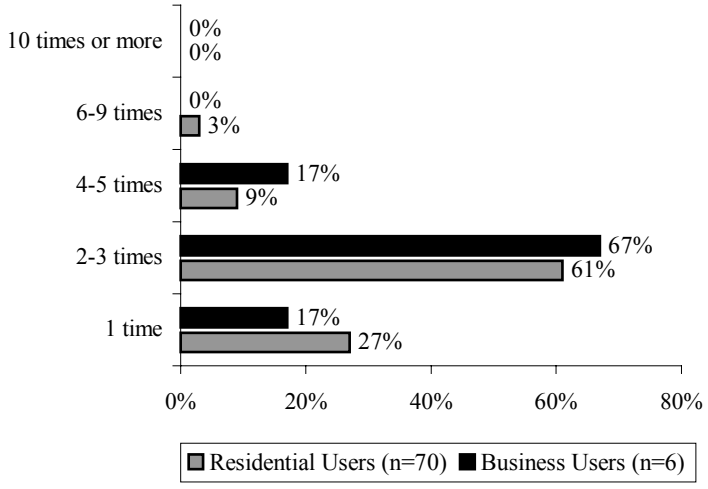
Exhibit 5-4-1
Home vs. Business Use



5.4.2 Frequency of Visits to the Web site

Business and Residential Users were closely matched with regard to the number of visits to the Web site, as 67% of Business Users and 61% of Residential users visited the site between two and three times.

Exhibit 5-4-2
Frequency of Visits to Californiaenergyconnection.com



5.4.3 Reasons for Visiting Californiaenergyconnection.com

Getting tips on energy savings was the most frequently cited reason given by Users (67%) for visiting the Web site, but looking at energy usage history was the most important reason for visiting the site (24%).

Exhibit 5-4-3
Reasons for Visit vs. Most Important Reason

	Reasons			Most Important Reason		
	Residential Users (n=70)	Business Users (n=6)	Total Users (n=76)	Residential Users (n=70)	Business Users (n=6)	Total Users (n=76)
Look at my energy usage history	51%	83%	54%	21%	50%	24%
Get an energy analysis	47%	50%	47%	14%	17%	15%
Use energy calculators to see the costs of various appliances	41%	17%	40%	9%	0%	8%
Get tips on energy savings	57%	50%	67%	17%	0%	16%
Look for rebate opportunities	49%	67%	50%	10%	33%	12%
Find out about renewable energy sources	14%	0%	13%	3%	0%	3%
Learn about energy-saving products	44%	50%	45%	6%	0%	5%
Get information about the California energy market	11%	0%	11%	0%	0%	0%
See current news about energy	13%	0%	12%	0%	0%	0%
Receive a free gift from The Home Depot®	46%	67%	47%	19%	0%	17%
Other, please specify	3%	0%	3%	1%	0%	1%

5.4.4 Most/Least Visited Areas of Californiaenergyconnection.com

The most visited area of the Web site for one-time visitors was getting tips on energy savings (90%). This was also true for return visitors (95%). There was little interest in California energy market information among site visitors, regardless of how many times they have visited the site. Return visitors were much more likely to have looked for rebates than one-time visitors.

In general, return visitors have visited more areas of the Web site than one-time visitors.

Exhibit 5-4-4
Most/Least Visited Areas of Californiaenergyconnection.com

	One-Time Visitors (n=20)		Return Visitors (n=56)	
	Visited	Not Visited	Visited	Not Visited
Look at my energy usage history	70%	30%	82%	18%
Get an energy analysis and custom savings recommendations	80%	20%	75%	25%
Use energy calculators to see the costs of various appliances	80%	20%	84%	16%
Get tips on energy savings	90%	10%	95%	5%
Look for rebate opportunities	65%	35%	82%	18%
Find out about renewable energy sources	75%	25%	71%	29%
Learn about energy-saving products	75%	25%	93%	7%
Get information about the California energy market	65%	35%	64%	36%
See current news about energy	75%	25%	62%	38%

5.4.5 Visibility of Areas Not Visited on Californiaenergyconnection.com

Energy saving tips was the most used and most visible area of the site. Ninety-five percent of site visitors either used or visited that area of the site. Information about the California energy market was the least used and least noticed area of the site.

We calculated an "Attractiveness Ratio" for each site area. This ratio is calculated as the percent using divided by the percent noticing but not using. It is intended to be a measure of how attractive the site was to visitors by quantifying the extent to which people who were aware of its existence used it. A higher ratio implies that the area is more attractive.

Using this ratio, we see that the energy tips were by far the most attractive area of the site. This is not surprising because this area provided relevant information to users while requiring little effort on their part. Energy calculators and rebate opportunities were the next two most attractive areas of the site.

The energy analysis area of the site scored low on this ratio because of the large amount of effort required of the user to complete the area, even though it has the potential to provide relevant, beneficial information to the user. The two lowest scoring areas in terms of attractiveness were energy news and CA energy market information. This is not surprising, as this information has little to no relevance to a large majority of the population.

Exhibit 5-4-5
Visibility of Areas Not Visited on Californiaenergyconnection.com

	Did Not Notice		
	Residential Users (n=70)	**Business Users (n=6)**	**Total Users (n=76)**
Get information about the California energy market	24%	33%	25%
See current news about energy	21%	33%	22%
Find out about renewable energy sources	20%	50%	22%
Look for rebate opportunities	20%	0%	18%
Use energy calculators to see the costs of various appliances	13%	33%	15%
Get an energy analysis	11%	33%	13%
Look at my energy usage history	13%	17%	13%
Learn about energy-saving products	6%	0%	5%
Get tips on energy savings	4%	17%	5%

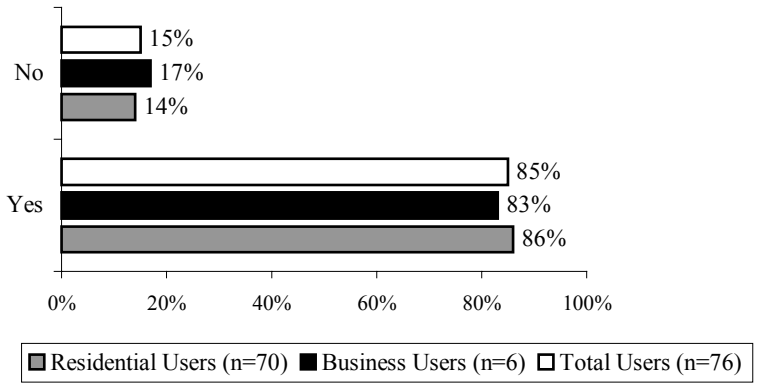
Exhibit 5-4-6
Summary of Areas Visited on Californiaenergyconnection.com
Percent of Users who used, noticed, and did not notice site areas

	Used (n=76)	Noticed But Did Not Use (n=76)	Did Not Notice (n=76)	Attractiveness Ratio
Get tips on energy savings	94%	1%	5%	94
Learn about energy-saving products	88%	7%	5%	12.6
Use energy calculators to see the costs of various appliances	82%	3%	15%	27.3
Look at my energy usage history	79%	8%	13%	9.9
Look for rebate opportunities	78%	4%	18%	19.5
Get an energy analysis	76%	11%	13%	6.9
Find out about renewable energy sources	73%	5%	22%	14.6
See current news about energy	66%	12%	22%	5.5
Get information about the California energy market	64%	11%	25%	5.8

5.4.6 Intention to Return to Californiaenergyconnection.com

The majority of Business and Residential Users intended to visit the Web site in the future. The actual proportion who have visited the site more than one time was 75%, suggesting that there is a reasonable correlation between stated intent and behavior in this case.

Exhibit 5-4-7
Intention to Return to Californiaenergyconnection.com



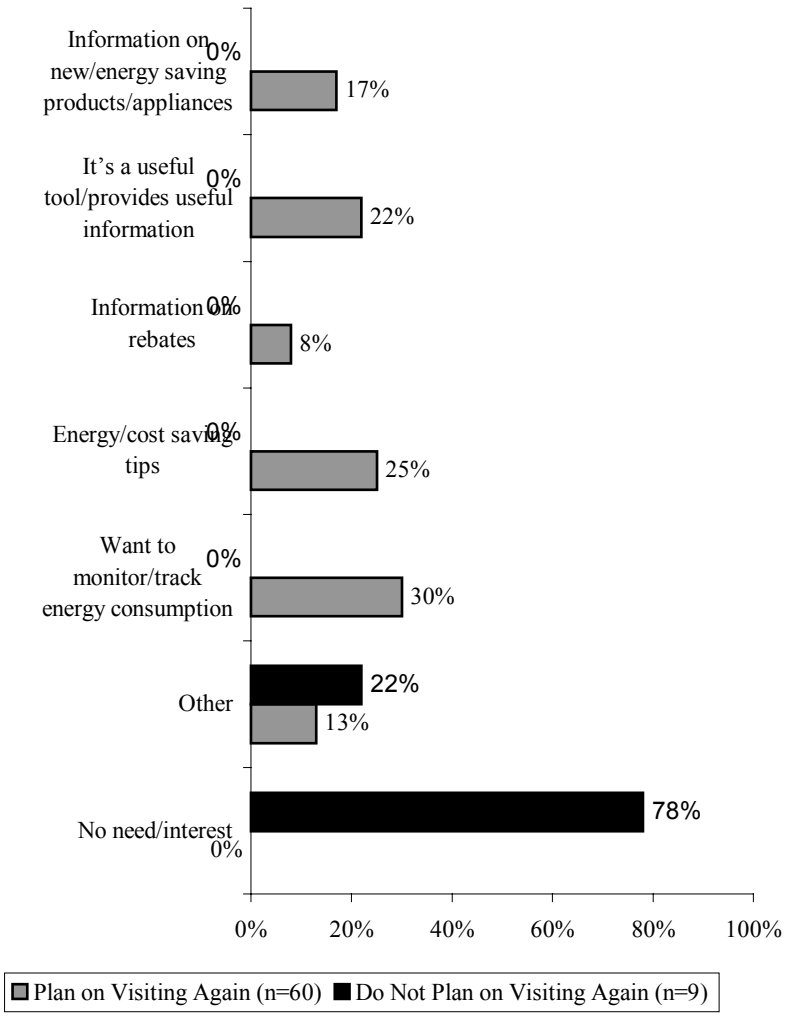
Looking at energy usage history, rebate opportunities, tips on energy savings and energy analysis rated high as potential future visits to the Web site by Users.

Exhibit 5-4-8
Areas of Californiaenergyconnection.com Intended for Future Visits by Users

	Residential Users (n=70)	Business Users (n=6)	Total Users (n=76)
Look at my energy usage history	76%	80%	77%
Look for rebate opportunities	77%	100%	79%
Get tips on energy savings	63%	80%	65%
Get an energy analysis	62%	60%	62%
Learn about energy-saving products	60%	20%	57%
Use energy calculators to see the costs of various appliances	55%	60%	55%
Find out about renewable energy sources	37%	20%	35%
Get information about the California energy market	25%	0%	23%
See current news about energy	23%	20%	23%
Not sure	1%	0%	1%

Respondents who plan on visiting the Web site again in the future said they will do so to monitor or track energy consumption (30%) or to find energy/cost saving tips (25%). They also found the Web site to be a useful tool for information. Those who do not plan on visiting Californiaenergyconnection.com in the future say they won't because they have no need or interest (78%).

Exhibit 5-4-9
Reasons for Intended Return to Californiaenergyconnection.com



5.5 USABILITY

5.5.1 Ease of Use

Users of the Web site found the site to be somewhat easy to use. These scores suggest that the Web site is comparable to many other sites in terms of ease of use.

Exhibit 5-5-1
Ease of Use for Californiaenergyconnection.com Features
Mean rating on a 5-point scale where 5 means "very easy."

	Residential Users (n=70)		*Business Users (n=6)*		*Total Users (n=76)*	
	Rating	Sample Size	Rating	Sample Size	Rating	Sample Size
Look at energy usage history	3.84	55	4.40	5	3.88	60
Get an energy analysis	3.75	56	4.50	2	3.78	58
Use energy calculators to see the costs of various appliances	3.78	60	4.67	3	3.83	63
Get tips on energy savings	3.92	66	4.00	5	3.93	71
Look for rebate opportunities	3.91	53	4.00	6	3.92	59
Find out about renewable energy sources	3.63	52	4.33	3	3.67	55
Learn about energy-saving products	3.93	61	3.83	6	3.93	67
Get information about the CA energy market	3.60	45	3.50	4	3.59	49
See current news about energy	3.62	47	3.33	3	3.60	50

5.5.2 Opinions Regarding Californiaenergyconnection.com

When asked about various aspects of the site, users rated the site highest on overall usefulness. They also indicated that they would be likely to recommend the site to others. While users believed that the information presented was credible, the data suggests that the site is less effective at actually influencing behavior. This can be seen in the relatively low agreement with the statements "Overall, the Web site was helpful in getting me to manage my energy use, " and "This Web site was helpful in getting me to make decisions regarding purchasing energy-efficiency equipment."

Exhibit 5-5-2
Opinions About Californiaenergyconnection.com Features
Mean agreement on a 5-point scale where 5 means "strongly agree."

	Residential Users	*Business Users*	*All Users*
	N = 70	N = 6	N = 76
This Web site is interesting	3.86	3.50	3.83
This Web site is easy to navigate	3.71	3.33	3.68
This Web site is hard to understand	2.24	3.00	2.30
This Web site looks appealing	3.83	3.33	3.79
This Web site is useful to me	4.04	3.83	4.03
This Web site loads quickly and easily	3.84	4.00	3.86
I would recommend this site to others	3.94	3.83	3.93
I would bookmark this site	3.57	3.50	3.57
It was hard to get the information I was looking for	2.37	2.67	2.39
The Web site is laid out well	3.76	3.00	3.70
The energy-saving tips and recommendations are credible information	3.90	3.33	3.86
Overall, the Web site was helpful in getting me to manage my energy use	3.50	3.50	3.50
This Web site was helpful in getting me to make decisions regarding purchasing energy-efficiency equipment	3.46	3.17	3.43

Return visitors somewhat agreed that the Web site was useful, interesting, loaded easily and provided credible information. They also somewhat agreed that they would recommend it to others. One-time visitors were more indifferent toward activities on the Web site. As far as influencing energy behavior is concerned, the Web site did not seem to fully convince visitors to change energy-usage habits. Although, the effect was significantly greater among return visitors.

Exhibit 5-5-3
Consumer Attitude Toward Activities on Californiaenergyconnection.com
Mean agreement on a 5-point scale where 5 means "strongly agree."
Bold indicates significant difference at 95% confidence level.

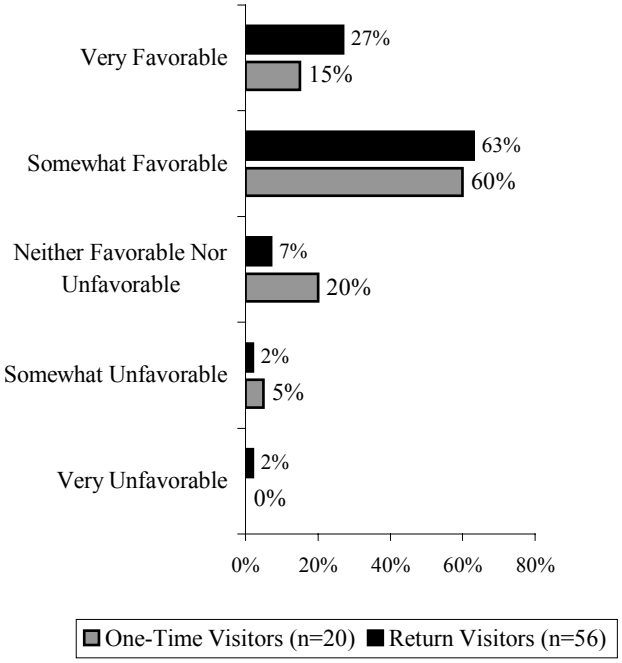
	One-Time Visitors (n=20)	Return Visitors (n=56)
This Web site is interesting	3.45	3.96
This Web site is easy to navigate	3.30	3.82
This Web site is hard to understand	2.15	2.36
This Web site looks appealing	3.60	3.86
This Web site is useful to me	3.75	4.13
This Web site loads quickly and easily	3.50	3.98
I would recommend this site to others	3.70	4.02
I would bookmark this site	2.80	**3.84**
It was hard to get the information I was looking for	2.35	2.41
The Web site is laid out well	3.45	3.79
The energy-saving tips and recommendations are credible information	3.50	**3.98**
Overall, the Web site was helpful in getting me to manage my energy use	3.35	3.55
This Web site was helpful in getting me to make decisions regarding purchasing energy-efficiency equipment	3.00	**3.59**

5.6 USEFULNESS/SATISFACTION

5.6.1 Overall Impression

The majority of visitors rated the Web site as somewhat favorable. There were no significant differences between one-time and return visitors.

Exhibit 5-6-1
Overall Impression of Californiaenergyconnection.com



5.6.2 Usefulness of Activities

Both one-time and return visitors felt that the Web site was a useful site overall. One-time visitors were impressed with the fact they could observe their energy usage history, as were return visitors.

Exhibit 5-6-2
Usefulness of Activities on Californiaenergyconnection.com
Mean agreement on a 5-point scale where 5 means "extremely useful."
Bold indicates significant difference at 95% confidence level.

	One-Time Visitors (n=10)	Return Visitors (n=30)
The site overall	4.00	3.77
Look at my energy usage history	4.60	3.93
Get an energy analysis and custom savings recommendations	3.80	3.63
Use energy calculators to see the costs of various appliances	3.80	3.83
Get tips on energy savings	3.90	3.80
Look for rebate opportunities	3.00	**3.83**
Find out about renewable energy sources	3.20	3.30
Learn about energy-saving products	3.30	**3.80**
Get information about the California energy market	2.50	3.33
See current news about energy	2.90	3.27

5.6.3 Level of Satisfaction with Information

One-time users were most satisfied with the information they obtained regarding energy usage history and energy analysis. They were indifferent about information pertaining to renewable energy sources, energy saving products, the energy market and current news about energy. Return visitors were more balanced in their responses, with energy usage history information bringing the highest satisfaction.

Exhibit 5-6-3
Level of Satisfaction with Information Obtained on Californiaenergyconnection.com
Mean agreement on a 5-point scale where 5 means "very satisfied."
Bold indicates significant difference at 95% confidence level.

	One-Time Visitors (n=10)	Return Visitors (n=30)
Look at my energy usage history	4.10	3.90
Get an energy analysis and custom savings recommendations	3.70	3.80
Use energy calculators to see the costs of various appliances	3.50	3.83
Get tips on energy savings	3.50	3.73
Look for rebate opportunities	3.20	**3.73**
Find out about renewable energy sources	3.00	**3.73**
Learn about energy-saving products	3.10	**3.83**
Get information about the California energy market	3.00	**3.70**
See current news about energy	3.00	**3.73**

5.6.4 Reasons for Overall Impression

Respondents were asked to give a reason for their overall impression of the Web site. Those who gave the Web site a very favorable rating felt that the site was informative and useful, and that it was easy to navigate. Those who gave the Web site a somewhat favorable rating agreed that it provided useful information, but some found the site to be complicated and hard to use

Exhibit 5-6-4
Reasons for Overall Impression of Caliorniaenergyconnection.com

	Rating of Overall Impression				
Reason for Overall Impression	**Very Favorable (n=16)**	**Somewhat Favorable (n=44)**	**Neither Favorable Nor Unfavorable (n=7)**	**Somewhat Unfavorable (n=2)**	**Very Unfavorable (n=1)**
Informative/useful information/suggestions	47%	50%	0%	0%	0%
Easy/quick to use/navigate	37%	12%	0%	0%	0%
Complicated/hard to use/takes to much time	0%	16%	29%	0%	0%
Information was not useful/current	0%	10%	29%	50%	0%
Other	16%	12%	43%	50%	100%

5.6.5 Suggestions for Additional Information or Services

Users in general did not come to a consensus on what improvements or services would be helpful to them on the Web site. Nearly one-fourth (24%) of Residential Users felt that no additional information or services were necessary, and two-thirds of Business Users felt the same way.

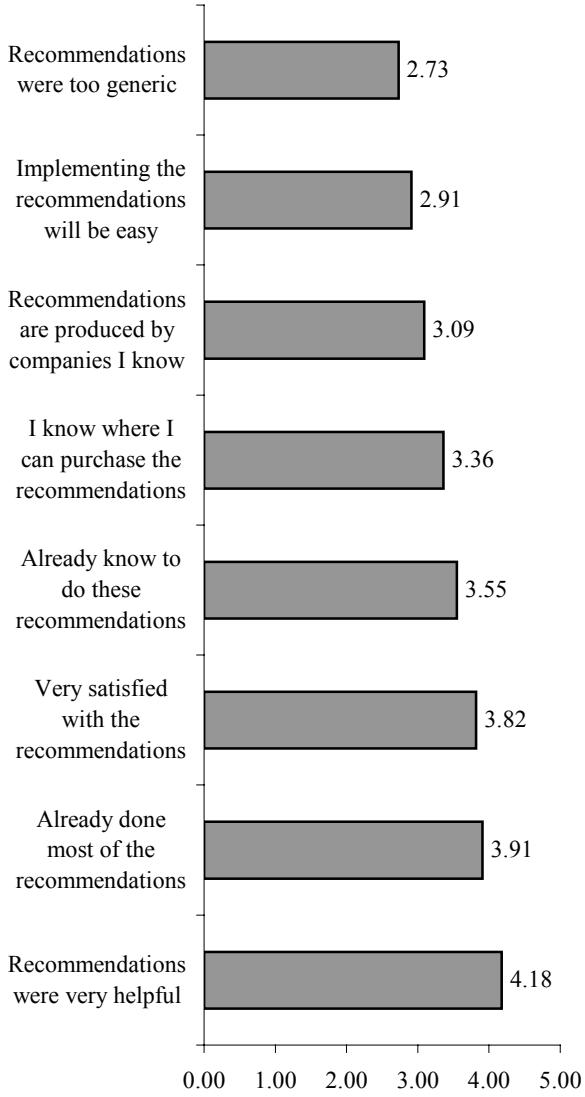
5.6.6 Savings

Respondents were asked if the savings they achieved on their energy bill as a result of implementing the recommendations exceeded, met, or not met their expectations. In general, they felt that their expectations were met. Base sizes were too small for an appropriate quantitative assessment.

5.6.7 Usefulness of Recommendations

Respondents were in partial agreement when asked if the recommendations given were helpful and if they were satisfied with them. Some had already implemented the recommendations. They also felt that implementing the recommendations was not necessarily straight forward or easy.

Exhibit 5-6-5
Usefulness of Recommendations on Californiaenergyconnection.com
Mean agreement on a 5-point scale where 5 means "strongly agree."
(n=11)



5.7 FINDINGS AND RECOMMENDATIONS

The table below summarizes findings and recommendations from the survey research.

Exhibit 5-7-1
Survey Research Recommendations

Severity	Finding	Recommendation
4	Site users tend to have higher incomes and educational levels than non-users. Also, site users were more likely to live in a single family home. This finding is consistent with other energy efficiency research that shows higher income, more educated people are more likely to participate in energy efficiency programs.	Future marketing efforts for the site focus on this demographic group to maximize effectiveness and potential energy savings realization
4	15% of non-users were aware of CEC.com, yet only 3% could identify the site as a source for energy efficiency information. This suggests that the while the current marketing has done a reasonably good job creating awareness, it is not effective at communicating the purpose of the site.	Revise marketing communications to better communicate the site's benefits and purpose to create a stronger association between the Web site and energy efficiency information.
3	A large majority of respondents were looking online for energy efficiency information. Stronger cross linking between CEC.com and other energy efficiency information sources, such as government sponsored sites and manufacturers would increase traffic to CEC.com	Develop stronger ties between PG&E and equipment manufacturers and other energy efficiency information sources to increase site traffic and awareness.
3	The survey data shows that repeat visitors explore more of the site. Greater site exploration has the potential to increase energy savings impacts and promote energy efficient behavior.	Regularly update site content updated. Providing seasonal energy tips, links, and content will keep the site fresh and provide greater incentive for visitors to return.
3	Relatively few respondents reported visiting non-energy efficiency themed areas of the site. These areas include "Energy News" and "CA Energy market information."	Consider dropping or scaling back those areas of the site to free up resources to provide engaging, fresh energy efficiency content.
3	Respondents rated the site's helpfulness in managing energy use as one of the lowest rated areas of the site. This suggests that the content is not presented in a compelling, actionable way that make the benefits clear to the visitor. Also, the site's helpfulness in making energy efficiency product decisions was the lowest rated of all areas on the site. This suggests again that the product information is not presented in a clear. Actionable way.	Review and revise site content revised where appropriate to ensure that the energy efficiency information is presented in a clear, actionable way to visitors. For product information, we suggest that stronger "partnerships" be formed with manufacturers to ensure that information about their products is presented in the best way to help users make decisions.
2	A majority of respondents believed that the Web site was sponsored by the State of California. PG&E was mentioned by the next greatest number of respondents. If PG&E wishes to realize marketing benefit from the site, it will need to be more strongly identified with PG&E.	Modify branding of the site to create more overt ties to PG&E, if this is a marketing goal of PG&E.

6. IMPACT EVALUATION

In this section we analyze the effects of the California Energy Connection Web site (the Web site) on customer behavior. In particular, we estimate the potential for the site to provide quantifiable energy savings and its ability to influence customers to adopt energy savings measures. Furthermore, we analyze the effect that the site has had on customers' intentions to adopt energy saving measures and on their knowledge and attitudes about energy efficiency and conservation.

In order to develop an estimate of potential energy savings, we first conducted a path analysis to determine user attrition from visiting the site to completing the audit to determine the percentage of registered users that actually receive audit recommendations. Second, we conducted a thorough analysis of the energy savings estimates generated by the Home and Business Analyzer audit tools to determine if the audit provides credible estimates of energy savings. Third, we analyzed the potential for the Home Analyzer audit and the energy savings tips provided on the Web site to produce quantifiable energy savings based on the path analysis and energy savings estimates generated by the audit.[4] Using existing market research, we estimated the percentage of the savings potential that might be reasonably achieved due to the Web site influencing customers to adopt the audit recommendations and energy savings tips. Finally, we analyzed user survey responses from the quantitative web survey to assess self reported adoption rates and influence of the site on measure adoptions and intentions. Furthermore, we compared user and non-user responses to questions regarding their self reported knowledge and attitudes about energy efficiency and conservation to assess the effects that the Web site has had on these indicators of market transformation.

6.1 ADOPTION (ATTRITION/PATH) ANALYSIS

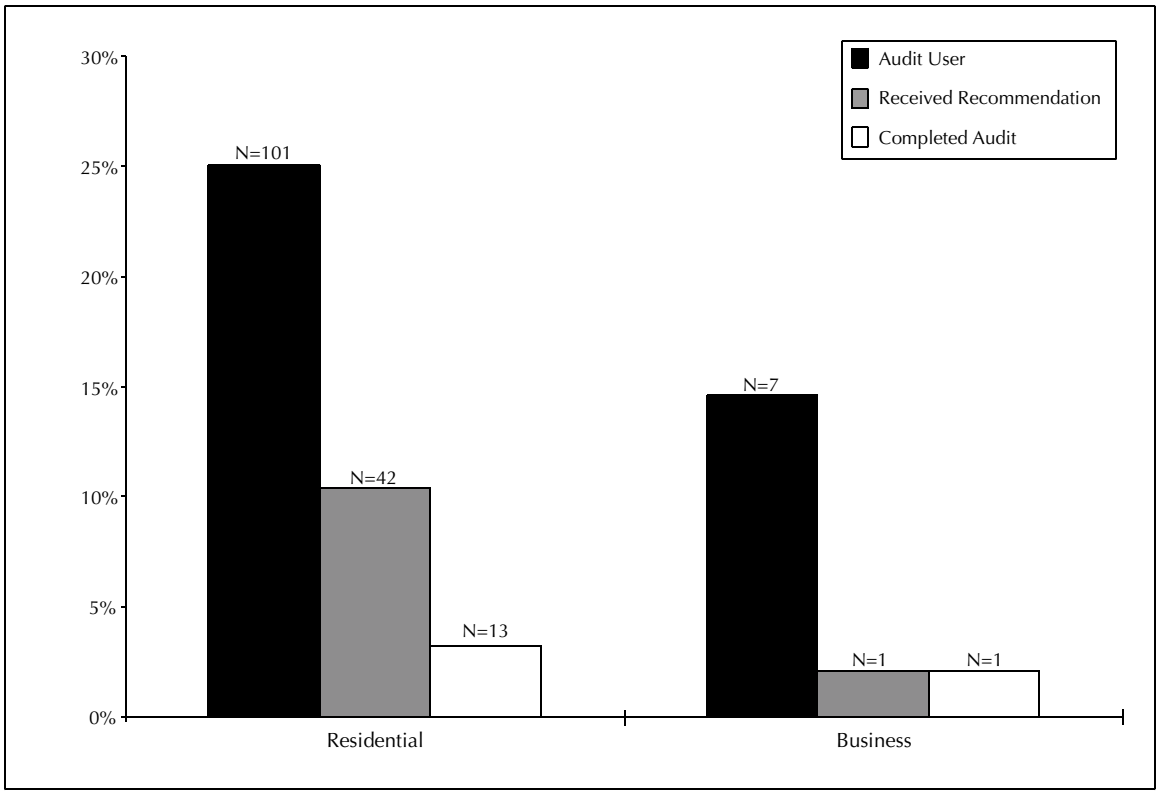
There were 451 registered users on the site as of January 15, 2003. Most of these users (403 or 89%) are residential customers. Although the site was marketed by direct mail to 10,000 residential and 5,000 business "pilot" customers, only 142 residential and 23 business pilot customers registered with the site as of this date.

6.1.1 Path Analysis

Exhibit 6-1 shows the percentage of users that registered with the Home and Business Analyzer audit tools, the percentage that received recommendations (by partly completing at least a portion of the audit or using FastTrack for high-level energy savings recommendations), and the percentage that completed the audit.

[4]There was only one business user that received recommendations from the Business Analyzer audit tool, so this component of the Web site was not analyzed as part of this activity.

Exhibit 6-1
Registered User Attrition Trends



User Interest in Audit Tool. Of the 451 registered users, less that one quarter registered with the energy audit portion of the site, which contained the Home Analyzer and Business Analyzer audit tools. The most frustrating part of the site is the login requirement, according to usability research presented in Chapter 3. Residential users were more likely to register with the audit site – 25% of residential users versus 15% of business users – as were pilot users – 29% among pilot users versus 20% for non-pilot users. These relatively low registration rates with the audit site suggest that the audit tool may not have been of interest to users.

Audit Completion. Forty percent of the residential users that visited the audit part of the site actually completed enough of the audit to receive a set of energy savings recommendations (the user is not required to complete the entire audit to receive recommendations). This equates to about 10% of all residential users registered with the California Energy Connection site that received audit recommendations. Furthermore, only 3% of residential users completed the entire audit (or about 13% that registered with the audit portion of the site). Overall, pilot customers were slightly more likely to receive audit recommendations and complete the site, but not by a substantial amount. Business completions are too few to meaningfully discuss. Seven business users explored the audit tool and only one of those completed an audit. In sum, relatively few users that started the audit process completed it. One barrier to completing the audit tool may be the request for customers to enter monthly billing histories. The WebTrends analysis also revealed that many customers exited the site at this point.

The following usability findings, gathered from the quantitative web survey, offer some insight on user attrition.

- **Too much effort**. Users were surprised that they needed to have their bills on hand to fill in some of the fields. Completing the audit appears to be more involved than users were prepared for.

- **Expected results are not made clear at outset**. Users remarked that they were not sure what they would receive after completing the entire form. Users may have been less willing to participate in the laborious audit process without an idea of what benefits they could receive from an audit.

- **"Steps" nomenclature is confusing**. The layout of the top level of the audit – Step 1 (Analyze Your Usage), Step 2 (Step 2) and Step 3 – implies a progression from Steps 1 to 3, but the three do not have to be completed in order. One user noted, "I didn't realize I could go to Step 3 before doing Step 1 and 2."

6.2 ENERGY SAVINGS ANALYSIS

A key output of the California Energy Connection Web site is to provide customers with actionable recommendations on how they can save energy, along with estimates of what level of savings they can achieve. These savings estimates were generated by the Home Analyzer and Business Analyzer energy audit tools.

To evaluate the savings estimates generated by these tools, we took a two-step approach. We first analyzed the end-use consumption estimates developed by the tools to ensure that the tools did not significantly over or under estimate usage. This enabled us to analyze savings estimates as a percentage of the end use consumption, which is much easier to evaluate, as these values are normalized.

End Use Energy Consumption Analysis

In order to evaluate the end-use consumption estimates produced by the Web site, we obtained a sample of nearly 10,000 residential and 500 business audits that were developed by the same Home Analyzer and Business Analyzer audit tool for the PGE.com Web site. Because the PGE.com Web site has experienced significantly more traffic, and utilizes the same audit tools as the California Energy Connection Web site, PGE.com provided for a more reliable data source for evaluation. We generated mean and median UECs (unit energy consumption) and EUIs (Energy Usage Intensities) for residential and commercial end uses, respectively, that were associated with energy saving measures recommended by the audit tools. These end uses included the following[5]:

[5] The audit did provide measure recommendations associated for a clothes dryer, but did not generate a UEC.

End Use Consumption Evaluated	
Residential End Uses	**Commercial End Uses**
Central Air Conditioning	Cooling
Room Air Conditioning	Heating
Heating System	Ventilation
Water Heater	Indoor Lighting
Refrigerator	Outdoor Lighting
Second Refrigerator	Refrigeration
Freezer	Computer/Office Equipment
Clothes Washer	Water Heating
Dishwasher	Cooking
Lighting	
Hot Tub	
Pool	
Water Bed	
Computer	

To evaluate the audit's consumption estimates, we compared the mean and median values of the UECs and EUIs to PG&E's estimates as reported in their current Residential Energy Survey Report and 1999 Commercial Building Survey Report.

Residential UEC Comparison

We first compared the home size of the residential sample obtained from the audit to PG&E's population to help understand differences that may occur between the samples. Overall, the home size was very similar to the PG&E home size (within 5% based on square footage bins).

Unfortunately there were a few end uses that could not be compared. PG&E did not report UECs for clothes washers, lighting or computers. Furthermore, the audit estimates the motor usage for dishwashing only, as opposed to PG&E, which estimates usage for the motor and heating the water. The audit results, however, for these three end uses look reasonable.

For the most part, the UECs estimated by the audit compared well with the PG&E values. In fact, of the 11 end uses for which comparisons could be made, 8 were within 14%. Those that had significant differences were the waterbed and electric water heating (although gas water heating was within 9%). Both end uses have very low saturations, with only 8% of the population having an electric water heater and 8% having a waterbed, so these differences were not a major concern.

The only other difference of note was the gas heating system, for which the mean usage estimate from the audit was 22% less than the PG&E reported value. This difference may be attributed to the default value that the audit uses for daytime and nighttime thermostat set points, which we recommend the audit developer review for reasonableness.

Overall, however, the UEC estimates compare well with the PG&E values and should provide a credible reference point from which savings estimates can be generated.

Residential Energy Savings Review

The next step was to normalize the energy savings estimates generated by the audit tool, by dividing the energy savings estimate for each recommended measure by the relative end use (or end uses) annual consumption. Overall, the audit tool's savings estimates, expressed as a percentage of end use consumption, looked very credible. We compared these savings estimates to a variety of sources, such as PG&E's advice filings and program evaluations, Department of Energy reports, and the Consumer Guide to Home Energy Savings.

It is important to note that a few energy saving measures either could not be evaluated adequately because the unit energy consumption was either missing, or only captured a portion of the total end use's consumption. In particular, there were no energy consumption values for clothes dryers, and for dishwashers only the motor usage was captured.

Overall, 25% of the measures that could be evaluated had savings estimated at 5% or less of the end use consumption, and 40% had savings estimated at 10% or less. Only one quarter of the measures were estimated to save over 25% of the end use consumption, and only 5 measures were projected to save more that 50%. Of these 5 measures, two are very credible: replacing a waterbed with a standard bed, which would save 100% of energy use, and turning off computers when not in use for households. It is important to note that this computer measure is generally only recommended of customers that leave their computer on overnight. The savings estimate is usually based on a computer CPU and monitor being left on all 8,760 hours of the year and being reduced to only a few hours a day. These conditions create an impact estimate that can exceed 1,000 kWh per computer, which make this measure one the largest contributors to the overall potential savings. For example, over 1,000 audit recommendations were provided to 42 users that registered with the California Energy Connection site. Of these 1,000 recommendations 16 were turning off computers when not in use. These 16 recommendations comprised 25% of the total savings across the 1,000 recommendations, even though they only comprised 1.6% of the recommendations.

Another measure with a high percent savings estimate is to air dry dishes, where the energy consumption is not capturing the heating element, explaining the high percentage savings estimate. The other two high impact measures are replacing an air conditioner or an electric water heater with a high efficiency model. The typical savings estimate produced by the audit for air conditions is 67% savings, which is quite high. The audit estimates savings assuming that a 14.1 SEER unit is installed, which is significantly higher than what most consumers purchase, even when buying high efficiency equipment and should be reviewed. Furthermore, even by installing a 14.1 SEER unit, a 67% savings is difficult to achieve.

For the electric water heater, the typical savings estimates produced by the audit is 53%, which assumes that the customer retrofits with a heat pump water heater. Due to the relatively high costs of heat pump water heaters, it may be more likely that the customer will install a conventional electric water heater unless specifically directed to do so in the measure recommendation, which is not the case. If a customer replaces an old water heater with a more efficient water heater that is not a heat pump water heater, savings would be closer to 10 to 20%. The measure to replace a gas water heater with a more efficient model typically has a more reasonable savings estimate of 9%.

The only other measures that have questionable savings estimates are one water heating and a few weatherization/shell measures. The water heating measure is installing a heat recovery unit on the air conditioner or heat pump, which has a typical savings estimate of 39% of water heater usage. This seems rather high. Keep in mind that for air conditioners, savings can only be achieved during times when the air conditioner is used. Furthermore, the savings value of 39% often exceeds the entire estimated energy consumption of the air conditioner (exceeds air conditioner UEC 40% of the time). Typical savings for this measure is generally 10% or less. Compounding the problem of this overestimated savings value is the issue discussed above of the relatively high usage estimates for electric water heating.

The cooling measure that is questionable is using the whole house fan more, which is estimated as a negative impact, typically increasing usage by about 22% of the cooling usage. This measure is always associated with a negative savings estimate in the audit results. The audit assumes that the increase energy usage associated with the whole house fan is greater than the amount of energy savings associated with reduced central air conditioning. However, PG&E views this as an energy saving measure (not energy-increasing), estimated to save 424 kWh per home in its 2002 program filing. If the measure continues to have a negative savings value, we recommend not providing this as a recommendation to users.

The final three measures of concern are all weatherization/shell measures: replacing windows with energy efficient windows, caulking windows and doors, and improving attic, wall or foundation insulation. All three measures are resulting in a positive heating impact, but a negative cooling impact. Essentially, these measures are increasing insulation or reducing infiltration. So, during the cooling season when the temperature outside is cooler than the temperature inside the home (e.g. at night and early morning), the home cannot release the heat that is captured inside and it uses more cooling load during the day to extract this heat. The audit estimates this cooling "penalty" to be greater than the cooling savings that are achieved during the day, which are created by these measures keeping the conditioned air inside the home and the hot air outside from entering. Often times, customers will naturally ventilate their homes at night by opening windows to allow the cool nighttime are into the home. This action would reduce or eliminate the cooling "penalty" resulting in the measures having a net positive cooling impact. We recommend that this behavior of natural ventilation be reviewed, and the cooling savings values potentially be revised for one or all of these measures. For example, PG&E views insulation as an energy saving measure, estimated to save 0.13 kWh per square foot of insulation added, in its 2002 program filing.

Business EUI Comparison

The comparison analysis for the business sector poses additional challenges relative to the residential sector, as usage is highly correlated with customer size and business type. Therefore, there is a lot more variation with usage across businesses. Furthermore, our sample sizes were more limited. To help overcome these challenges, we normalized usage by square footage, as discussed above, and also analyzed offices and retail businesses separately (these were the only two business types with sufficient sample to analyze separately). However, even by segmenting the customers and normalizing for square footage, we still expect there to be some significant differences when comparing to the PG&E population estimates, due to variation across the samples.

Overall, the average EUI estimated by the audit tool was comparable to that reported by PG&E in their 1999 Commercial Building Survey Report, only 12% higher. For offices and retail businesses, the audit tool's estimated EUI was 21% and 9% higher, respectively. We also looked at Therms per square foot and found that the audit tool's value was 15% lower overall, but 50% higher among offices and 4% lower among retail businesses.

Next, we analyzed the distribution of energy consumption by end use. Generally, the audit tool appeared to overestimate lighting consistently, both overall and by end use: 22% overall, 71% for offices, and 34% for retail businesses. The difference in lighting could be attributable to the use of self reported operating hours. In particular with offices, lights are turned off during operating hours, which could lead to overestimating lighting loads.

Conversely, the audit tool underestimated cooling load consistently: 70% lower than the PG&E estimate overall, 71% lower for offices and 59% lower for retail. Heating loads were typically higher for the audit tool (potentially due to more electric heat among the audit sample, which would also explain the higher kWh EUI and lower Therm EUI overall), but even the combined heating and cooling loads were significantly lower among the audit sample.

Other differences did exist, but these appeared to be the most significant and the most consistent.

Overall, given the differences in customer size, business type, geography, and equipment stock that exist between the audit and PG&E samples, the EUIs seem credible. However, we would recommend a review of the lighting and cooling assumptions, as these are the end uses that are most frequently affected by energy savings measures.

Business Energy Savings Review

As with the residential savings analysis, the next step was to normalize the energy savings estimates generated by the audit tool, by dividing the energy savings estimate by the relative end use (or end uses) annual consumption. Overall, the savings estimates, expressed as a percentage of end use consumption, looked very credible. We compared these savings estimates to a variety of sources, such as PG&E's advice filings and program evaluations, and Department of Energy reports.

Overall, approximately 25% of the measures evaluated had savings estimated at 5% or less of the end use consumption, and nearly 70% had savings estimated at 10% or less. Only eight measures (15%) were typically estimated to save over 25% of the end use consumption, and no measure exceeded more than 50%.

The largest savings measures in terms of percent savings of end use consumption were: installing a heat pump water heater at 50% savings, using power-down cash registers at 42% savings, installing heat pumps at 40% savings, and retrofitting exterior lights with HIDs at 40% savings, all of which are reasonable.

Therefore, our primary concern is that the lighting measures could be slightly over-estimated due to the lighting EUIs looking high, and conversely the cooling measures being under-estimated due to the low EUIs.

6.3 ENERGY SAVINGS POTENTIAL

An objective of this evaluation was to assess the potential for the California Energy Connection Web site to provide energy savings. There are at least four clear ways in which the Web site could influence customers to save energy:

1. Providing customized energy savings recommendations as a result of completing all or a portion of the Home or Business Analyzer audit.

2. Providing energy savings tips.

3. Providing information on how to obtain rebates for purchasing energy efficient equipment.

4. Providing information on energy efficient products, including links to manufacturer web sites.

In this section we analyze the potential energy savings the Web site has generated to date. For this, we focus only on the first two items listed above: the Home Analyzer tool and the energy savings tips.[6] Of the four items listed above, it might be expected that the Home Analyzer tool would provide the most significant potential for energy savings, as the tool provides a number of customized energy saving recommendations tailored to specific customer responses. In addition, the energy saving tips are likely to be frequently viewed by users, and we can estimate energy savings associated with these tips to develop a potential savings value. For the latter two, it is much more difficult to assess the potential savings associated with information about products and rebates.

In the next section, we will analyze survey data to determine if the Web site has had any influence on actual customer behavior. In this section, we focus on the hypothetical potential the site has generated to date.

6.3.1 Potential Energy Savings Associated with the Home Analyzer Audit

As discussed above in Section 6.1, through January 15th, 2003, the California Energy Connection site had attracted a total of 451 registered users, of which 403 were residential users. Of these 403 residential users, 42 received recommendations completing all or a portion of the Home Analyzer audit. Only one of the 48 registered business users received a recommendation from the Business Analyzer audit. However, the majority of users did visit the section of the Web site that provided energy savings tips: of 76 users surveyed 93% (or 71) viewed these tips.

Exhibit 6-2 below summarizes the recommendations received by the 42 residential users that completed at least a portion of the Home Analyzer audit. The table below classifies each recommendation as either a low cost/no cost measure (such as changing thermostat set points, or purchasing a CFL) or an investment level measure (such as purchasing an energy efficient refrigerator). Shown are some of the key measures that are either more frequently

[6] Because only one business user received audit recommendations, the potential for the Business Analyzer is not addressed.

recommended, or that provide significant levels of potential savings. Also shown are the subtotals for all low cost/no cost measures and investment level measures, as well as the overall total. For each measure, or total, the exhibit presents the number of recommendations received and the total energy savings associated with those recommendations. In addition, the exhibit presents the total energy savings divided by the 42 users that received recommendations and the 403 registered residential users. These two values indicate estimates of what typical savings can be expected for a given user that completes at least a portion of the audit (enough to get recommendations) and for a given user that registers with the Web site.

Exhibit 6-2
Savings Potential of Home Analyzer Audit
Based on 42 Audits Completed Through January 15, 2003

Recommendations		# of Rec's	Total Savings Recommended		Savings per Audit		Savings per Registered User	
Measure ID	Measure Description	Received	kWh	Therm	kWh	Therm	kWh	Therm
Key Low Cost/ No Cost Measures								
FS8	Properly maintain your refrigerator and clean the coils.	33	862	.	20.5		2.1	
HT1	Lower the thermostat setting of your heater	35	2,020	1,420	48.1	33.8	5.0	3.5
LT3	Use compact fluorescent lamps in high-use lamps	13	3,388	.	80.7		8.4	
LT4	Replace halogen torchiere with compact fluorescent torchiere	10	3,757	.	89.5		9.3	
OA10	Turn off your computer when not in use	16	34,929	.	831.6		86.7	
WE3	Caulk windows and doors to prevent drafts	40	(1,449)	2,112	(34.5)	50.3	(3.6)	5.2
WH10	Lower the temperature setting of your water heater	26	726	577	17.3	13.7	1.8	1.4
WH13	Install low flow showerheads	20	1,369	467	32.6	11.1	3.4	1.2
WH14	Take shorter showers	24	2,373	859	56.5	20.5	5.9	2.1
WH7	Air dry dishes	34	1,487	.	35.4		3.7	
Total - All Low Cost/No Cost Measures		**703**	**71,534**	**7,324**	**1,703**	**174**	**178**	**18**
Key Investment Level Measures								
FS13	Replace your refrigerator with a more efficient model	10	5,875	.	139.9		14.6	
HT16	Replace your heating system with a more efficient system	30	8,722	579	207.7	13.8	21.6	1.4
WE1	Replace the windows in your home with energy efficient windows	15	1,011	1,462	24.1	34.8	2.5	3.6
WE5	Improve attic, wall or foundation insulation	31	172	1,208	4.1	28.8	0.4	3.0
WE6	Seal leaks in air ducts	36	3,076	761	73.2	18.1	7.6	1.9
WE7	Install exterior solar screens on windows	21	20,409	.	485.9		50.6	
WH17	Install heat traps for your water heater	34	1,640	420	39.0	10.0	4.1	1.0
WH22	Replace your water heater with a more Efficient model	19	3,507	385	83.5	9.2	8.7	1.0
Total - All Investment Level Measures		**314**	**65,442**	**5,446**	**1,558**	**130**	**162**	**14**
TOTAL - ALL MEASURES RECOMMENDED		**1,017**	**136,976**	**12,770**	**3,261**	**304**	**340**	**32**

It is important to note that this analysis is based on a small sample of only 42 users that received recommendations, and should only be used to qualitatively understand the potential of the site to provide energy savings. Furthermore, the energy savings potential shown is based on the savings values calculated by the Home Analyzer. As discussed in the previous section, the Home Analyzer was found to provide credible estimates of savings overall, however there were a few issues highlighted.

Overall, these 42 users received over 1,000 recommendations, or nearly 24 recommendations per audit. The majority (70%) of these recommendations were for low cost and no cost measures. The total savings associated with these recommendations was 137 MWh and 12,770 therms. Low cost/no cost measures were responsible for 52% of the potential kWh savings and 57% of the potential therm savings.

The average energy savings potential for an audit was 3,261 kWh and 304 therms. For each registered user, there was an average of 340 kWh and 32 therms of potential energy savings if all recommendation were followed.

As discussed in the previous section, there are a few measures over which there is some concern. In particular, measure ID OA10, turning off computers when not in use, contributes one quarter of the overall potential electric energy savings. Measure ID WE3, caulking windows and doors, contributes a negative savings amount.

Overall, it is reasonable that an audit as comprehensive as the Home Analyzer would provide recommendations with the potential to save 3,261 kWh and 304 therms, which corresponds to about 44% and 49% of PG&E's reported annual electric and gas energy consumption, respectively.

While it is not reasonable to assume that for every residential customer that registers with the California Energy Connection Web site, that 340 kWh and 32 therms will be saved, it is reasonable to assume that the Web site will influence customers to adopt some of these recommendations. For example, Southern California Edison (SCE) recently completed an impact evaluation of their on-line home energy audit in September 2002 by Ridge and Associates, titled "Evaluation of Southern California Edison's Residential Audit Programs: Final Report". In this study, it was found that residential customers that completed an on-line home energy audit were provided an average of 5.9 recommendations, of which 2.9 were adopted (or 49%), saving on average 171 kWh. Clearly, the Home Analyzer audit provides significantly more recommendations (24 on average). But, 171 kWh is approximately 10% of the per audit savings associated with all low cost/no cost recommendations, or 5% of the overall per audit savings for all recommendations (including investment level measures). It would be conservative due to the greater number of recommendations made by the Home Analyzer, to assume that the California Energy Connection Web site could achieve 5% of the savings potential, which would equate to approximately 18 kWh and 1.7 therms per registered user. However, it would probably be greatly overstated to assume that 49% of the measures recommended would be adopted, as was the case with SCE's on-line home energy audit.

Another example of an evaluation of program savings was with PG&E's 1-2-3 Residential Cashback program. While primarily a rebate program, the 1-2-3 program also provided information on energy savings tips and was successful in influencing customers to adopt energy conservation behaviors. In QC's October 2002 "Assessment of Customer Behaviors and Practices Due to 1-2-3 Cashback", we found that the program influenced customers to save 22.6 GWh. Considering that approximately 500,000 customers were aware of the 1-2-3 program, that equates to 45 kWh of savings per aware customer for low cost and no cost measures. This 45 kWh is approximately 25% of the 178 kWh of low cost/no cost savings potential per registered user generated by the Home Analyzer. However, it is important to note that these savings levels were achieved during the 2001 energy crisis, and during a time when the 20/20

rebate program was being offered, which provided customers with a 20% bill rebate for reducing their usage by 20%.

As part of the Assessment of Customer Behaviors and Practices Due to 1-2-3 Cashback, we also found that 27% of the customers who completed a home energy audit (not necessary on-line) with PG&E were very influenced to save energy through conservation, 14% were very influenced to purchase a low cost measure, and 6% were very influenced to purchase a major appliance, and as a result of the audit.

If the California Energy Connection Web site is capable of influencing customers to adopt 10% of the savings associated with the low cost/no cost audit recommendations and only 5% of savings associated with the investment level measures, that would result in a savings of approximately 26kWh and 2.5 therms for each registered residential user. On a per audit basis, this would be equivalent to 248 kWh and 24 therms, which represents an average reduction in usage of approximately 3% based on PG&E's reported whole premise usage.

6.3.2 Potential Energy Savings Associated with the Energy Saving Tips

In addition to the Home and Business Analyzer tools are the energy savings tips provided on the site. As discussed above, 93% of the residential and business users surveyed viewed these tips. Many of these energy savings tips are also provided as savings recommendations in the Home and Business analyzer. For the purposes of estimating potential, we assumed that the customers that view the energy savings tips have approximately the same energy savings potential for a given measure, as those that complete a portion of the audit[7]. Focusing solely on residential recommendations (as we only have data from the Home Analyzer to use to estimate savings), the savings potential for the energy savings tips are 365 kWh and 84 Therms. Given that only 93% of the users view these tips, and another 10% go on to do the Home Analyzer (where they are likely to receive many of the same recommendations), the savings potential (incremental over the Home Analyzer) per registered user is approximately 305 kWh and 70 Therms.

It is likely that the energy savings tips are less influential than the audit recommendations, which are more tailored to the user. Therefore, if we assume that the California Energy Connection Web site is capable of influencing customers to adopt 5% (half the influence of the Home Analyzer audit) of the savings associated with the energy savings tips, that would result in a savings of approximately 15 kWh and 3.5 therms for each registered residential user.

Again, consider that participants in SCE's home energy audit received 5.9 recommendations on average and adopted 49% of these measures. Also, as part of the Assessment of Customer Behaviors and Practices Due to 1-2-3 Cashback, we found that 11.5% of the customers who visited PG&E's Web site were very influenced to save energy through conservation and 6% were very influenced to purchase a low cost measure. These results provide some credibility to the assumptions in potential adoptions due to the energy savings tips.

[7] Assuming the average savings per audit is more conservative than using the average savings per recommendation. Because the audit only makes a recommendation when the savings are technically feasible, using this value is more realistic for estimating potential.

6.3.3 Overall Potential Energy Savings Associated with the Web Site

Combining the savings from the Home Analyzer audit and the energy savings tips, these assumed adoption rates would equate to an energy savings of 41 kWh and 6 therms per registered user. Although we do not recommend using these values for program planning, it does indicate that there are significant savings potential that could be generated by the California Energy Connection Web site. For example, SCE's on-line home energy audit had a first year gross savings of 371,490 kWh based on 2,167 completed audits.

In the next section, we will analyze self reported rates of adoption and program influence based on survey data collected from actual users of the Web site. Although the sample sizes for users are small, this analysis will provide further indication of the potential savings that the site could generate.

6.4 IMPACT EVALUATION

As discussed above, there are a number of ways in which we may expect the Web site to have an impact on customer behavior. This section explores four primary ways in which the Web site could influence customer adoption and intentions to adopt energy efficiency and conservation measures, as well as affect their knowledge of and attitudes toward energy efficiency and conservation. Specifically this section reports:

- How the Home Analyzer audit has influenced energy efficiency and conservation adoptions and intentions.
- How the energy savings tips have influenced energy efficiency and conservation adoptions and intentions.
- How the rebate finder tool, product information and manufacturer links have influenced energy efficient equipment purchases
- How the site has increased users' knowledge about energy efficiency and conservation measures.

6.4.1 Impact of Home Analyzer Audit

As part of the quantitative survey, users that completed at least a portion of the Home Analyzer audit were asked a series of questions about a number of the recommendations (up to 15) that they received[8]. Specifically, users were asked which of the recommended measures they had adopted since visiting the Web site, which measures they intend to adopt within the next year, those that they had adopted prior to visiting the Web site and those they have no intention to adopt. Furthermore, for those measures customers indicated they had either adopted since visiting the web site or had intentions to adopt, users were asked to rate the influence the Web site had on their decision to adopt or on their intention (on a 1-10 scale, where an 8, 9 or 10 are considered very influential).

[8] This analysis is limited only to the residential Home Analyzer tool, as only one business user had completed the Business Analyzer.

Audit Adoption Rates

Exhibit 6-3 below presents the percentage of customers that responded to each category of adoption for each recommended measure. It is important to note that this analysis was conducted on a very small sample size. Only 11 customers that received audit recommendations responded to the quantitative survey, and the sample size for a given measure never exceeded 9.

Exhibit 6-3
Adoption Rates for Home Analyzer Audit Recommendations

Energy Saving Measures	MID	Adopted Measure Prior to Visting Website	Adopted Measure Since Visiting Website	Plan to Adopt Measure within Year	Do Not Plan to Adopt Measure	Sample Size
Low Cost / No Cost Measures						
Dry full loads of clothes when possible	WH91	80%	20%	0%	0%	5
Insulate hot water pipes for your water heater	WH19	22%	0%	22%	56%	9
Properly maintain your water heater	WH16	44%	11%	33%	11%	9
Take shorter showers	WH14	100%	0%	0%	0%	1
Install low flow showerheads	WH13	40%	0%	20%	40%	5
Install efficient faucet heads (aerators) on bathroom and kitchen sinks	WH12	57%	0%	14%	29%	7
Lower the temperature setting of your water heater	WH10	44%	11%	22%	22%	9
Air dry dishes	WH7	44%	22%	11%	22%	9
Wash full loads of dishes when possible	WH5	50%	50%	0%	0%	4
When not washing full loads of clothes match the load setting to the size of the	WH2	67%	0%	33%	0%	3
Wash full loads of clothes when possible	WH1	100%	0%	0%	0%	4
Caulk windows and doors to prevent drafts	WE3	44%	22%	11%	22%	9
Use compact fluorescent lamps in high-use lamps	LT3	33%	0%	33%	33%	3
Turn lights off when you're not using them	LT1	80%	0%	20%	0%	5
Turn off pilot light of your heater during summer	HT4	0%	100%	0%	0%	1
Avoid heating unoccupied areas	HT2	0%	100%	0%	0%	1
Lower the thermostat setting of your heater	HT1	44%	44%	11%	0%	9
Raise the temperature setting of your refrigerator	FS9	50%	0%	0%	50%	2
Properly maintain your refrigerator and clean the coils	FS8	75%	0%	25%	0%	8
Total No Cost / Low Cost Weighted by Number of Recommendations		**51%**	**15%**	**17%**	**17%**	**103**
Weighted by Total Energy Savings		**45%**	**22%**	**15%**	**18%**	**103**
Investment Level Measures						
Install heat traps for your water heater	WH17	11%	0%	22%	67%	9
Replace your clothes washer with a horizontal axis (side loading)	WH4	0%	0%	25%	75%	4
Seal leaks in air ducts	WE6	14%	0%	14%	71%	7
Improve attic, wall or foundation insulation	WE5	13%	0%	13%	75%	8
Insulate your air ducts	WE4	17%	0%	17%	67%	6
Replace the windows in your home with energy efficient windows	WE1	0%	0%	50%	50%	2
Install an Add-on Heat Pump	HT27	0%	0%	0%	100%	1
Replace your heating system with a more efficient system	HT16	0%	0%	100%	0%	1
Replace your refrigerator with a more efficient model	FS13	0%	0%	0%	100%	2
Total Investment Level Weighted by Number of Recommendations		**10%**	**0%**	**20%**	**70%**	**40**
Weighted by Total Energy Savings		**8%**	**0%**	**24%**	**68%**	**40**
TOTAL Weighted by Number of Recommendations		**40%**	**10%**	**17%**	**32%**	**143**
Weighted by Total Energy Savings		**30%**	**13%**	**19%**	**38%**	**143**

Users reported that they had adopted 15% of the no cost/low cost measures that were given, and had intentions to adopt another 17% of the recommendations. When weighted by the energy savings associated with measures, users adopted more recommendations with high savings values, having adopted 22% of the potential energy savings from recommendations since visiting the Web site. However, user intentions only comprised 15% of the potential energy savings. For investment level measures, it was not surprising to find that no users had adopted a measure since visiting the Web site. Most customers had completed their audit within the last month or two, not giving sufficient time for them to adopt investment level measures. However, users had intentions to adopt 20% of the investment level measures over the next year, which corresponded to 24% of the potential energy savings.

Overall, across all measures, users reported having adopted 10% of the recommendations (13% of the energy savings potential) since visiting the Web site, and had intentions to adopt another 17% of the recommendations (19% of savings).

Audit Influence

Users were also asked how much the Web site influenced their decision to adopt or their intention to adopt a given measure. Exhibit 6-4 below presents the percent of users that reported that the Web site was very influential (8 through 10 on a 1 to 10 scale) on their decision or intention to adopt a given measure. Across all low cost/no cost measures, the Web site influenced about 60% of the measure adoptions and about half of the intentions to adopt. As a result, about 14% of the potential energy savings across all recommended low cost/no cost measures were adopted due to the influence of the audit. Furthermore, another 7% of the potential energy savings recommendations are likely to be adopted within the next year as a result of the audit. Although this is based on a very small sample, and should NOT be considered to be a statistically significant result, it does validate the assumptions for achievable potential of a 10% adoption rate discussed in Section 6.2.

Exhibit 6-4
Influence on Adoptions of Home Analyzer Audit Recommendations

Energy Saving Measures	MID	Adopted Measure Since Visiting Website	Percent Very Influenced by Website to Adopt	Plan to Adopt Measure within Year	Percent Very Influenced by Website to Adopt	n
Low Cost / No Cost Measures						
Dry full loads of clothes when possible	WH91	20%	0%	0%	0%	5
Insulate hot water pipes for your water heater	WH19	0%	0%	22%	50%	9
Properly maintain your water heater	WH16	11%	0%	33%	33%	9
Take shorter showers	WH14	0%	0%	0%	0%	1
Install low flow showerheads	WH13	0%	0%	20%	0%	5
Install efficient faucet heads (aerators) on bathroom and kitchen sinks	WH12	0%	0%	14%	0%	7
Lower the temperature setting of your water heater	WH10	11%	100%	22%	100%	9
Air dry dishes	WH7	22%	100%	11%	100%	9
Wash full loads of dishes when possible	WH5	50%	100%	0%	0%	4
When not washing full loads of clothes match the load setting to the size of the	WH2	0%	0%	33%	100%	3
Wash full loads of clothes when possible	WH1	0%	0%	0%	0%	4
Caulk windows and doors to prevent drafts	WE3	22%	50%	11%	100%	9
Use compact fluorescent lamps in high-use lamps	LT3	0%	0%	33%	0%	3
Turn lights off when you're not using them	LT1	0%	0%	20%	100%	5
Turn off pilot light of your heater during summer	HT4	100%	0%	0%	0%	1
Avoid heating unoccupied areas	HT2	100%	0%	0%	0%	1
Lower the thermostat setting of your heater	HT1	44%	75%	11%	0%	9
Raise the temperature setting of your refrigerator	FS9	0%	0%	0%	0%	2
Properly maintain your refrigerator and clean the coils	FS8	0%	0%	25%	50%	8
Influenced No Cost / Low Cost Adoptions/Intents Weighted by Number of Recommendations		**9%**	**60%**	**9%**	**53%**	**103**
Weighted by Total Energy Savings		**14%**	**63%**	**7%**	**47%**	**103**
Investment Level Measures						
Install heat traps for your water heater	WH17	0%	0%	22%	50%	9
Replace your clothes washer with a horizontal axis (side loading)	WH4	0%	0%	25%	100%	4
Seal leaks in air ducts	WE6	0%	0%	14%	100%	7
Improve attic, wall or foundation insulation	WE5	0%	0%	13%	0%	8
Insulate your air ducts	WE4	0%	0%	17%	100%	6
Replace the windows in your home with energy efficient windows	WE1	0%	0%	50%	0%	2
Install an Add-on Heat Pump	HT27	0%	0%	0%	0%	1
Replace your heating system with a more efficient system	HT16	0%	0%	100%	0%	1
Replace your refrigerator with a more efficient model	FS13	0%	0%	0%	0%	2
Influenced Investment Level Apoptions/Intents Weighted by Number of Recommendations		**0%**	**-**	**10%**	**50%**	**40**
Weighted by Total Energy Savings		**0%**	**-**	**5%**	**23%**	**40**
TOTAL INFLUENCED ADOPTIONS/INTENTS Weighted by Number of Recommendations		**6%**	**60%**	**9%**	**52%**	**143**
Weighted by Total Energy Savings		**8%**	**63%**	**6%**	**34%**	**143**

Across all investment level measures, the Web site influenced about one quarter of users' intentions to adopt the recommendations (23% of the energy savings, but 50% of the recommendations). As a result, users had intentions to adopt within the next year about 5% of the potential energy savings across all recommended investment level measures, due to the influence of the audit. As discussed above, it is likely too soon since the users received the audit recommendations, for them to have made an investment level adoption. Again, even though this is based on a very small sample, and should NOT be considered to be a statistically significant result, it does validate the assumptions for achievable potential of a 5% adoption rate discussed in Section 6.2.

Across all measures, users reported being very influenced to adopt 6% of all recommended measures, accounting for a total of 8% of the potential energy savings. Furthermore, users had intentions to adopt another 9% of the recommended measures within the next year, accounting for a total of 6% of the potential energy savings.

Reasons for Not Adopting

Users that indicated that they had no intention to adopt a recommended measure, provided a reason for their decision. For low cost/no cost measures, the responses were evenly divided between not having enough information, the tip being too much of a hassle to implement and being too expensive to implement. For investment level measures, the most commonly cited reason was that the measure was too expensive to implement, followed by too much hassle to implement. Overall, however, these three top reasons consisted of only 50% of all responses. These results are provided in Exhibit 6-5 below.

Exhibit 6-5
Reasons for Not Adopting Home Analyzer Audit Recommendations

Reason for not Adopting	Low Cost/No Cost Measures	Investment Level Measures	Overall
Too Expensive	14%	29%	22%
Too Much Hassle	14%	17%	15%
Not Enough Info	18%	8%	13%
Other Reason	55%	46%	50%
Sample Size	22	24	46

Issues Affecting Adoption Rates

One potential concern with the audit recommendations is the fact that users reported having adopted 51% of the low cost/no cost recommendations prior to visiting the Web site. The reason we raise this as a concern is that the likelihood of users adopting a recommendation is strongly correlated to the customization and credibility that they assign to the recommendations. If users are receiving a number of recommendations that they feel are generalized, and not tailored to their audit responses, because they have already adopted the

recommendation, it may affect the level of credibility they assign to their entire set of recommendations. In other words, giving customers a large number of recommendations that they have already implemented may reduce the likelihood of them adopting those recommendations that they have not yet adopted. Fortunately, this is not the case with the investment level recommendations, where customers had only previously adopted 10% of the recommendations.

It is also important to note that in the Usability Testing, users commented that the audit tool was not specific enough, and that they were frequently disappointed with the generalness of the information presented. Users considered that being customized to their own billing and housing information would add value to the tools. Of the 11 users that received recommendations and participated in the quantitative survey, 5 agreed with the statement that the recommendations were too generic. Furthermore, most (8) only somewhat agreed that the tips were credible (however, none disagreed).

The issue that many users received recommendations that they believed to be too general may be further compounded by the large number of recommendations received by users. As discussed in Section 6.3, users that completed at least a portion of the audit received on average 24 recommendations. Such a large number could also potentially detract from the recommendations appearing to be customized. In contrast, SCE's home energy audit provided a smaller number of recommendations (only 5.9 recommendations on average), and obtained a high adoption rate of 49%.

We recommend considering reducing the number of recommendations a customer receives by eliminating those that have negative savings, excessively long payback periods, or very small associated savings. Across all recommendations received by users, 4% had negative savings, 20% had payback periods that exceeded 10 years, 33% had savings estimates that were less than $5 per year, and over half had savings estimates that were less than $12 a year (or $1 per month on average). Such recommendations can either be eliminated (in particular the negative savings and long payback periods), or presented to the user as "additional" recommendations that are placed at the end of their audit report (in particular the low savings measures which generally are no cost measures).

Finally, one related issue regarding user perception of the credibility of the audit recommendations is the low completion rate the audit has among customers that receive recommendations. As discussed in Section 6.1, of the 42 users that received audit recommendations, only 13 (or 25%) completed the entire audit. The more of the audit that users complete, the more customized and accurate the recommendations will be. Unfortunately there is not enough data to test this hypothesis, but we might expect that users that complete the entire audit are more likely to adopt the recommendations provided. Therefore, some consideration should be given to ways in which customers can be enticed to complete the entire audit.

6.4.2 Impact of Energy Saving Tips

Customers that participated in the quantitative user survey were also asked if they had viewed the web page that provided energy saving tips.[9] These users were asked which tips they had adopted since visiting the Web site, which they intend to adopt within the next year, and those that they had either adopted prior to visiting the Web site or have no intentions to adopt. Furthermore, users that indicated they had adopted the tips since visiting the web site or had intentions to adopt, were asked to rate the influence the Web site had on their decision to adopt or on their intention (on a 1-10 scale, where an 8, 9 or 10 are considered very influential).

Energy Saving Tip Adoption Rates

Exhibit 6-6 below presents the percentage of customers that responded to each category of adoption for each energy saving tip. This analysis was based on a much more robust sample size of 66 users, relative to the audit analysis.

Overall, users reported having adopted 16% of the energy saving tips since visiting the web site, and intended to adopt another 17% within the year. Of most note were the adoption rates of 29% for using fluorescent lighting and 26% for moving the refrigerator and cleaning its coils. As for intentions, another 33% intended to move their refrigerator and clean its coils, 27% to weatherize their homes by caulking holes and cracks around windows, and 26% to install an attic whole house fan.

[9] The analysis of the energy savings tips is limited only to residential users as only 6 business users responded to the quantitative survey.

Exhibit 6-6
Adoption Rates for Residential Energy Saving Tips

Residential Energy Savings Tip	Adopted Tip Prior to Visting Website	Adopted Tip Since Visiting Website	Plan to Adopt Tip within Year	Do Not Plan to Adopt Tip
In the winter, turn your thermostat down when your home is unoccupied	80%	17%	2%	2%
In the summer, turn your thermostat up when you leave your home	65%	15%	9%	11%
Consider installing an Energy Star® programmable thermostat	48%	14%	17%	21%
Consider installing an attic whole house fan	15%	2%	26%	58%
To heat your home, keep the shutters, drapes, and blinds on south-facing windows open during the day	56%	18%	12%	14%
During the cold winter months, close all shutters, drapes, and/or blinds at night	68%	17%	5%	11%
Move your refrigerator-freezer out from the wall for good air circulation and vacuum its condenser coils once a year	32%	26%	33%	9%
Use latex or silicone caulk to fill holes and cracks around windows	41%	15%	27%	17%
Consider using fluorescent light bulbs	42%	29%	14%	15%
Use photo sensors to ensure outdoor lighting is not on in the daytime	32%	5%	21%	42%
Tip adoption percentage:	**48%**	**16%**	**17%**	**20%**

Note: Sample size for each tip was 66 users.

Influence on Energy Saving Tips Adoption

Users were also asked how much the Web site influenced their decision to adopt or their intention to adopt a given tip. Exhibit 6-7 below presents the percent of users who reported that the Web site was very influential (8 through 10 on a 1 to 10 scale) on their decision or intention to adopt a given tip. Overall, the Web site influenced about 60% of the measure adoptions and about 40% of the intentions to adopt. As a result, about 9% of all tips were adopted due to the influence of the Web site. Furthermore, another 7% of the energy saving tips are likely to be adopted within the year as a result of the Web site.

Exhibit 6-7
Influence on Adoptions of Residential Energy Saving Tips

Residential Energy Savings Tip	Adopted Tip Since Visiting Website	Percent Very Influenced by Website to Adopt		Plan to Adopt Tip within Year	Percent Very Influenced by Website to Adopt
In the winter, turn your thermostat down when your home is unoccupied	17%	73%		2%	100%
In the summer, turn your thermostat up when you leave your home	15%	60%		9%	33%
Consider installing an Energy Star® programmable thermostat	14%	56%		17%	27%
Consider installing an attic whole house fan	2%	0%		26%	53%
To heat your home, keep the shutters, drapes, and blinds on south-facing windows open during the day	18%	33%		12%	38%
During the cold winter months, close all shutters, drapes, and/or blinds at night	17%	45%		5%	33%
Move your refrigerator-freezer out from the wall for good air circulation and vacuum its condenser coils once a year	26%	65%		33%	36%
Use latex or silicone caulk to fill holes and cracks around windows	15%	40%		27%	44%
Consider using fluorescent light bulbs	29%	79%		14%	33%
Use photo sensors to ensure outdoor lighting is not on in the daytime	5%	100%		21%	50%
Influenced Tip Adoptions:	**9%**	**59%**		**7%**	**41%**

Of greatest note was the influence over using fluorescent light bulbs. Overall, 23% of the users were very influenced to adopt this tip, and of those that did adopt since visiting the Web site, 79% were very influenced.[10] The next most influenced adoption was moving and cleaning the coils of the refrigerator, for which 17% of the users were very influenced to adopt (65% of those that adopted since visiting the web site were very influenced). With regards to intentions, 14% of all users were very influenced by the Web site to intend on installing an attic whole house fan within the next year.

As with the results of the audit recommendations analysis, these results provide a good validation for the assumption for achievable potential of 5% adoption rate discussed in Section 6.2.

Improving Energy Saving Tips Adoption Rates and Energy Savings

In order to improve the potential achievable energy savings associated with the energy savings tips, we recommend revisiting and possibly revising the list of the 10 residential and business tips listed. For example, consider a measure that was a recommendation in the audit but not a top 10 tip, turning down the temperature on the water heater. Among those users surveyed

[10] It is important to note that some surveyed respondents received a free CFL for registering as a pilot user. These customers may have responded to adopting the fluorescent lighting tip as a result.

that received the audit recommendation to turn down their water heater temperature, 33% were very influenced to adopt or adopt within the next year. This measure was one of the more frequently recommended measures (62% of the time), meaning it is applicable to many users, and was a strong contributor to the overall savings potential associated with the audit (8% of the total therm savings potential across all low cost/no cost measures). However, forty-four percent of the users receiving this recommendation stated that they had already adopted this measure.

Compare this measure to the residential tip of closing all shutters, drapes and blinds during the winter. Sixty-eight percent of the users claimed having already adopted this measure, and only 9 percent were very influenced to adopt this tip or adopt it within the next year. Also, consider the tip of installing an attic whole house fan, which the audit tool claims to have negative savings (although this result was questioned in the discussion above).

However, due to the small sample sizes these analyses are based on, we would not make decisions based on these results at this time.

6.4.3 Impact On Purchases Due To Rebate Finder

The Rebate Finder and Manufacturer Links sections of the Web site provide information to customers interested in purchasing energy efficient equipment. Of the 76 users surveyed, 16 (21%) said they actually purchased energy efficient equipment as a result of visiting either the rebate finder tool, the manufacturer links, or both.

Exhibit 6-8
Users That Received Rebates for Purchasing Energy Saving Products Found Through the Rebate Finder Tool

	Residential	Business	Total
	9	2	11
Product Purchased with Rebate:			
Efficient Lighting	3	1	4
Refrigerator	4	0	4
Dishwasher	2	0	2
Water Heater	1	0	1
Washer/Dryer	1	0	1
Windows	1	1	2
Air Conditioner	1	0	1
Attic Insulation	1	0	1
Thermostat	1	0	1
Motion Detector	0	1	1
N	**70**	**6**	**76**

As Exhibit 6-8 shows, 11 people (14% of users) indicated that they had received rebates as a result of visiting the rebate finder, indicating customer interest in rebated equipment.

Exhibit 6-9
Users Influenced by the Manufacturer Links to Purchase Products

	Residential	Business	Total
	12	1	13
Products Purchased:			
Efficient Lighting	5	0	5
Thermostat	2	0	2
Refrigerator	2	0	2
Water Heater	1	0	1
Air Conditioner	1	0	1
Washing Machine	1	0	1
Light Sensors	1	0	1
N	**70**	**6**	**76**

Exhibit 6-9 shows that 17% of customers purchased equipment as a result of visiting the manufacturer links portion of the Web site.

Eight customers visited both the rebate finder tool and the manufacturer links on the Web site (50% of total purchasers). These customers took the time to research equipment and look for a rebate before making a purchase. The rebate finder tool and manufacturer links sections of the Web site complement each other; half of those who made purchases used these complementary elements in making their purchasing decision.

In addition, many customers purchased more than one item, demonstrating their interest in energy efficient equipment. Furthermore, these customers not only purchased inexpensive items like compact fluorescent bulbs; many were influenced to make more major purchases of larger appliances and equipment such as refrigerators and air conditioning equipment.

Of the 16 users who reported purchasing equipment as a result of manufacturer links, product information and the rebate finder, 6 users also claimed viewing the energy saving tips and adopting the tip that was related to the equipment they purchased. For example, one customer saw the tip about a programmable thermostat, claimed to have purchased a programmable thermostat since viewing the tip, and also reported being influenced to purchase the thermostat as a result of using the rebate finder. However, none of these 16 customers received audit recommendations. Therefore, it appears that the site has been successful in linking energy saving tips with product and manufacturer information, and information about rebates and energy efficiency programs. However, the site has not been as successful in linking audit recommendations to the rebate finder, product information or manufacturer links. We recommend explicitly placing links to the rebate finder (primarily) and product information (secondarily) on the energy saving tips page and in the audit report and emphasizing to the user that rebates and information are available on many of the tips and recommendations they are receiving.

6.4.4 Impact on Knowledge and Attitudes

Customers who participated in the survey were also asked a series of questions about their attitudes towards energy efficiency and conservation and asked to rank their knowledge of these topics. Their responses were compared between Web site users and non-users to try to gain a better understanding of the type of customer that visits the Web site. User responses to their knowledge before and after visiting the site were compared to determine the impact of the site on energy efficiency and conservation knowledge.

Exhibit 6-10
Attitudes on Energy Use

	User			Non-User		
	Residential	Business	Total	Residential	Business	Total
Credible information about saving energy is easy to find	3.37	3.83	3.41	3.67	3.52	3.60
I am well-informed about how to save energy in my home/business	3.96	4.33	3.99	4.11	3.98	4.05
I am aware of information about energy efficiency products offered by manufacturers	3.76	4.00	3.78	4.10	3.98	4.04
All this conservation stuff is just common sense	3.53	3.67	3.54	3.77	3.70	3.73
I've known all this conservation stuff for a long time	3.71	3.83	3.72	3.79	3.80	3.79
PG&E is a useful source of energy efficiency information	3.93	4.33	3.96	3.81	3.75	3.78
Media coverage of the energy crisis in the last year made me use energy more carefully	3.79	3.50	3.76	3.83	3.56	3.70
Total	70	6	76	150	150	300.00

*1= strongly disagree, 5=strongly agree

Exhibit 6-10 shows that Web site users believe themselves to be less aware of energy efficiency information than non-users believe themselves to be. Furthermore, users believe information about saving energy is more difficult to find, are less informed about how to save energy, are less aware of energy efficient products, and know less about energy conservation than non-users. Lack of information may explain why they visited the Web site: to become more knowledgeable about energy efficiency.

In addition, users feel PG&E is a useful source of energy efficiency information and have a more difficult time finding credible information about saving energy. Sixty percent of the users that strongly agreed that PG&E is a useful source of information also believed PG&E sponsored the Web site. Therefore, users may have been drawn to the site because they believed PG&E sponsored the site, and it would be a source of credible and useful information due to PG&E's sponsorship.

Exhibit 6-11
Knowledge of Conservation and Energy Efficiency

	User			Non-User		
	Residential	Business	Total	Residential	Business	Total
Before visiting web site	6.71	7.33	6.76	7.32	7.35	7.33
After web site visit	7.71	8.00	7.74	-	-	-
Total	70	6	76	150	150	300

* Scale from 1 to 10

Exhibit 6-11 similarly shows that before visiting the Web site, users were typically less knowledgeable about energy efficiency and conservation than non-users. Users showed a noticeable increase in their knowledge **after** they visited the site. This suggests that the Web site provided valuable information about energy efficiency and conservation to users, who did not consider themselves very well-informed about energy efficiency relative to customers that did not visit the site.

6.5 FINDINGS AND RECOMMENDATIONS

6.5.1 Findings

Overall, there is strong evidence that the Web site has had some influence over customer behavior, and that the Web site is capable of providing quantifiable energy savings.

Audit. The primary component of the Web site likely to generate savings and affect customer behavior is the audit. However, a limiting factor of the audit's potential is the relatively low number of customers that complete at least enough of the audit to get energy saving recommendations. Of the 403 residential users that registered with the site, only 10% received audit recommendations. Two barriers that have affected this low penetration are the login requirements and the request for users to enter historic billing information. By improving interest in the audit, overcoming concerns with registration and reducing the burden of entering historic billing data, the site may be more successful in providing significant energy savings. Although the audit was successful in influencing customers to adopt recommendations, usability interviews and web survey results indicated that some users felt the results were too general and not customized enough. For the most part, our analysis of the end use consumption and energy savings estimates generated by the audit appeared to be reasonable, but there were a few minor issues that should be reviewed. Finally, among the surveyed users that received audit recommendations, none used the rebate finder to obtain an incentive on a purchased product, indicating a lack of linkage between these areas of the Web site.

Energy Saving Tips. Another means by which the site is capable of generating significant energy savings and impacting customer behavior is through the energy saving tips provided on the site. Over 90% of the registered users that participated in the quantitative survey reported having viewed these tips. Therefore, by attracting more users to the Web site (users need not register to view the tips), the Web site can again generate more energy savings. Potential

savings associated with the tips could be improved by reviewing and revising the list of measures presented.

Rebate Finder and Product Information. We also found that the site was successful in providing information that led to customer adoptions through the rebate finder, product information and manufacturer links. Although difficult to quantify, these aspects of the site do influence customers to purchase energy efficient equipment. Of the 76 users surveyed, 16 (21%) said they actually purchased energy efficient equipment as a result of visiting either the rebate finder section of the Web site, the manufacturer links, or both. In fact, of the customers that used the rebate finder and made an energy efficient purchase, 73% also stated that they visited and were influenced by the product information and manufacturer links.

Furthermore, of the equipment that these 16 users reported purchasing as a result of manufacturer links, product information and the rebate finder, 6 users claimed that they were also influenced by an energy savings tip to purchase the same item. This would suggest that as a result of reading the tip, users proceeded to the rebate finder and product information in order to research the equipment and make a purchase. However, none of these 16 customers participated in the audit and did not receive audit recommendations. Therefore, it appears that the site has been successful in linking energy saving tips with product and manufacturer information, and information about rebates and energy efficiency programs. However, the site has not been as successful in linking audit recommendations to the rebate finder, product information or manufacturer links. We recommend letting customers know that there are rebates available related to many of the recommendations they are receiving by placing links to the rebate finder and project information in the audit report and also on the energy savings tips page.

Knowledge. We have also found that the site was successful in increasing customer knowledge about energy efficiency and conservation. Users showed a noticeable increase in their knowledge after they visited the site, implying that the Web site provided valuable information about energy efficiency and conservation. Furthermore, the findings from the quantitative survey found that customers were generally found the site useful (in particular the energy tips and recommendations) and felt it helped them manage their energy use and make decisions regarding energy efficiency.

6.5.2 Recommendations

With respect to the overall program portfolio of programs offered by the California IOUs, this program is well positioned as a gateway for customers to become better informed and more knowledgeable about energy efficiency and conservation measures, energy efficient products, and available energy efficiency program offerings. In addition to being an informational program, the Web site is capable of generating significant energy savings that can be directly attributable to the Web site. In the continuum of product adoption, the program is capable of generating awareness, knowledge, intentions and adoptions. However, although the program does have the potential to generate significant savings, it has yet to be determined if the site is capable of generating enough traffic to be considered primarily as a cost-effective energy savings program (i.e., one that has a TRC greater than one). We recommend that a focus of the year 2 evaluation be to further assess the ability of the Web site to generate energy savings after more customers have visited the site and completed the Home and Business Analyzer audits.

Audit. There are two obvious ways in which the Web site could generate greater energy savings. The first would be to increase the number of users that visit the site (and in particular the audit tool), and the second would be to increase customer adoption of audit recommendations (in particular) and energy saving tips. Two significant barriers to conducting enough of the audit to receive recommendations are the registration requirement and the request for entering historic billing data. Recommendations to overcome the registration requirement have been discussed in Section 3, Usability Research. The need for entering historic billing data could be eliminated by loading usage histories for all or targeted segments of PG&E's population.

As discussed above, one way in which adoption rates for the audit recommendations could be improved would be to ensure a level of customization and credibility with the recommendations. This could be achieved by getting customers to complete a greater portion of the audit (currently, only one quarter of customers that receive recommendations complete the entire audit). Furthermore, we recommend that the algorithms used to develop estimates of program savings be reviewed for a small number of measures, as discussed in Section 6.2. The more accurate these savings are, the more credibility the site lends itself, which ultimately leads to greater adoption of the recommendations.

Another way to increase adoption rates and increase user perception of the credibility of the recommendations may be to reduce the number of recommendations and attempt to minimize the number of recommendations that are already being implemented by customers. Currently users received an average of 24 recommendations (compared to only 6 for SCE's on-line home energy audit) and they claim to have already implemented 50% of the low cost/no cost measures being recommended.

As discussed above, we recommend considering reducing the number of recommendations a customer receives by eliminating those that have negative savings, excessively long payback periods, or very small associated savings. Alternatively, these measures could be placed at the end of the audit report and given less emphasis. Across all recommendations received by users, 4% had negative savings, 20% had payback periods that exceeded 10 years, 33% had savings estimates that were less than $5 per year, and over half had savings estimates that were less than $12 a year (or $1 per month on average). These types of recommendations, in particular those with negative savings or excessively long payback periods, will detract from the ability of this program to be considered a cost-effective energy savings program from a benefit-cost ratio (e.g., TRC) perspective.

This recommendation should be further investigated during the Year 2 evaluation, and included in the Usability Testing in particular.

Tips. One additional recommendation that may improve the adoption rates and energy savings attributable to the Web site would be to revisit and potentially revise the list of energy savings tips being provided. The research presented above has already illustrated that some tips had low adoption and influence rates compared to other low cost/no cost measures recommended in the audit.

It is important to note, however, that these findings and recommendations are based on very small sample sizes, and further research should be conducted before implementing any such recommendations. However, some of these findings are also consistent with the Usability

Testing, where users commented that the audit tool was not specific enough, and that they were frequently disappointed with the generalness of the information presented. Users believed that the tools would have value since they were customized to their own billing and housing information. Similarly, 5 of the 11 participants in the user survey that received recommendations also felt that the audit recommendations were too generic, and most (8) only somewhat agreed that the tips were credible (however, none disagreed).

Exhibit 6-12 summarizes these recommendation, organized by priority (1-5 scale, 5 highest), area of the Web site affected, and potential benefits or outcomes by implementing the recommendation.

Exhibit 6-12
Recommendations for Improvement

Severity	Recommendation	Benefits
Energy Audit Tool		
5	Increase customer adoption of audit recommendations by reducing number of recommendations and highlighting key recommendations in the audit report. Eliminate or de-emphasize recommendations that have negative savings, excessively long payback periods or very small savings. De-emphasize more generic recommendations that are likely to have already been adopted.	Improve Measure Adoption and Program Cost-Effectiveness
4	Link the rebate finder and product information to audit recommendations, which may lead to greater adoption of recommended measures.	Improve Measure Adoption
4	Pre-load historic billing information for all or targeted segments of the population. Both usability testing and WebTrends analysis revealed that this was a barrier to completing the audit.	Improve Audit Completion
3	Revisit the underlying algorithms used to model end use consumption and energy savings (discussed in Section 6.2) to provide more accurate estimates of potential savings. This lends to more credibility and greater adoption of the recommendations.	Improve Measure Adoption
3	Inform user of the benefits of completing the entire audit, such as more detailed recommendations and more accurate estimates of potential savings.	Improve Audit Completion
Rebate Finder		
4	Include additional links to locate rebates throughout the site, in particular with the energy saving tips, audit recommendations, and product information areas of the site.	Improve Measure Adoption
Energy Saving Tips		
4	Review and potentially revise the Top 10 list of residential and business energy savings tips to maximize the achievable energy savings potential from customer adoption.	Improve Energy Savings

7. CONCLUSIONS

This chapter integrates findings presented in the report and offers a set of technical and strategic recommendations.

7.1 SUMMARY OF FINDINGS

The Web site performed well. It is clear, well-organized and easy to navigate. Clickstream analysis suggests that two types of customers visit the Web site. Most are disinterested: 80% of users stay less than a minute, click once or twice, and exit. Twenty percent register with the Web site, explore the informational areas, claim their knowledge of energy efficiency is increased as result of their interaction, and are influenced to adopt energy-saving audit recommendations, tips, and products. The majority of registered users had a favorable impression of the Web site, felt it was very useful, and would recommend the site to others. Of all areas of the Web site, registered users rated viewing their energy usage history as the most useful and had the highest rate of satisfaction with this area, and it was the most important reason cited for visiting the site. The rebate finder area was also one of the most valuable areas of the site, but also one of the most difficult to find.

PG&E's challenge is to interest more users in the Web site – only 1.5% of 15,000 targeted customers registered with the site – and to persuade those visitors to interact more with the site's informational areas. Usability testing revealed that by far, the area that caused the most frustration for users was the Login feature of the site, and may be one the greatest barriers to more thorough interaction with the site.

This section summarizes findings in terms of the evaluation objectives listed in Exhibit 1-2.

Analysis of Web Site User Data

The Web site has attracted relatively few users. Only 1.5% Of the 15,000 targeted customers registered with the Web site. There were 1730 unique visitors in December and January. 313 of these visitors (18%) registered with site (cumulatively, there are over 600 to date, including 229 pilot users). About 80% of Web site visitors stay less than a minute. These visitors tend to land on the splash page, click once or twice, then exit. This user attrition might be explained by lack of customer interest and the login requirement, which was a barrier to use.

About 20% of visitors take the time to login and explore the site. The average visit duration is 11 minutes. Our survey of registered users finds that 90% viewed the tips, 10% received audit recommendations, and 21% bought energy-saving products as a result of the rebate finder and/or product and manufacturer information.

Return Visits. Forty percent of all unique visitors return to the site (WebTrends). The survey of registered users indicated that two-thirds visited the Web site 2-3 times. Indeed, 85% of registered users indicated they would return. In usability testing, most users said they would return to the site for additional information, particularly the rebate locator. Users also said they

would return to review their usage history over time, especially if they implemented any of the energy saving recommendations.

Manufacturer Links. Obtaining information about energy saving products was one of the most common areas of the Web site registered users claimed to have visited. Overall, 88% of surveyed registered users visited this area of the site, and 45% cited this as a reason for visiting the site. However, only 5% of registered users said this was the most important reason. Furthermore, 17% of registered users surveyed purchased equipment as a result of visiting the manufacturer links.

Kinds of Information that Users Look at

- **Cursory Visits[11]**. Less than 3% of visits accessed the key informational areas of the Web Site: the analysis tools, rebate opportunities, energy saving products, market information and energy saving tips. Many users dropped off the site after a few clicks. The analysis tools and energy-saving products were more popular with users than tips on energy savings, rebate opportunities, information on renewable energy and market information.

- **Low Audit Completion[12]**. Only 3% of registered residential users completed the entire audit. Of the users that started the audit, only 13% finished it.

- **Login as Barrier to Use**. Click path data indicates that customers dropped off login areas of the site (which house the analysis tools). Usability respondents said: "This is NOT what I was expecting. I don't like this. I just want to do research – I don't want to have to login – it should be optional." "I don't have to login to places just to get information."

Most Important Reason for Visit. Registered users indicated their most important reasons for visiting were to look at their energy usage history (24%), receive a free gift form the Home Depot (17%), get tips on energy savings (16%), and get an energy analysis (15%). Current energy news (0%), market information (0%) and renewable energy sources (3%) were not compelling reasons for visiting the Web site.

Most Visited Areas of Web Site. The survey of registered users shows that one-time visitors tended to visit energy saving tips (90%), energy calculators (80%), energy analysis (80%) and energy usage history (80%). Return visitors were most interested in tips (95%), energy saving products (93%). Registered users that made a repeat visit were least interested in energy (38%) and market news (36%). The greatest differential between one-time and return visitors was looking for rebate opportunities. Only 65% of one-time visitors accessed this area (lowest of all areas), compared to 82% of return visitors (third highest).

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[11] These visitation trends are based on all visitors to the site (WebTrends data).

[12] This analysis of Audit completion is based on registered users (not all site visitors).

User Satisfaction

Overall surveyed registered users had a very (24%) or somewhat (62%) favorable impression of the Web site. These respondents felt that overall the site was extremely (16%) or very (50%) useful. Those who gave the site a very favorable rating felt it was informative, useful and easy to navigate. Respondents who viewed the site as "somewhat favorable" agreed that it provided useful information, but some found the site complicated and hard to use. Over 75% of respondents stated that they would recommend the site to others.

In the web survey, registered users were asked about their satisfaction with the information they obtained from the Web site. One-time visitors were most satisfied with their energy usage history (4.10 on a 5 point scale), energy analysis (3.7), energy calculators (3.5), tips on energy savings (3.5), rebate opportunities (3.2), energy saving products (3.1). Information about renewables, market info and energy news were least satisfactory (3.0). Return visitors, on the other hand, were more satisfied with all web site features, including rebate opportunities (3.7), energy saving products (3.8) and market information (3.7).

Login Feature. Usability testing revealed that by far, the area that caused the most frustration for users was the Login feature of the site. Users were not clear why they would need to login on such a site, and many considered this requirement an obstacle to exploring the site further. In fact, users frequently commented that unless they knew why they would register on the site, they would most likely leave at this point.

- For some users, the login requirement damaged the credibility of the site.
  - "See that's how they get you – you have to sign up, they want your email address – to send you junk mail."
  - "If I'm looking for publicly available information, why are they asking for my information?"
  - "I feel kind of tricked. The site should have me login on the first page … not now that I've gotten this far in the process."

Audit Tool. Users were disappointed with the generalness of the FastTrack audit. In usability sessions, many commented that the recommendations were "common sense" and wanted more customized information. Several other sites offer similar information, including PGE.com, leaving californiaenergyconnection.com competing for what appears to be a small pool of interested users.

User Feedback on Web Site Enhancement

Requirements for Using Analysis Tools Not Clear. Requirements for using the Assessment tools are not communicated. The site does not clearly state that registration and previous bills are needed to use some of the tools. Users were not clear why they would need to login on such a site, and many considered this requirement an obstacle to exploring the site further.

Differentiate the analysis tools on the *Analyze Your Usage* page. Users were not clear on the difference between the choices on the *Analyze Your Usage* landing page (Usage History & Analysis, Home Energy Analysis, Home Energy Analysis FastTrack, Energy Calculators).

Nearly all users assumed they would complete a customized audit, using their own billing information, by clicking on the *Usage History and Analysis* link. No users in the study differentiated between the *Home Energy Analysis* and the *Fast Track.* As a result of this, many users first clicked on *Usage History and Analysis* to complete the first task (note the intended path was to click on the *Home Energy Analysis).* "Until I look I don't know the difference between the two. They overlap. I don't understand how History Usage and Analysis would be much different that Business Energy and Analysis."

More Customized Results. Usability research, focus groups and the user/non-user survey all found that customers wanted results to be personalized to the information they provide. Users in the usability study were interested in having the audit tools customizable (e.g., use their own billing data). Users were frequently disappointed with the generalness of the information presented to them after completing some of the audit tools, and said they considered that the tools would have value being *customized* to use their own billing/housing information. Often the recommendations given to users based on their input was considered to be general and non-specific.

Change the Step nomenclature. Users typically navigated the Web site by using the three main navigational areas on the page (Step 1, 2, 3) but were unclear on what each area would offer them. The "Steps" nomenclature in the *Analyze Your Usage* area is not intuitive to many users. The layout of the top level of the audit (Step 1, Analyze Your Usage; Step 2, Reduce Usage and Costs, Step 3, Energy Saving Products) implies a progression, but the three steps are independent and do not have to be completed in order As one user noted, "I didn't realize I could go to step 3 before doing step 1 and 2." Furthermore, WebTrends data indicates that Step 2 information – Tips on Energy Savings, Rebate Opportunities, and Information on Renewable Energy Sources – was the least popular section. This lack of visitation may be due to a usability issue – the Step nomenclature – not lack of customer interest.

My To Do List. While users considered the *My To Do List* interesting, many said they were not sure they would return to the site frequently enough to take advantage of such a feature.

Virtual Tour. Users almost always thought the *Virtual Tour* was a tour of an efficient building or home (not of the site).

Usefulness of the Web Site

Overall. Over 80% of registered users agreed that the Web site was useful to them, however only 16% found the site extremely useful. One-time visitors were more indifferent toward the Web site, whereas return visitors tended to believe the site was helpful in getting them to manage their energy use, and purchase energy efficiency equipment. Those that intend to return said they would most likely look for rebate opportunities (79%), look at their energy usage history (77%), get tips on energy savings (65%) or get an energy analysis (62%) in future visits. Likewise, usability testing found the California Energy Connection Web site informative and useful in terms of content. Users were frequently surprised with the functionality of the Web site, stating it was more interactive and useful than they had anticipated, based on the homepage (splash page).

Audit Tools (Energy Analysis, Fast Track, Usage History and Analysis)

- Of all areas of the Web site, registered users rated viewing their energy usage history as the most useful and had the highest rate of satisfaction with this are.

- Web survey respondents tended to view the audit recommendations as helpful, but many had already done most of the recommendations. They did not believe that implementing the recommendations would be easy.

- Users were unclear about the differences between the various audit tools (e.g., Fast Track versus Usage Analysis). Most considered these to be redundant.

- Users found the home audit tool to be informative and useful, even thought many commented it was not specific enough. Users were frequently disappointed with the generalness of the information presented to them after completing some of the audit tools, and said they considered that the tools would have value being *customized* to use their own billing/housing information. Often the recommendations given to users based on their input was considered to be general and non-specific.

Rebate Finder. The *Locate Rebate* feature was considered one of the most valuable tools on the Web site, although users had difficulty locating this tool (furthermore, 18% did not notice this area of the site). In usability sessions, most users said they would return to the site for additional information, particularly the rebate locator. Likewise, Web survey respondents were most likely to return to look for rebate opportunities. Return users found the rebate finder more useful than one-time visitors.

Energy Saving Products. In the web survey, return visitors rated product information as more useful than one-time visitors, a trend that is consistent with return visitors' interest in rebates for energy saving products.

Energy Calculators. The energy calculators were considered a valuable part of the Web site, although users had difficulty locating them. Web survey respondents (registered users) ranked the usefulness of energy calculators above market information, product information and rebate opportunities.

Market Information. Usability testing and Web survey both found that current headlines/electricity market info was least preferred part of site and would not bring users back. Not one user listed this as the most important reason for visiting the site, and it was the least visited area among registered users.

Web Site Focus Group Findings

PG&E commissioned several qualitative focus groups with customers to gain insight into content and functionality for the Web site. Focus group findings both confirm and conflict with findings uncovered from the usability testing. Usability and focus group respondents agreed that the rebate finder was a key reason for visiting the site, and said it should be highlighted more on the splash page.

However, in preliminary focus group research, respondents commented they would be unlikely to return to the site, whereas usability respondents claimed they were likely to visit the site in the future (note that once focus group users began to interact with the tools on the site they said they were far more likely to return to the site again). Usability respondents were less inclined to view PG&E sponsorship positively than focus group respondents. Differences in research methodology are likely to account for differences in results from conceptual focus groups and the usability interview feedback. Focus groups, held early in the Web development process, expose potential users to stimuli in a passive manner, whereas users actively interact with the site in a usability session. Consequently, variances occasionally exist in usability and focus group user preferences.

Changes in Behavior Regarding Energy Usage

Overall. There is strong evidence that the Web site has had some influence over customer behavior, and that the Web site is capable of providing quantifiable energy savings.

Audit Tools. The primary component of the Web site likely to generate savings and affect customer behavior is the audit. However, a limiting factor of the audit's potential is the relatively low number of customers that complete at least enough of the audit to get energy saving recommendations. Of the 403 residential users that registered with the site, only 10% received audit recommendations. By improving interest in the audit, overcoming concerns with registration and reducing the burden of entering historic billing data, the site may be more successful in providing significant energy savings. Although the audit was successful in influencing customers to adopt recommendations, usability interviews and web survey results indicated that some users felt the results were too general and not customized enough. For the most part, our analysis of the end use consumption and energy savings estimates generated by the audit appeared to be reasonable, but there were a few minor issues that should be reviewed. Finally, among the surveyed users that received audit recommendations, none used the rebate finder to obtain an incentive on a purchased product, indicating a lack of linkage between these areas of the Web site.

Energy Saving Tips. The site was also successful in impacting customer behavior by influencing customers to adopt energy saving tips provided on the site. Over 90% of the registered users that participated in the quantitative survey reported having viewed these tips. By attracting more users to the Web site (they need not register to view the tips), the Web site can again generate more energy savings. Potential savings associated with the tips could also be improved by reviewing and revising the list of measures presented.

Rebate Finder and Manufacturer Links/Product Information. The site was also successful in providing information that led to customer adoptions through the rebate finder, product information and manufacturer links. Over 20% of the users surveyed said they actually purchased energy efficient equipment as a result of visiting either the rebate finder section of the Web site, the manufacturer links, or both. In fact, of the customers that used the rebate finder and made an energy efficient purchase, 73% also stated that they visited and were influenced by the product information and manufacturer links. The site has also been successful in linking energy saving tips with product and manufacturer information, and information about rebates and energy efficiency programs. However, the site has not been as successful in linking audit recommendations to the rebate finder, product information or manufacturer links.

Knowledge. Users reported a noticeable increase in their knowledge after they visited the site, implying that the Web site provided valuable information about energy efficiency and conservation.

Branding and Sponsorship

Survey respondents tended to correctly identify the Web site sponsor as either PG&E (42%), the CPUC (30%) or the state of California (21%). Furthermore, nearly three-quarters of the registered users view PG&E a useful source of energy efficiency information. Because few (13%) users strongly agree that credible information about saving energy is easy to find, PG&E's sponsorship has likely added credibility to the information presented on the site.

Effectiveness of Incentive in Reaching Customers

Only 1.5% of 15,000 customers that were offered a Home Depot incentive for visiting the site did actually register with the website. Of those users, one-third did not avail the Home Depot gift. When surveyed, only 17% said their most important reason for visiting the site was to receive a free gift from the Home Depot (24% visited to look at their energy usage history, 16% for energy saving tips and 15% for an energy usage analysis). In sum, the Home Depot incentive did not seem to attract many users to the Web site.

7.2 RECOMMENDATIONS FOR IMPROVEMENT

This section offers high-level recommendations based on evaluation findings. The Web site can be improved by implementing several tactical suggestions made in the Heuristic Review and Usability Research. While these recommendations will further enhance the Web site, this assessment indicates that the site is technically sound. With a few exceptions, usability issues are not deterring visitors from navigating the site. Therefore, site enhancement should focus on broader strategic issues. PG&E's biggest challenge lies in driving traffic to the site and enticing visitors to stay and explore the site. PG&E rolled out the site in late 2002 and has just begun promoting this new site. Consequently, most customers are unaware of the website. PG&E's Year 2 efforts should focus on marketing and improving the site in a manner that entices visitors to explore the site.

Exhibit 7-1 integrates recommendation from the report. Each key issue was assigned both a category (Issue Type) as well as a rating (Severity) of how severe the issue is in relation to overall usability, as follows:

Severity – This represents the relative severity of issues, as we perceive them. Scale used is from 1 to 5, with 5 being very severe and 1 being not severe. The ratings are subjective in nature.

Issue type – Can be *strategic* or *tactical.*

Issue Area – Area the issue is related to.

Exhibit 7-1
Recommendations for Improvement

Severity	Issue Type (Strategic or Tactical)	Issue Area	Recommendation	Methodology
Site – Overall				
5	Tactical	**Marketing and Awareness**	Develop advertising materials that better explain what the Web site does. Only 1 in 5 of those aware of the site knew they could get energy efficiency information there. The relatively large proportion of non-users who were interested in a site where they could obtain energy efficiency information suggests that a stronger association between the Web site and energy efficiency information could significantly increase site traffic	User/non-user survey
5	Strategic	**Marketing and Awareness**	Target those with higher incomes and educational levels, as well as homeowners. These groups are more likely to engage in energy efficiency activities.	User/non-user survey
5	Strategic/ Tactical	**Marketing and Awareness**	Promote repeat usage of the site. Results presented should be personalized to user based on information provided by the user. Focus on developing tools that will incent the users to return to the site. Survey results suggest that repeat visitors use more areas of the site and should therefore have the potential realize greater energy savings that can be attributable to the site.	Usability Interviews User/non-user survey

Severity	Issue Type (Strategic or Tactical)	Issue Area	Recommendation	Methodology
4	Strategic	**Marketing and Awareness**	Consider interviewing a sample of the 15,000 pilot customers that did not register with the site to understand what does and does not drive customers to the site.	User/non-user survey
4	Strategic	**Marketing and Awareness**	Consider stronger co-branding or ties to PG&E.	User/non-user survey
3	Tactical	**Content**	Consider dropping lesser used areas of the site that are not related to energy efficiency. These include CA energy market information and Energy News	User/non-user survey
3	Tactical	**Content**	Offer seasonal tips in the sites "simple tips" section. Regularly refreshing the content will drive repeat visits	User/non-user survey
3	Tactical	**Content**	Consider presenting a more compelling case for the benefits of adopting the energy efficiency measures on the site. The site's helpfulness in managing energy use was one of the lowest rated areas.	User/non-user survey
2	Strategic	**Content/ Navigation**	Consider addressing specific audiences through additional content or navigation. If appropriate, provide resources for additional audiences such as teachers and the media. Consider adding features, such as games or quizzes, aimed at teaching children about wise energy usage. Allow the option to locate information based on the user type, such as energy-efficient products appropriate for students.	Heuristic
Site Expectations and Splash Page				
5	Strategic	**Marketing and Awareness**	Choose an alternative URL that is more intuitive for users to land on. Consider using a shorter, more memorable domain such as CalEnergy.com, EnergyCA.com. Cross-market Web site with pge.com as well as all other printed materials from PG&E to increase awareness of Web site and the benefits it offers customers. Work with manufacturers and other interested parties to leverage Web site URL cross-links. Promote the usage analysis and rebate finder components of the site as these were viewed as the most valuable aspects of the site, and why most visitors return.	Heuristic Usability Interviews User/Nonuser Survey

Severity	Issue Type (Strategic or Tactical)	Issue Area	Recommendation	Methodology
4	Tactical	**Layout/ Design**	Consider adding more graphical representation on homepage that will entice users to enter and explore. Users responded overall to images (including clickable links and images) more than text.	Usability Interviews
5	Tactical	**Content**	Add language to let users know they can receive rebates through the Web site, as this was, for most, a key reason for visiting the site and difficult to find. Consider even adding a link to the rebate finder directly on this page.	Usability Interviews User/Nonuser Survey
Homepage				
5	Strategic/ Tactical	**Registration Link**	Provide language on homepage enticing users to register on the site by letting them know the benefits of registration. (Additional registration recommendations are included in the next section of this report).	Usability Interviews
3	Tactical	**Content/ Virtual Tour**	Remove the virtual tour feature on the site entirely. Users more often than not were not clear on what this feature offered; and once users explored the area, many commented they would be unlikely to use such a feature. Having the link on the site only adds confusion and little benefit.	Usability Interviews
2	Tactical	**Messaging/ Navigation**	Incorporate the 3-Step metaphor, found on the home page, throughout the site. Consider adding a "1", "2", and "3" to the corresponding links in the left navigation bar, as well as on corresponding page headers.	Heuristic
2	Tactical	**Interface Design**	Revise the survey feature to be more in keeping with other, similar survey "widgets" on the Web. Change the button label from "Include My Vote" to the more conventional "Submit." After submitting a vote, refresh the page so that the results are immediately visible and do not require the user to scroll.	Heuristic
Site-Wide Elements				
4	Tactical	**Navigation**	Revise the design of the navigation system to ensure that it is consistent and in keeping with Web conventions. Design navigation "tabs" so that they behave similarly to those on other sites such as Amazon.com: use a static tabs order, and identify the active tab via color or other visual indicator. Make the user's location in the site visible at all times by highlighting the corresponding link in the left navigation bar. The highlighting design can incorporate a distinct text color, distinct background color, and/or bolded text. For example, if the user is within the residential area of the site, the business tab should be lighter color (not red). This highlighting design should be consistent across all sections and areas of the site.	Heuristic Usability Interviews

Severity	Issue Type (Strategic or Tactical)	Issue Area	Recommendation	Methodology
4	Tactical	**Nomenclature**	Change *Go* labels within each step to something more intuitive to users such as "begin" or "start." Change *Step* nomenclature to indicate to users they do not have to explore areas in succession. For example, add language such as "What do you want to do?" and add titles like "Analyze my current usage," "Learn how to reduce my current usage and save money," and "Find information on a product that will help me save energy." Add icons or graphical representation of what each area does instead of text describing the area – users do not read.	Usability Interviews
5	Tactical	**Interface Design**	Use HTML as the default display format whenever possible. Avoid use of PDF or other formats unless absolutely necessary.	Heuristic
5	Tactical	**Interface Design**	Use links consistently, and notify users if a link has a special behavior. If a link leads to an external site, opens in a new window, or opens a non-HTML page, include brief text or other visual cue to alert users to this. Examples found on other sites: - CNN.com:  - TDWaterhouse.com:  Code all pages so that the Web site logo functions as a link to the home page.	Heuristic
4	Tactical	**Navigation/ Interface Design**	Avoid excessive use of pop-up windows. Use pop-up windows only when it is beneficial that the user not "lose sight of" the page they are currently viewing. As noted in a previous recommendation, links within an analysis questionnaire would be an appropriate use of pop-up windows.	Heuristic
4	Tactical	**Interface Design**	Use a consistent "look and feel" across all pages in the site. Redesign areas, such as the Home Energy Analysis tool, which are not visually consistent with the rest of the Web site. Make use of a consistent overall look and feel, as well as navigation system, throughout the site.	Heuristic
3	Tactical	**Navigation**	When linking to external sites, make the link as "targeted" as possible. When linking to energy-efficient product manufacturers' sites, link to specific pages containing such products, rather than simply linking to the company's home page.	Heuristic

Severity	Issue Type (Strategic or Tactical)	Issue Area	Recommendation	Methodology
3	Tactical	**Information Design**	Design pages and text to facilitate easy reading and/or scanning. Headers which are used to divide sections of text should be brief and to the point, thus allowing users to quickly identify needed information. This recommendation applies to the Help section in particular. Use a large, easy-to-read font size throughout the site. Avoid using font colors that have little contrast with the background (such as in the Virtual Tour). Instead, use colors that have a high degree of contrast with the background.	Heuristic
Registration				
5	Strategic	**Functionality/ Content**	Completely revisit registration functionality by carefully considering the following: • Decide whether users really do need to register on the Web site to use features, and if so, impress upon users why this is so (give them a call to action) by clearly outlining the benefits of registration. Simply having a link to a privacy policy is not enough. • Allow the option to registration/save results once analysis is completed. • Consider offering an initial incentive or drawing for registering on the site to entice users to register. • Make registration process itself easier by eliminating confirmation/activation step. Users do not consider their electric bill "confidential" information enough to merit the extra it takes for this added step. • Consider offering users a box to check for opting out of receiving any marketing or communication from PG&E et al.	Heuristic Usability Interviews
Analysis Tools - Overall				
4	Strategic	**Messaging**	Communicate the benefits, distinctions, and requirements of each tool or feature. Clearly state the unique benefits of each analysis tool on the Analyze Your Usage page. Make careful use of descriptions to ensure that the distinct features/attributes of each tool are clearly communicated. Each tool's description should also make note of special requirements for use, such as registration or previous utility statements. Briefly state how much time and/or involvement is required for each tool's use. Provide a brief overview of the To-Do List feature prominently on the site. This overview should summarize the functionality offered and include brief instructions on how to use it.	Heuristic

Severity	Issue Type (Strategic or Tactical)	Issue Area	Recommendation	Methodology
4	Strategic	**Content**	Within usage analysis tools, make questionnaires intuitive and relevant to users' level of knowledge. Provide features to answer users' questions, such as links to more information about an item within the questionnaire. Opens each link within a popup, thus providing the supplementary information without drawing the user away from the task of completing the questionnaire.	Heuristic
3	Tactical	**Navigation**	Within each analysis tool, include a top progress bar shows the user's overall place in the process.	Heuristic
4	Tactical	**Marketing and Awareness**	Create stronger online cross linking to related sites and promotion. More than three-quarters of survey respondents were looking for energy efficiency sources online.	User/non-user survey
Energy Audit Tool				
c	Strategic	**Energy Savings/ Measure Adoption/ Cost-Effectiveness**	Increase customer adoption of audit recommendations by reducing number of recommendations and highlighting key recommendations in the audit report. Eliminate or de-emphasize recommendations that have negative savings, excessively long payback periods or very small savings. De-emphasize more generic recommendations that are likely to have already been adopted.	Impact Evaluation
3	Strategic	**Measure Adoption**	Revisit the underlying algorithms used to model end use consumption and energy savings (discussed in Section 6.2) to provide more accurate estimates of potential savings. This lends to more credibility and greater adoption of the recommendations.	Impact Evaluation
4	Strategic	**Energy Savings/ Measure Adoption**	Link the rebate finder and product information to audit recommendations, which may lead to greater adoption of recommended measures.	Impact Evaluation
4	Strategic	**Audit Completion**	Pre-load historic billing information for all or targeted segments of the population. Both usability testing and WebTrends analysis revealed that this was a barrier to completing the audit.	Heuristic Usability Interviews
4	Tactical	**Labeling/Nomenclature/ Content (Analyze Your Usage Landing Page)**	Rename links to allow users to clearly differentiate the differences of each link. Labels such as Home Energy Analysis Fast Track have no meaning to users, and specifically the term *analysis* implies to users they will be using their own billing data. Consider more descriptive labels such as "Comprehensive Home Energy Analysis down to the Appliance," and "Estimate your usage based on the size of your home".	Heuristic Usability Interviews

Severity	Issue Type (Strategic or Tactical)	Issue Area	Recommendation	Methodology
4	Tactical	**Content**	Let users know ahead of time how specific the analysis will be through less text. Consider a tag-line approach after the label of each link. For example, *"Estimate your usage: - Simply enter the size of your home to see how your usage compares to others."* Make use of bulleted lists to indicate to users what they will need when completing each type of analysis. For example, "in order to complete this analysis, you will need to have handy the following: • Your most recent bill • The square footage of your home	Heuristic Usability Interviews
4	Tactical	**Content**	Include clear verbiage to let users know that the analysis/information provided are *estimates* based on minimal information entered, particularly for the more general analysis features of the site (e.g., Fast Track).	Usability Interviews
3	Strategic	**Audit Completion**	Inform user of the benefits of completing the entire audit, such as more detailed recommendations and more accurate estimates of potential savings.	Heuristic Usability Interviews
3	Tactical	**Content (Fast Track results page)**	Eliminate example graphics not relevant to individual user as they cause confusion, and hold little value. Rather, clearly alert users that the information presented is general based on little input, and entice them to want to learn more. Include verbiage such as "Want more detail? Click here to enter more specific information." Remember to let users know, however, which information they will need to have on hand to complete such detailed forms.	Usability Interviews
4	Tactical	**Navigation**	Include indication such as asterisk to let users know which fields are required to move forward.	Usability Interviews
3	Strategic	**Audit tool**	Audit tool needs to incorporate a smoother transition from the Web site to the audit tool. Specifically, global navigational elements should be added to let the user know where they are both within the site, as well as within the audit process itself. For example… • Add interface that offers similar look and feel across top navigation (the labels are there, but the look and feel get lost within the tool, as the colors and layout of the links are light gray). Additionally, labels across top navigation bar need to be consistent throughout entire site. • Add a status bar at the top to let users know how far they are within the process and how much more they have to go. For example, "Step 1 of 3" coupled with a bar that shades in progressively lets uses know they are almost finished.	Heuristic Usability Interviews
5	Tactical	**Audit tool**	Add functionality that automatically refreshes the house and calculations once user completes each section (inputs data for each appliance).	Usability Interviews
3	Tactical	**Layout/ Design**	Change colors of information within forms so users clearly see drop down menus and choices (particularly in the audit tool). Alternately, eliminate (not just gray the text) options that are irrelevant to users.	Usability Interviews

Severity	Issue Type (Strategic or Tactical)	Issue Area	Recommendation	Methodology
4	Tactical	**Labeling**	Change Account Number field in business form to PG&E account number, and consider letting users know where they can find this number from their bill.	Heuristic Usability Interviews
4	Tactical	**Content**	Add functionality that retains information user entered in other site tools (e.g., fast track). For example, is user indicated they did not have central air conditioning, auto fill this information in all other forms.	Usability Interviews
3	Strategic	**Content**	Recommendations made based on Fast Track audit should be more specific rather than general. At a minimum, clearly indicate to users that the recommendations serve as a reminder for general energy conservation and to find out more specific areas where they can save, they should complete the comprehensive audit.	Usability Interviews
Calculators				
3	Tactical	**Information hierarchy**	Calculators were considered a good resource to users and a reason to return to the site. Add more links to the calculators in areas of the site that make sense, such as within fact sheets.	Usability Interviews
Rebate Finder				
4	Tactical	**Information hierarchy**	Include additional links to locate rebates throughout the site, in particular with the energy saving tips, audit recommendations, and product information areas of the site. Add verbiage on homepage indicating to users this is a feature on the site as users considered this a key reason to return in the future.	Usability Interviews User/Nonuser Survey Impact Evaluation
4	Tactical	**Content**	Only show rebates for which user is eligible for (e.g., by zip code).	Usability Interviews
4	Strategic	**Content**	Since users consider the rebate finder a key reason to return to the site, consider leveraging this feature in areas that users are less receptive to. For example, consider including rebates as a benefit for registering with the site (e.g., "you can choose to be notified when a rebate becomes available for your home.")	Usability Interviews
Usage History and Analysis				
4	Tactical	**Labeling**	Provide more information to users before asking them how they would like to view the data (e.g., graph versus numbers). For example, provide users with a one sentence description of what the feature is.	Usability Interviews
4	Strategic	**Content**	Since users cited as this as the most important reason for visiting the site, and had the highest satisfaction and usefulness rating, consider leveraging this feature in areas that users are less receptive to. For example, consider including rebates as a benefit for registering with the site (e.g., "you can choose to be notified when your usage history is updated.")	User/Nonuser Survey
4	Tactical	**Content**	Inform users upfront that in order to complete the analysis they will need to have handy past bills.	Usability Interviews

Severity	Issue Type (Strategic or Tactical)	Issue Area	Recommendation	Methodology
4	Strategic	**Content/ Usage History**	Consider functionality that grabs user billing data from PG&E database so user does not have to keep track. (Note: This may also entice users to return to the site in the future, and to register.)	Usability Interviews
3	Tactical	**Content**	Provide users with more specific recommendations if possible, related to the unique data they have entered.	Usability Interviews
Locate Manufacturer				
4	Tactical	**Content**	Add language to indicate manufacturers are not endorsed by PG&E, and that they do not pay a fee to be listed on the site. Consider letting users know how/why those listed are on the site (versus others).	Usability Interviews
4	Strategic	**Awareness**	Develop relationship marketing with manufactures to include links on their Web sites to the California Energy Connection Web site.	Usability Interviews
3	Tactical	**Content**	Strengthen ties to manufacturers to more effectively present energy efficient products. The site's helpfulness in making energy efficiency product decisions was the lowest rated area.	User/non-user survey
Energy Savings Tips				
4	Strategic	**Energy Savings**	Review and potentially revise the Top 10 list of residential and business energy savings tips to maximize the achievable energy savings potential from customer adoption.	Impact Evaluation
My To Do List				
4	Tactical/ Strategic	**Content**	Eliminate feature from the site – most users are not interested and do not consider it reason to return to the site.	Usability Interviews
Virtual Tour				
4	Tactical/ Strategic	**Content**	Eliminate feature from the Web site. Users were unclear what the feature offered, and even when explored commented they would be more likely to use a site map to view site content. Additionally, users in general explore sites by "trial and error," versus taking time to review virtual tours.	Usability Interviews

APPENDICES

APPENDIX A
PG&E User/Non-User Survey

[ALL DIRECTIONS IN CAPITAL LETTERS ARE PROGRAMMING AND LOGIC INSTRUCTIONS. THESE WILL NOT BE VISIBLE TO SURVEY RESPONDENTS]
Survey Name: Energy Efficiency Survey **[NAME TO APPEAR ON ALL SCREENS]**
[FORCE RESPONSES TO ALL QUESTIONS UNLESS OTHERWISE SPECIFIED]
[ADD STATUS BAR TO EACH PAGE]
Quota: 600 Completed Interviews
Sample Cells: Cell 1: Residential users (150)
Cell 2: Residential non-users (150)
Cell 3: Commercial users (150)
Cell 4: Commercial non-users (150)

Sample Source: Client list and Forum

Introduction Screen

Thank you for taking the time to participate in this survey. This survey is easy to complete and should take no more than 20 minutes of your time. As a thank you for participating, everyone who completes the survey will receive a $10 gift certificate from Amazon.com.

All Information Will Remain Confidential
Socratic Technologies, Inc., a market research firm that specializes in Web-based research, is conducting this survey. Your answers will be kept strictly confidential. Your name will not be given, sold, or traded to anyone, and no information about you will be released to anyone. Your answers will be combined with hundreds of other people's answers and only reported in total. We are simply interested in hearing your opinions

How to Complete the Survey
To record your responses, either type your answer in the space provided or select/click on the box (using your mouse) that corresponds to your answer choice. When the answer choices have a box next to them, you may "check" all that apply. When the answer choices have round buttons next to them, you will only be able to select one answer. Other questions require you to type a number or a text response into the space provided.

Whom to Contact with Questions
If at any point you have questions about the survey, please contact the Project Director, Alyssa Freeman at Socratic Technologies. Alyssa's email address is alyssa.freeman@al.sotech.com. She can also be reached Monday-Friday, 9am-5pm (Pacific Standard Time) at 1-800-5-SOCRATIC (1-800-576-2728) or 1-415-430-2200. When responding, please refer to the project number 466-001.

WE HOPE THAT YOU ENJOY THE SURVEY!

Begin the survey and record your participation by entering your email address. Please note that your email address will only be used for the purpose of sending you the gift certificate. You will not be contacted for any other reason.

Email: _____

[SEEDED DATABASE FROM CLIENT LIST]

----------*Screen Break*----------

QUESTIONNAIRE

[IF CELL = 2 OR 4, SKIP TO Q19, ELSE ASK Q1]

Q1 How did you find out about californiaenergyconnection.com?

Please select only one.

Printed on utility bill 1
A print advertisement 2
A friend, colleague or family member recommendation 3
A link or banner ad on another Web site 4
Internet search engine 5
PGE.com 6
Received notice in mail 7
Other, please specify **[TEXT BOX]** 8
I'm not sure/Don't remember 9

----------*Screen Break*----------

Q2 Approximately how many times have you visited californiaenergyconnection.com?

Please select only one.

1 time 1
2-3 times 2
4-5 times 3
6-9 times 4
10 times or more 5

Q3 Did you visit californiaenergyconnection.com to seek information for your home or business?

Please select only one.

Home 1
Business 2
Both 3

----------*Screen Break*----------

Q4 Which of the following statements describes your reason(s) for visiting californiaenergyconnection.com?

Please select all that apply.

[RANDOMIZE LIST]

_1 Look at my energy usage history
_2 Get an energy analysis
_3 Use energy calculators to see the costs of various appliances
_4 Get tips on energy savings
_5 Look for rebate opportunities
_6 Find out about renewable energy sources
_7 Learn about energy-saving products
_8 Get information about the California energy market
_9 See current news about energy
_10 Receive a free gift from The Home Depot®
_11 Other, please specify **[TEXT BOX]**

[IF COUNT Q4=1 THEN SKIP TO Q6 & WRITE CODE TO Q5; ELSE CONTINUE]

----------*Screen Break*----------

Q5 Of these reasons, which one is the <u>most</u> important reason for your visit to Web site?

Please select only one.

[PIPE Q4 RESPONSES]

Look at my energy usage history.....1
Get an energy analysis 2
Use energy calculators to see the costs of various appliances 3
Get tips on energy savings 4
Look for rebate opportunities.....5
Find out about renewable energy sources.....6
Learn about energy-saving products 7
Get information about the California energy market.....8
See current news about energy.....9
Receive a free gift from The Home Depot® 10
[PIPE TEXT FROM Q4_11] 11

----------*Screen Break*----------

Q6 How would you rate your overall impression of californiaenergyconnection.com?

Please select only one.

Very Favorable.....5
Somewhat Favorable.....4
Neither Favorable Nor Unfavorable.....3
Somewhat Unfavorable.....2
Very Unfavorable.....1

Q7 Why did you say that?

Please be as specific as possible.

[TEXT BOX; DO NOT FORCE]

----------*Screen Break*----------

Q8a Using a scale of 1 to 5, where a 1 means "not at all useful" and a 5 means "extremely useful," please **rate how useful you found these activities**. If you did not perform a particular activity, select "Did not do this" for that activity.

Please select one for each item.

[SHOW SCALE VALUES]

Extremely useful				Not at all useful	Did not do this
5	4	3	2	1	6

[RANDOMIZE. ALWAYS KEEP _1 FIRST]

_1 The site overall
_2 Look at my energy usage history
_3 Get an energy analysis and custom savings recommendations
_4 Use energy calculators to see the costs of various appliances
_5 Get tips on energy savings
_6 Look for rebate opportunities
_7 Find out about renewable energy sources
_8 Learn about energy-saving products
_9 Get information about the California energy market
_10 See current news about energy

[IF COUNT (Q8A=6)=10, SKIP TO 10B, ELSE CONTINUE]

----------*Screen Break*----------

Q8b Using a scale of 1 to 5, where a 1 means “not at all easy” and a 5 means “extremely easy,” please **rate your level of difficulty completing** each of the following activities

Please select one for each item.

[SHOW SCALE VALUES]

Extremely easy				Not at all easy
5	4	3	2	1

_2 Look at my energy usage history **[PIPE IF Q8A_2<6]**
_3 Get an energy analysis **[PIPE IF Q8A_3<6]**
_4 Use energy calculators to see the costs of various appliances **[PIPE IF Q8A_4<6]**
_5 Get tips on energy savings **[PIPE IF Q8A_5<6]**
_6 Look for rebate opportunities **[PIPE IF Q8A_6<6]**
_7 Find out about renewable energy sources **[PIPE IF Q8A_7<6]**
_8 Learn about energy-saving products **[PIPE IF Q8A_8<6]**
_9 Get information about the California energy market **[PIPE IF Q8A_9<6]**
_10 See current news about energy **[PIPE IF Q8A_10<6]**

----------*Screen Break*----------

Q9 Using a scale of 1 to 5, where a 1 means “very dissatisfied” and a 5 means “very satisfied,” how satisfied were you with **the information you obtained** from each of the following:

Please select one for each item.

[DO NOT SHOW SCALE VALUES]

Very Satisfied	Somewhat Satisfied	Neither Satisfied nor Dissatisfied	Somewhat Dissatisfied	Very Dissatisfied
5	4	3	2	1

_2 Look at my energy usage history **[PIPE IF Q8A_2<6]**
_3 Get an energy analysis **[PIPE IF Q8A_3<6]**
_4 Use energy calculators to see the costs of various appliances **[PIPE IF Q8A_4<6]**
_5 Get tips on energy savings **[PIPE IF Q8A_5<6]**
_6 Look for rebate opportunities **[PIPE IF Q8A_6<6]**
_7 Find out about renewable energy sources **[PIPE IF Q8A_7<6]**
_8 Learn about energy-saving products **[PIPE IF Q8A_8<6]**
_9 Get information about the California energy market **[PIPE IF Q8A_9<6]**
_10 See current news about energy **[PIPE IF Q8A_10<6]**

[IF ALL Q8a_2 THROUGH Q8a_10<6, SKIP TO Q10A]

----------*Screen Break*----------

Q10a You mentioned that you <u>did not use</u> the following functions on the Web site. Did you **<u>notice these items</u>** on the Web site?

Please select one for each item.

[DO NOT SHOW SCALE VALUES]

		Noticed	Didn't Notice
		1	2
_2	Look at my energy usage history	**[PIPE IF Q8a_2=6]**	
_3	Get an energy analysis	**[PIPE IF Q8a_3=6]**	
_4	Use energy calculators to see the costs of various appliances	**[PIPE IF Q8a_4=6]**	
_5	Get tips on energy savings	**[PIPE IF Q8a_5=6]**	
_6	Look for rebate opportunities	**[PIPE IF Q8a_6=6]**	
_7	Find out about renewable energy sources	**[PIPE IF Q8a_7=6]**	
_8	Learn about energy-saving products	**[PIPE IF Q8a_8=6]**	
_9	Get information about the California energy market	**[PIPE IF Q8a_9=6]**	
_10	See current news about energy	**[PIPE IF Q8a_10=6]**	

----------*Screen Break*----------

Q10b Do you plan to visit this site again?

Please select only one.

Yes.....1
No 2

Q10c Why or why not?

Please be as specific as possible.

[TEXT BOX; DO NOT FORCE]

[IF Q10B = 2 THEN SKIP TO Q12a, ELSE CONTINUE]

----------*Screen Break*----------

Q11 Which parts of the site will you return to?

Please select all that apply.

[DO NOT ALLOW _11 AND ANY OTHER RESPONSE]

_2 Look at my energy usage history
_3 Get an energy analysis
_4 Use energy calculators to see the costs of various appliances
_5 Get tips on energy savings
_6 Look for rebate opportunities
_7 Find out about renewable energy sources
_8 Learn about energy-saving products
_9 Get information about the California energy market
_10 See current news about energy
_11 Not sure

----------*Screen Break*----------

Q12a Please indicate how strongly you agree or disagree with the following statements regarding californiaenergyconnection.com.

Please select one for each item.

[DO NOT SHOW SCALE VALUES]

Strongly Agree	Somewhat Agree	Neither Agree nor Disagree	Somewhat Disagree	Strongly Disagree
5	4	3	2	1

[RANDOMIZE]

_11 This Web site is interesting
_12 This Web site is easy to navigate
_13 This Web site is hard to understand
_14 This Web site looks appealing
_15 This Web site is useful to me
_16 This Web site loads quickly and easily
_17 I would recommend this site to others
_18 I would bookmark this site
_19 It was hard to get the information I was looking for
_20 The Web site is laid out well
_21 The energy-saving tips and recommendations are credible information
_22 Overall, the Web site was helpful in getting me to manage my energy usage
_23 This Web site was helpful in getting me to make decisions regarding purchasing energy efficiency equipment

Q12b Who do you think sponsors this Web site?

Please select only one.

[RANDOMIZE]

The State of California 1
Southern California Edison 2
Pacific Gas & Electric 3
Manufacturers of appliances or industrial equipment 4
San Diego Gas & Electric Company 5
A consumer watchdog group 6
California Public Utility Commission 7
A for-profit energy services company 8
Someone else 9

----------*Screen Break*----------

Q13 Are there any other types of information or services that would be helpful to you that you would like to see on this Web site?

Type your response in the space provided; please be as specific as possible.

[TEXT BOX; DO NOT FORCE]

[IF USER GOT RECS, CONTINUE
ELSE IF Q8A_5<>6, SKIP TO Q17A
ELSE IF Q8A_5 = 6 AND Q8A_6<6 SKIP TO Q18A
ELSE SKIP TO Q18B]

----------*Screen Break*----------

I already implemented this recommendation before visiting the Web site	I have implemented this Recommendation	I plan to implement this recommendation in the next 6 months	I plan to implement this recommendation in the next 6 to 12 months	I do not plan to implement this recommendation
5	4	3	2	1

_1 Avoid cooling unoccupied areas **[PIPE IF CL1=1]**
_2 Raise your thermostat settings of your air conditioner **[PIPE IF CL2=1]**
_3 Close drapes and shades during the cooling season to reduce the heat from the sun **[PIPE IF CL3=1]**
_4 Properly maintain your central air conditioning system **[PIPE IF CL6=1]**
_5 Use whole house fan more **[PIPE IF CL8=1]**
_6 Use your attic fan more **[PIPE IF CL9=1]**
_7 Replace your central air conditioner with a more efficient system **[PIPE IF CL10=1]**
_8 Regularly maintain your room air conditioner(s) **[PIPE IF CL12=1]**
_9 Replace your room air conditioner with a more efficient unit **[PIPE IF CL14=1]**
_10 Raise the temperature setting of your room air conditioner **[PIPE IF CL15=1]**
_11 Manually defrost your freezer on a regular basis **[PIPE IF FS1=1]**
_12 Replace your freezer with a more efficient freezer **[PIPE IF FS2=1]**
_13 Mover your freezer to a cooler temperature room **[PIPE IF FS3=1]**
_14 Regularly maintain your freezer and clean the coils **[PIPE IF FS4=1]**
_15 Raise temperature setting of your freezer **[PIPE IF FS5=1]**
_16 Turn off the moisture control heater of your freezer **[PIPE IF FS6=1]**
_17 Manually defrost your refrigerator on a regular basis **[PIPE IF FS7=1]**
_18 Properly maintain your refrigerator and clean the coils **[PIPE IF FS8=1]**
_19 Raise the temperature setting of your refrigerator **[PIPE IF FS9=1]**
_20 Turn off your second refrigerator when you're not using it or eliminate it **[PIPE IF FS10=1]**
_21 Move your spare refrigerator to a cooler location **[PIPE IF FS11=1]**
_22 Replace your refrigerator with a more efficient model **[PIPE IF FS13=1]**
_23 Lower the thermostat setting of your heater **[PIPE IF HT1=1]**
_24 Avoid heating unoccupied areas **[PIPE IF HT2=1]**
_25 Turn off pilot light of your heater during summer **[PIPE IF HT4=1]**
_26 Regularly maintain your heating system **[PIPE IF HT5=1]**
_27 Insulate pipes used to heat your home **[PIPE IF HT13=1]**
_28 Upgrade heating system **[PIPE IF HT15=1]**
_29 Replace your heating system with a more efficient system **[PIPE IF HT16=1]**
_30 Install Flue Damper on your furnace **[PIPE IF HT20=1]**
_31 Install Electronic Ignition on your furnace **[PIPE IF HT21=1]**
_32 Replace Oil Nozzle on your furnace **[PIPE IF HT22=1]**
_33 Replace Oil Burner on your furnace **[PIPE IF HT23=1]**
_34 Install Outdoor Reset Control on your water heater **[PIPE IF HT24=1]**
_35 Install a circulating fan control on your heater **[PIPE IF HT25=1]**
_36 Install an add-on hydro-air system on your heater **[PIPE IF HT26=1]**

_37 Install an Add-on Heat Pump **[PIPE IF HT27=1]**
_38 Turn lights off when you're not using them **[PIPE IF LT1=1]**
_39 Use compact fluorescent lamps in high-use lamps **[PIPE IF LT3=1]**
_40 Replace halogen torchiere with compact fluorescent torchiere **[PIPE IF LT4=1]**
_41 Use compact fluorescent lamps in recessed fixtures **[PIPE IF LT7=1]**
_42 Make up your waterbed every day **[PIPE IF OA6=1]**
_43 Lower the temperature of your waterbed **[PIPE IF OA7=1]**
_44 Insulate the sides and bottom of your waterbed **[PIPE IF OA8=1]**
_45 Replace your waterbed with a non-heated conventional bed **[PIPE IF OA9=1]**
_46 Turn off your computer when not in use **[PIPE IF OA10=1]**
_47 Lower the water temperature of your hot tub **[PIPE IF PS1=1]**
_48 Use your hot tub cover regularly **[PIPE IF PS2=1]**
_49 Lower the temperature of your pool **[PIPE IF PS4=1]**
_50 Run your pool pump less **[PIPE IF PS5=1]**
_51 Replace the pump motor with a more efficient unit **[PIPE IF PS6=1]**
_52 Install a solar heating loop for your pool **[PIPE IF PS7=1]**
_53 Use your pool cover more often **[PIPE IF PS8=1]**
_54 Use your pool cover regularly **[PIPE IF PS9=1]**
_55 Replace the windows in your home with energy efficient windows **[PIPE IF WE1=1]**
_56 Caulk windows and doors to prevent drafts **[PIPE IF WE3=1]**
_57 Insulate your air ducts **[PIPE IF WE4=1]**
_58 Improve attic, wall or foundation insulation **[PIPE IF WE5=1]**
_59 Seal leaks in air ducts **[PIPE IF WE6=1]**
_60 Install exterior solar screens on windows **[PIPE IF WE7=1]**
_61 Wash full loads of clothes when possible **[PIPE IF WH1=1]**
_62 When not washing full loads of clothes match the load setting to the size of the load **[PIPE IF WH2=1]**
_63 Use cooler temperature water for clothes wash and rinse **[PIPE IF WH3=1]**
_64 Replace your clothes washer with a horizontal axis (side loading) **[PIPE IF WH4=1]**
_65 Wash full loads of dishes when possible **[PIPE IF WH5=1]**
_66 Air dry dishes **[PIPE IF WH7=1]**
_67 Replace dishwasher with a more efficient unit **[PIPE IF WH9=1]**
_68 Lower the temperature setting of your water heater **[PIPE IF WH10=1]**
_69 Wrap your water heater with an insulating blanket **[PIPE IF WH11=1]**
_70 Install efficient faucet heads (aerators) on bathroom and kitchen sinks **[PIPE IF WH12=1]**
_71 Install low flow showerheads **[PIPE IF WH13=1]**
_72 Take shorter showers **[PIPE IF WH14=1]**
_73 Turn off the water heater when away from home for a week or more **[PIPE IF WH15=1]**
_74 Properly maintain your water heater **[PIPE IF WH16=1]**
_75 Install heat traps for your water heater **[PIPE IF WH17=1]**
_76 Insulate hot water pipes for your water heater **[PIPE IF WH19=1]**
_77 Replace your water heater with a more Efficient model **[PIPE IF WH22=1]**

_78 Control your water heater with a timer **[PIPE IF WH23=1]**
_79 Install a heat recovery water heating system **[PIPE IF WH24=1]**
_80 Dry full loads of clothes when possible **[PIPE IF WH91=1]**
_81 Avoid over drying clothes **[PIPE IF WH92=1]**
_82 Replace dryer with more efficient model **[PIPE IF WH94=1]**
_83 Reduce the amount of time you water your lawn **[PIPE IF WT1=1]**
_84 Repair your leaking faucets **[PIPE IF WT2=1]**
_85 Repair your leaking shower heads **[PIPE IF WT3=1]**
_86 Use your evaporative cooler "bleed off" water **[PIPE IF WT4=1]**
_87 Use soaker hoses on your garden **[PIPE IF WT5=1]**
_88 Replace grass with low-water use plants **[PIPE IF WT6=1]**
_89 Repair your leaking toilets **[PIPE IF WT7=1]**
_90 Install low flush toilets **[PIPE IF WT8=1]**
_91 Replace electric oven with a convection oven **[PIPE IF COOK1=1]**
_92 Use electric induction cooktops **[PIPE IF COOK2=1]**
_93 Use instant heat electric char-broilers **[PIPE IF COOK3=1]**
_94 Use infrared power burner fryers **[PIPE IF COOK4 =1]**
_95 Raise thermostat in summer when cooling and/or install programmable thermostat **[PIPE IF COOL1=1]**
_96 Install evaporative condensers **[PIPE IF COOL10=1]**
_97 Remove VAV inlet guide vanes and install variable speed drives **[PIPE IF COOL11=1]**
_98 Install a variable air volume (VAV) system **[PIPE IF COOL12=1]**
_99 Implement Differential Enthalpy Controls for Economizers **[PIPE IF COOL13=1]**
_100 Check for compressed air system leaks **[PIPE IF COOL14=1]**
_101 Install compressor demand controls **[PIPE IF COOL15=1]**
_102 Regularly service your cooling system **[PIPE IF COOL2=1]**
_103 Reduce cooling loads when unoccupied **[PIPE IF COOL3=1]**
_104 Replace air filters every season **[PIPE IF COOL4=1]**
_105 Install high efficiency chillers **[PIPE IF COOL5=1]**
_106 Install high efficiency air conditioner **[PIPE IF COOL6=1]**
_107 Replace your HVAC fan motor **[PIPE IF COOL7=1]**
_108 Implement a variable speed drive for your chiller **[PIPE IF COOL8=1]**
_109 Install Economizers for your air conditioner **[PIPE IF COOL9=1]**
_110 Decrease the temperature of your water heater **[PIPE IF DWH1=1]**
_111 Install Time Clocks with water heaters **[PIPE IF DWH2=1]**
_112 Insulate your water heater **[PIPE IF DWH3=1]**
_113 Install a heat pump water heater **[PIPE IF DWH4=1**]
_114 Use waste heat recovery strategy **[PIPE IF DWH5=1]**
_115 Use a water temperature booster for dishwashing **[PIPE IF DWH6=1]**
_116 Turn off equipment when not in use **[PIPE IF EQUIP1=1]**
_117 Use equipment with the Energy Star® logo **[PIPE IF EQUIP2=1]**
_118 Use power-down cash registers **[PIPE IF EQUIP3=1]**
_119 Use automatic power-down and power-up product scanners **[PIPE IF EQUIP4=1]**

_120 Lower thermostat in winter to heat and/or install programmable thermostat **[PIPE IF HEAT1=1]**
_121 Reduce heating load during unoccupied hours **[PIPE IF HEAT2=1]**
_122 Replace your old furnace with a pulse-fired furnace **[PIPE IF HEAT3=1]**
_123 Check for leaking ducts and seal them **[PIPE IF HEAT5=1]**
_124 Regularly service your heating system **[PIPE IF HEAT6=1]**
_125 Install high efficiency heating units **[PIPE IF HEAT7=1]**
_126 Install heat pumps **[PIPE IF HEAT8 =1]**
_127 Install controls to optimize start/stop cycles **[PIPE IF HEAT9=1]**
_128 Retrofit with T-8 Fluorescent Lighting **[PIPE IF LT1=1]**
_129 Replace incandescent lamps with compact fluorescent lamps **[PIPE IF LT3=1]**
_130 Retrofit with HID (high intensity discharge) exterior lights **[PIPE IF LT4=1]**
_131 Replace mercury vapor lamps with metal halide lamps **[PIPE IF LT5=1]**
_132 Retrofit your exit signs with energy-efficient light sources **[PIPE IF LT6=1]**
_133 Use fluorescent lamps in task light fixtures **[PIPE IF LT7=1]**
_134 Use day lighting on peripheral areas exposed to outside light **[PIPE IF LT8=1]**
_135 Use discharge lamps for display lighting **[PIPE IF LT9=1]**
_136 Use energy-efficient motors in refrigeration display cases **[PIPE IF REF1=1]**
_137 Use Gas defrost instead of Electric defrost **[PIPE IF REF2=1]**
_138 Clean heat exchanger coils regularly **[PIPE IF REF3=1]**
_139 Use Protocol Refrigeration Units **[PIPE IF REF4=1]**
_140 Install variable speed compressors **[PIPE IF REF5=1]**
_141 Install an integrated refrigeration/HVAC system with Heat Recovery **[PIPE IF REF6=1]**
_142 Utilize refrigeration case covers **[PIPE IF REF7=1]**
_143 Check for and seal cracks around windows and doors **[PIPE IF SHELL1=1]**
_144 Add Rigid Insulation to reduce heating and cooling demand **[PIPE IF SHELL2=1]**
_145 Add Attic Insulation to reduce heating and cooling demand **[PIPE IF SHELL3=1]**
_146 Install insulation above a dropped ceiling **[PIPE IF SHELL4=1]**
_147 Decrease summer heat gain by installing window film **[PIPE IF SHELL5=1]**
_148 Install exterior shading devices **[PIPE IF SHELL6=1]**
_149 Install air infiltration barriers or loading-dock seals **[PIPE IF SHELL7=1]**

----------*Screen Break*----------

Q14b Please tell me on a 1 to 10 scale, how much the website influenced your decision to implement each recommendation, where 1 means “not at all influential”, and 10 is “very influential”.

1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**

[PIPE ALL Q14a ITEMS <> 1 or<>5]

----------*Screen Break*----------

Too expensive	Too much hassle	I don't know enough about the equipment/technology	I have already done this	Some other reason
1	2	3	4	5

----------*Screen Break*----------

Please select one for each item.

[DO NOT SHOW SCALE VALUES]

Strongly Agree	Somewhat Agree	Neither Agree nor Disagree	Somewhat Disagree	Strongly Disagree
5	4	3	2	1

_24 Overall, these recommendations were very helpful
_25 The recommendations were too generic
_26 I was very satisfied with the recommendations
_27 I already know to do these recommendations
_28 I've already done most of the recommendations
_29 The measures/technologies recommended are produced by companies I know
_30 I know where I can purchase the recommended measures/technologies
_31 Implementing the recommendations will be straight forward/easy

----------*Screen Break*----------

Exceed expectations	Meet expectations	Not meet expectations	Too soon to tell
3	2	1	4

----------*Screen Break*----------

I already implemented this tip before visiting the Web site	I have implemented this tip	I plan to implement this tip in the next 6 months	I plan to implement this tip in the next 6 to 12 months	I do not plan to implement this tip
5	4	3	2	1

----------*Screen Break*----------

Q17b Please tell me on a 1 to 10 scale, how much the website influenced your decision to implement each tip, where 1 means “not at all influential”, and 10 is “very influential”.

1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**

[PIPE ALL Q17A ITEMS <> 1 OR 5]

----------*Screen Break*----------

Q18A What, if any, energy saving products with rebates did you buy?

[TEXT BOX; DO NOT FORCE]

Yes.....1
No 2

----------*Screen Break*----------

Q18B Did the product information and manufacturer links featured on the site influence you to purchase a product?

Yes.....1
No 2

----------*Screen Break*----------

Q18C What energy saving products did you buy?

[TEXT BOX; DO NOT FORCE]

----------*Screen Break*----------

Agree Strongly	**Agree Somewhat**	**Neither agree nor disagree**	**Disagree somewhat**	**Disagree strongly**
5	**4**	**3**	**2**	**1**

_1 Credible information about saving energy is easy to find
_2 I am well-informed about how to save energy in my home/business
_3 I am aware of information about energy efficient products offered by manufacturers
_4 All this conservation stuff is just common sense
_5 I’ve known all this conservation stuff for a long time
_6 PG&E is a useful source of energy efficiency information
_7 Media coverage of the energy crisis in the last year made me use energy more carefully

----------*Screen Break*----------

Not at All Knowledgeable									Very Knowledgeable

1	2	3	4	5	6	7	8	9	10

----------*Screen Break*----------

Not at All Knowledgeable									Very Knowledgeable
1	2	3	4	5	6	7	8	9	10

----------*Screen Break*----------

I have done this	I plan to do this in the next 6 months	I plan to do this in the next 6 to 12 months	I do not plan to do this
4	**3**	**2**	**1**

----------*Screen Break*----------

Yes.....1
No 2
Extremely likely.....5
Very likely.....4
Somewhat likely.....3
Not very likely.....2
Not at all likely.....1

----------*Screen Break*----------

----------*Screen Break*----------

Demographics

Now we would like to get a little information about you. Remember, all of your responses are completely confidential. Your answers will be combined with the answers of hundreds of other people's answers and reported only in aggregate.

D1 Which of the following statements best describes your level of expertise when it comes to using the Internet or the Web? Would you say…?

Please select only one.

I consider myself a beginner, just starting to figure out how to navigate the Internet or the Web.....1
I consider myself to be at the intermediate level and have a good working knowledge of how to navigate the Internet or Web.....2
I consider myself to be a "Web expert" when it comes to navigating the Internet or Web 3

----------*Screen Break*----------

D2 How frequently would you say that you do the following activities?

Please select one for each item.

[RANDOMIZE LIST]

	Daily 5	A few times a week 4	A few times a month 3	A few times a year 2	Never 1
_32 Purchase or pay bills online					
_33 Research information online					
_34 Do travel planning online					
_35 Do your banking online					
_36 Buy or sell stocks online					
_37 Send electronic postcards such as birthday cards					
_38 Email					

----------*Screen Break*----------

D3 Are you…

Please select only one.

Male 1
Female.....2
Prefer not to say 3

D4 Which of the following groups includes your age?

Please select only one.

Under 18 1
18 - 24 2
25 - 34 3
35 - 44 4
45 - 54 5
55 - 65 6
Over 65 7
Prefer not to say 8

D5 What is the highest level you completed in school?

Please select only one.

Elementary school 1
Some high school 2
Graduated high school 3
Trade or technical school 4
Some college 5
Graduated college 6
Graduate/professional school 7
Prefer not to say 8

[IF CELL 3 OR 4, SKIP TO D8, ELSE CONTINUE]

----------*Screen Break*----------

D7 Which of the following ranges includes your total annual household income before taxes?

Please select only one.

Less than $30,000 1
$30,000 – $49,999 2
$50,000 – $74,999 3
$75,000 - $99,999 4
$100,000 - $149,999 5
$150,000 or more 6
Prefer not to say 7

D7A Which of the following best describes your home?

Single family home 1
Apartment or condo in building with 4 or fewer units 2
Apartment or condo in building with more than 4 units 3
Townhome 4

Trailer/mobile home.....5
Other.....6

[SKIP TO CLOSE]

----------*Screen Break*----------

1 to 5 1
6 to 10 2
11 to 20 3
21 to 50 4
51 to 100 5
Or, over 100 6

Less than 2,500 square feet.....1
2,500 but less than 5,000 square feet 2
5,000 but less than 10,000 square feet 3
10,000 but less than 20,000 square feet 4
20,000 but less than 50,000 square feet 5
50,000 but less than 100,000 square feet 6
Ag/Non-facility – Outdoors.....7
Don't know.....8

Please select only one.

Office 1
Retail (non-food).....2
College/university.....3
School.....4
Grocery store 5
Convenience store.....6
Restaurant 7
Health care/hospital.....8
Hotel or motel 9
Warehouse 10
Personal Service.....11
Community Service/Church/Temple/Municipality 12
Industrial Process/Manufacturing/Assembly.....13
Condo Assoc/Apartment Mgmt.....14
Other, please specify [TEXT BOX].....15

----------*Screen Break*----------

CLOSING

[CLOSING SCREEN]

Thank you for your time and valuable insight. You will receive the gift certificate at the email address you provided in approximately 3 to 4 weeks. To redeem, simply follow the instructions on Amazon.com.

[BUTTON TO CLOSE WINDOW: "THANK YOU"]

----------*Screen Break*----------

APPENDIX B

JANUARY 7, 2003

PG&E ***TELEPHONE INTERVIEWS***

C. USER INTERFACE GUIDE 15-30 minute interview

Topic I: Introduction/Current Attitudes & Usage (2 minutes)

Hello, my name is Joe Thomas and I will be talking to you today about the California Energy Connection Web site. As we do so, I would like it if you could speak to me in the role of _____(title)_____ as relates to this Web site.

I would also like to tell you that I am recording this call. I do this so that when I write the analysis I can check my notes. Is this okay?

All right…

Role in the process

1. To begin with, what was your role at the start of creating California Energy Connection Web site?
    a. What were your responsibilities?
2. How would you describe your role today?
    a. How has it changed from when the project began?
    b. Why have these changes happened?

Overall experience with the site's development

3. When the project was initiated, what were the overall objectives for the project?
    a. What were your particular goals?
    b. Have these changed over time?
4. What were your expectations about working on the CEC team?
    a. How has your experience compared to those expectations?
5. Please tell me about the specific challenges you faced with the California Energy Connection Web site project.
6. For you, what parts of the project have gone well or smoothly?
    a. Why do you think this is so?

Opinions with how well the site is working

7. In your opinion, how well does this site work?
    a. What are its strengths?
    b. Its weaknesses?
8. How does the current product compare to your initial objectives and goals?
    a. What are any differences between what is currently up and what you had anticipated to be online?

Plans for the next iteration

9. What would like to see changed on the site?
    a. Why those changes?
10. What needs to happen for those changes to occur?
    a. What is your role in those changes?
11. Now that the site has been up and running, have the overall objectives for it changed?
    a. How so?

12. What are some new goals for the site so that it better meets the overall objectives?
13. Do you anticipate that your role in this project will change?
    a. Why/why not?

APPENDIX C

Exhibit C-1
California Energy Connection Residential Mailer -Front

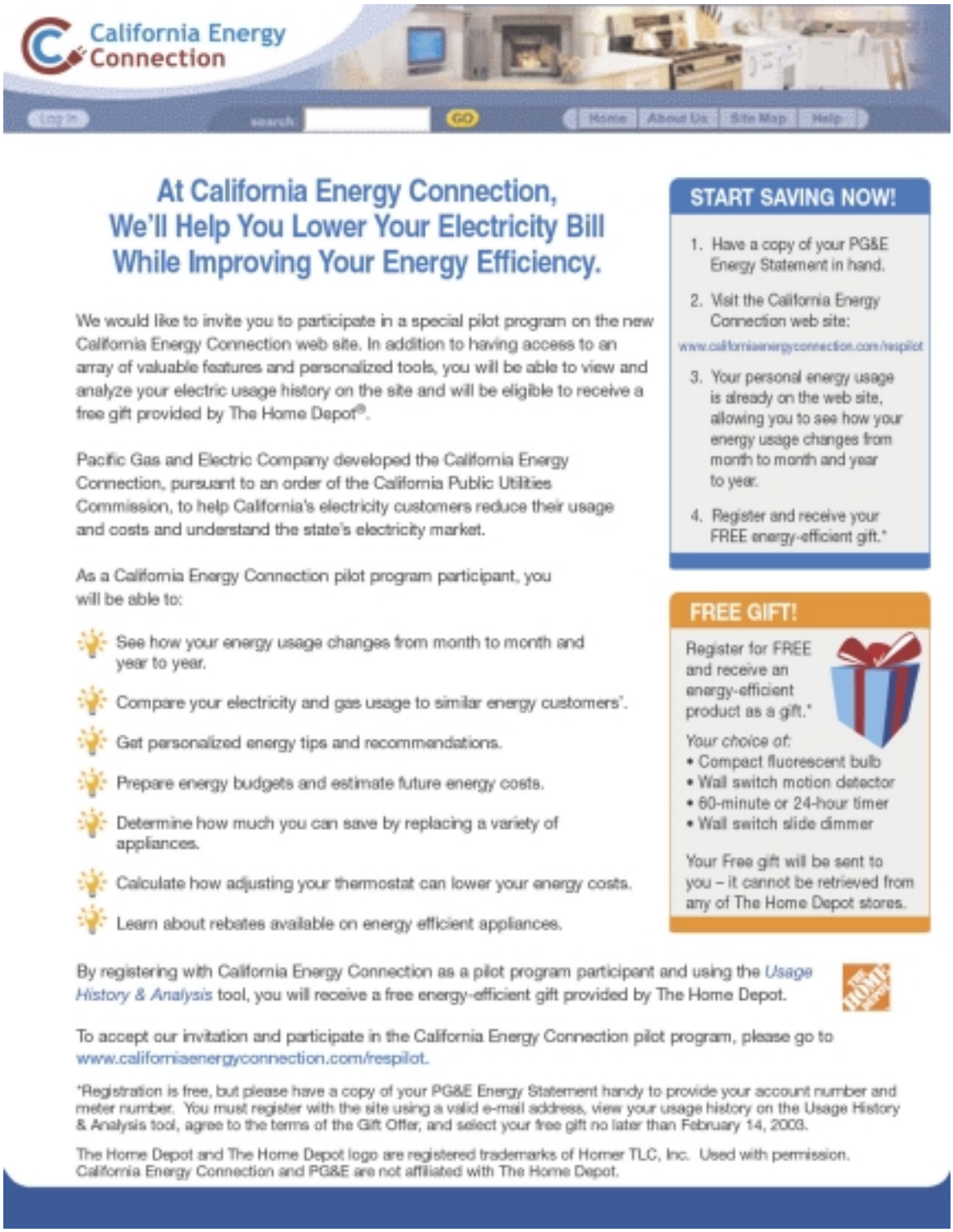

Exhibit C-1 (Continued)
California Energy Connection Residential Mailer – Back

California Energy Connection

California Energy Connection
Mail Code B29R
77 Beale Street
San Francisco, CA 94105-1814

Presorted
First-Class Mail
U.S. Postage
PAID
Phoenix, AZ
Permit No. 5343

Register for FREE and receive an energy-efficient product as our gift.
Details Inside

Exhibit C-2
Follow Up Mailer – Residential

California Energy Connection

California Energy Connection
Mail Code B29R
77 Beale Street
San Francisco, CA 94105-1814

Presorted
First-Class Mail
U.S. Postage
PAID
Phoenix, AZ
Permit No. 5343

Time's Running Out to Receive Your Free Gift.

We sent your invitation last November but haven't heard from you.

- You've been selected as a pilot customer on a **new Web site** developed by **Pacific Gas and Electric Company!**
- We'll send you a **$15** energy efficient product of your choice* provided by The Home Depot® as our gift for participating.

California Energy Connection

Just follow these quick and easy steps

1. Have a copy of your PG&E Energy Statement in hand.
2. Visit the California Energy Connection web site: **www.californiaenergyconnection.com/respilot**
3. Your energy usage can be accessed by you on the web site, allowing you to analyze your energy usage and save money.
4. Register and receive a FREE energy-efficient gift*.

* You must register with the site using a valid e-mail address, view your usage history on the Usage History and Analysis tool, agree to the terms of the Gift Offer, and select your free gift no later than February 14, 2003 to be eligible. Registration is free, but please have a copy of your PG&E Energy Statement handy to provide your account and meter numbers.

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Exhibit C-3
Follow Up Mailer - Business

California Energy Connection

California Energy Connection
Mail Code B29R
77 Beale Street
San Francisco, CA 94105-1814

Presorted
First-Class Mail
U.S. Postage
PAID
Phoenix, AZ
Permit No. 5343

Time's Running Out to Receive Your Free Gift.

We sent your invitation last November but haven't heard from you.

- You've been selected as a pilot customer on a **new Web site** developed by **Pacific Gas and Electric Company!**
- We'll send you a **$15** energy efficient product of your choice* provided by The Home Depot® as our gift for participating.

California Energy Connection

Just follow these quick and easy steps

1. Have a copy of your PG&E Energy Statement in hand.
2. Visit the California Energy Connection web site: **www.californiaenergyconnection.com/buspilot**
3. Your energy usage can be accessed by you on the web site, allowing you to analyze your energy usage and save money.
4. Register and receive a FREE energy-efficient gift*.

* You must register with the site using a valid e-mail address, view your usage history on the Usage History and Analysis tool, agree to the terms of the Gift Offer, and select your free gift no later than February 14, 2003 to be eligible. Registration is free, but please have a copy of your PG&E Energy Statement handy to provide your account and meter numbers.

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Exhibit C-4
California Energy Connection Business Mailer –Inside

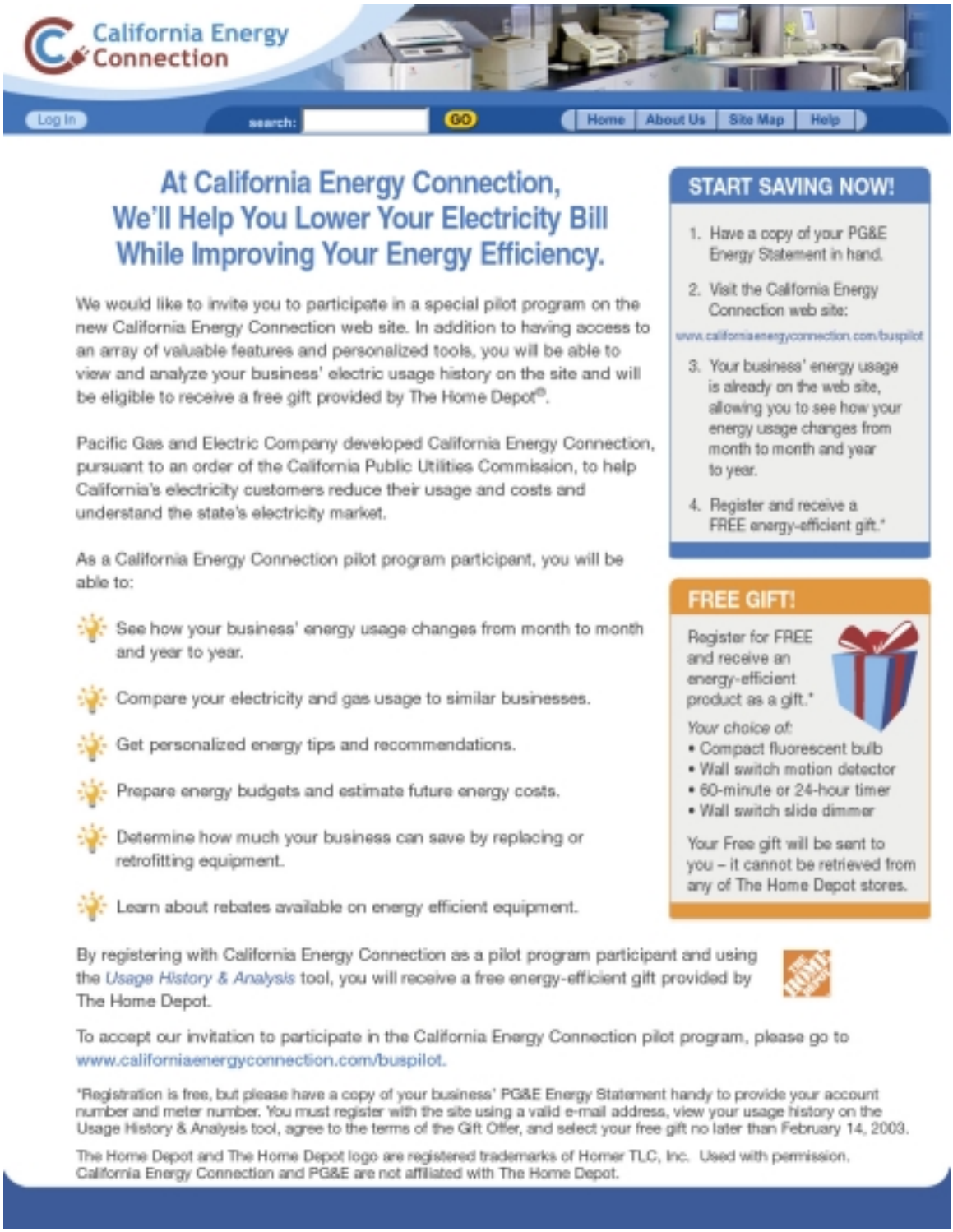

Exhibit C-4 (Continued)
California Energy Connection Business Mailer –Outside