INTERACTIVE CONSUMPTION AND COST INFORMATION FOR SMALL CUSTOMERS – PROGRAM PROCESS/CUSTOMER RESPONSE EVALUATION – PROGRAM YEAR 2003

FINAL

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EXECUTIVE SUMMARY

In 2001, the California Public Utilities Commission (CPUC) authorized a pilot program "to provide interactive consumption and cost information to small customers, such as historical energy bill information, representative energy usage and cost information for common appliances, and tariff options."[1] This report presents the second 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 this Web site. As part of this effort, PG&E contracted with a software company to design this informational Web site. The CPUC also authorized evaluation of the Web site "during and after the program period." PG&E contracted the services of the Quantum Consulting/Socratic Technologies team to "conduct a Study to assist PG&E and the CPUC to assess the effectiveness of the Interactive Consumption and Cost Information Web Site with residential and small business customers."[2]

This Year 2 evaluation moves beyond a narrow technical evaluation of Web site usability to consider the critical questions of California Energy Connection's usefulness and effectiveness in helping customers save energy. Year 1 recommendations addressed the question: "What can be improved about the Web site?" Year 2 research is geared toward the question: "How useful and effective is the final product?"

This evaluation employed multiple qualitative and quantitative methodologies to assess PG&E's California Energy Connection Web site:

- **Usability testing** that provided user feedback on ease of navigation, design, information layout, and site content.
- **Analysis of Web server statistics**, including usage, average length of visit, specific pages visited, and length of visit per page.
- **Click path analysis** of key areas of site real estate.
- **Competitor Web site benchmarking** of site content, features and analysis tools.
- **Quantitative user/non-user Web survey** that examined customer awareness, intentions to visit, usefulness of the site, usability and satisfaction.

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[1] Decision 01-03-037 in Rulemaking 98-07-037 (March 27, 2001), p. 3.

[2] PG&E, *Request for Proposal* No. F-003-02-LJY For Multi-Year Measurement and Evaluation of the Interactive Consumption and Cost Information Program as Required by the California Public Utilities Commission Decision 01-03-073 (September 2, 2002), p. 17.

- **Impact analysis** that analyzed the effects of the Web site on customer behavior, estimated the site's energy savings and its ability to influence customers to adopt energy savings measures.

A summary of findings is presented below, presenting the results of four key objectives of this evaluation (1) the Web site's usefulness, (2) the effectiveness of California Energy connection in terms of changing energy usage and energy efficiency behaviors, (3) an assessment of improvements to the Web site and (4) lessons from the benchmarking assessment.

ES.1 USEFULNESS OF CALIFORNIA ENERGY CONNECTION WEB SITE

Web site traffic increased in 2003, largely driven by the Amazon.com gift certificate.

- More users visited the Web site in 2003 than in 2002. The number of unique visitors in November 2003 was nearly triple the amount in November 2003. Likewise, more users moved through the pilot registration path in 2003 than 2002. However, traffic dropped off sharply in December 2003, suggesting the visitation was largely driven by PG&E mailers sent to 17,238 residential and small businesses customers on October 27, 2003, with a limited time Amazon.com incentive to visit the Web site.

- Getting a Amazon.com gift certificate was the primary reason customers visited the site (59%).

- The most visited content areas of the California Energy Connection Web site were the energy savings tips and rebate opportunities (user survey)

- However, most areas of the Web site were visited less frequently, on a per user basis (e.g. tips were used by 94% of users in 2002 and only 75% in 2003), but number of hits on the various areas remained about the same.

Usability continues to be very good.

- The purpose and function of the site are immediately clear upon visiting the homepage and splash page.

- 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.

- Icons help users differentiate information and links, and also provide an attractive interface.

- Navigation throughout the site is consistent and provides a stable structure in which users can easily find information/content.

- Navigation elements (links and buttons) are consistent and easily recognizable.

- High-level organization of information and corresponding section nomenclature are intuitive; Residential and Business content is clearly distinguished.

- Content is comprehensive, including specific information about products and the electricity market in California.

Users consider the Web site to be credible and view PG&E as a trusted information source.

- Two-thirds of residential users were aware that PG&E sponsored the site in 2003, compared with 41% in 2002 although no changes in site branding were made. More business users associated California Energy Connection Web site with the CPUC in 2003, 37% versus 31%.

- Respondents generally perceived the Web site and PG&E as credible.
  - Most assumed that the California Energy Connection Web site was a good-faith effort at helping customers reduce energy costs.
  - Respondents in 2003 had a more positive perception of PG&E and were more inclined PG&E as a trusted source than in 2002.
  - Respondents tended to expect PG&E to want to provide unbiased information on how to lower energy use, even though it is apparently "against their interests."

- A few respondents wondered why "this site isn't part of PG&E."

Users made shorter visits in 2003 and did not interact with the Web site much.

- Both web statistics and user survey suggest that usage declined across the board.
  - Users spent far less time at the Web site in 2003. The average length of a visit in December 2003 fell to five minutes, compared with 11 minutes the previous December.
  - In 2003, the longest path typically involved three things: splash page entry, registration and site entry. By contrast, 2002 users tended to enter, register, and visit the Analysis Tools.

Usage has declined across the site, particularly use of the analysis tools.

- User survey results suggest that use declined for each of the trackable Web site areas. Visitors continued to seek energy savings tips (73% versus 94% in 2002), but visits to the audit tool, energy calculators and product information dropped dramatically in 2003. This was one of the few statistically significant differences between Wave 1 and Wave 2 in the quantitative user/nonuser survey.

- Web server statistics also indicate that visits to Analysis Tools dropped off in Year 2, as did Energy Saving Tips. These path statistics are consistent with customer survey results; far less customers reported that they visited the site in order to use the audit tool

- The least visited areas are energy market news and the Bill Analyzer, according to the user survey.

- Web statistics indicate that Energy-saving Products and Rebate Opportunities information areas gained some popularity in 2003. Rebate opportunities continued to capture customers' interest in 2003, according to users who offered reasons for their visit.

Users were uncertain about the value of the analysis tools.

- Generally, respondents who finished the Business Energy analyzer stated that there were *"too many questions, I don't have time for this."* Only one respondent found value in completing all the analyzer questions.

- Non-pilot users who visited Usage History stated that they would not take the time to manually enter all their billing information. Although pilot users have billing history available, non-pilot users do not. One or two mentioned that they keep their records separate from their computer, and it would be "too much work" to retrieve the bills and enter in the information. Non-pilot users also were not sure that the effort of inputting the data would be worth the benefit of seeing a chart.

- Many users were unable to clearly differentiate between FastTrack and Home Energy Analysis.
  - Users were unsure which particular tool to use (Energy Analysis, Fast Track, Bill Analyzer, and Usage History). Respondents were sometimes unclear of the differences between FastTrack, Energy Analysis (home and business), and My Benchmark.

Customers need to be convinced that the tools are worth their time.

- Add a "What you get" feature that show potential results may motivate users to use the audits.
  - For Business Energy Analysis users, add a "what's this?" link below each of the questions in the form part of the tools that links to the pop-up help window. This extra call-out may aid users in understanding how to get definitions of the questions or terms in the form.
  - Inform users of the types of suggestions given by the Bill Analyzer. While users found value in the results, most were not sure what to expect while entering data.

Customer Expectations need to be better managed.

- Users needed to know in advance what information they would need to complete the analysis tools.
  - Inform users upfront that in order to complete the analysis they will need to have past bills handy.

- Present users with more information about the results of the Analyzers *before* they are asked questions. This will address users concerns about the Business Energy Analysis, such as: "I don't know exactly how the results will look, I'm not sure I'd have time to do this."

- Consider functionality for all users that grabs user-billing data from the PG&E database so the user does not have to keep track (currently, billing data is automatically loaded for pilot users only).
  - Highlight areas where user-billing info is automatically imported and how using this feature helps save users time in completing the online energy audit.

Customers visited the Web site twice on average, and claim they intend to return.

- According to the user survey, Customers visited California Energy Connection CEC.com two times on average
  - One-third indicated that they visited the Web site only once.
- Most users intend to return.
  - Users intend to explore energy saving tips in a return visit. Users also mentioned using other tools (calculator, bill analyzer, audit) in a return visit. However, many did not notice these tools in their initial visit, suggesting that they were introduced to the tools in completing the user/non-user survey, not during their Web site visit.
  - Business users noted that they might be less likely to return to the site, citing time concerns, as reported in usability testing (Chapter 3)

User satisfaction remained high, but overall impressions are unenthusiastic.

- User satisfaction is relatively high, unchanged from last year. Satisfaction may be related to ease of use; users again found California Energy Connection easy to use.
- Users were less favorably disposed toward California Energy Connection Web site in 2003, although few held a "very unfavorable opinion" of the Web site.
  - Residential users who were "somewhat" favorably inclined toward the Web site fell from 63% to 49%, while the number of residential customers who were neither favorably nor unfavorably impressed tripled to nearly 30%.
- These lukewarm overall impressions are reinforced by users' opinions of the usefulness of Web site activities. In particular, one-time visitors rated the usefulness of site activities much lower than last year.

Recent changes to the Web Site did not improve the site's usefulness.

- Changes to site layout and interface, made in response to Year 1 recommendations, increased the usability of California Energy Connection.
- However, two new areas of the Web site – "My Home Page" and the Bill Analyzer – were not attractive to users.
  - Of the users that noticed these areas, more chose *not* to visit them.

- Both the quantitative survey and usability research indicated that users found these two features to be the hardest to use and were less satisfied with them than any other element of the Web site.
- Users did not consider the "My Home Page" feature helpful, according to the quantitative survey.

ES.2 EFFECTIVENESS OF CALIFORNIA ENERGY WEB SITE

As was reported in the Program Year 2002 evaluation, there exists 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. The primary component of the Web site likely to generate savings and affect customer behavior is the audit, but several factors limit its effectiveness.

Several factors limit the audit's potential to deliver energy savings.

- Relatively low number of customers completed at least enough of the audit to get energy saving recommendations. Of the residential users that registered with the site, only 10% received audit recommendations.
- Although the audit was successful in influencing customers to adopt recommendations, web survey results indicated that some users felt the results were too general and not customized enough.
- Customers reported having already adopted over half of the recommended measures prior to visiting the Web site.
- None of the surveyed customers that received audit recommendations used the rebate finder to obtain an incentive on a purchased product, indicating a lack of linkage between these areas of the Web site.

Increase customer adoption of audit recommendations by:

- Reducing number of recommendations
- 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.

Most registered users viewed the energy savings tips, but many users had already adopted more than half of the tips before visiting the Web site.

- The Web site is capable of generating significant energy savings and impacting customer behavior through the energy saving tips.

- Three-quarters of the registered users that participated in the quantitative survey reported having viewed these tips (down from 94% in 2002). 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.

- As with the audit recommendations, surveyed users report having already adopted more than half of the savings tips prior to visiting the Web site. Potential savings associated with the tips could be improved by reviewing and revising the list of measures presented.

- 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.

About 10% of users surveyed said they purchased energy efficient equipment as a result of visiting either the rebate finder, manufacturer links, or product information.

- As with the 2002 evaluation, the site provided information that led to customer adoptions through the rebate finder, product information and manufacturer links.

- However, rebate and product information is helpful to customers who are in the market to purchase energy efficient equipment. Consequently, many users gave their lowest rating to the Web's usefulness in encouraging them to purchase energy efficient products. Both residential and business users believed the Web site to be less "helpful in getting me to make decisions regarding purchasing energy-efficiency equipment," according to the user survey.

The Web site was successful in increasing customer knowledge about energy efficiency and conservation.

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

- Findings from the quantitative survey indicated that customers generally found the site useful (in particular the energy tips and recommendations).

ES.3 LESSONS FROM THE BENCHMARKING ASSESSMENT

The California Energy Connection Web site compared very favorably to its peers.

- The California Energy Connection Web Site has fulfilled its mandate, "to provide residential and small business electricity customers with information and tools to help them analyze and evaluate their electricity usage and issues, effectively reduce their electricity consumption and costs, learn about techniques and products to improve their energy efficiency, understand recent and ongoing changes in the California electricity market, and get up-to-the-minute news on a range of electricity-related topics."

Results of the benchmarking assessment of competitor sites suggests that the California Energy Connection Web Site could be strengthened by:

- Linking to utility customer information (like PGE.com) to enable customer account management.

- Adding a retail store (or contractor) finder that links consumers directly to stores.

- Adding a printable checklist that customers can use to gather the information needed from their home or business (i.e. utility bill, thermostat setpoint) in order to complete the survey.
  - Customers would benefit from this feature because the Nexus California Energy Connection tool require numerous inputs in order to generate detailed outputs.
    .. A printable checklist would serve as a quality control feature and could potentially reduce attrition, as some customers do not complete the survey due to the unexpected data and time demands of the audit tool.
  - Informing customers about the time needed to complete the survey and status of the progress towards completion while performing the audit.
  - Linking audit recommendations directly to energy efficiency rebate programs.
  - Creating a summary list that sorts recommendations by cost-effectiveness and/or highlights key cost-effective measures.

PGE.com and the California Energy Connection Web site are not significantly different.

- Both PG&E.com and California Energy Connection offer the same set of content and features that users found to be the most useful – energy calculators, energy saving tips, product information, rebate information, and usage history.

- Both sites also offer the same Nexus audit products.

California Energy Connection could eliminate duplicative content and analysis tools and instead provide links to the four California IOU Web sites.

- The IOU web sites have the advantage of having access to customer billing data, eliminating the need for customers to enter in this information.

- The IOUs are considered to be a trusted brand and credible information source, helping to increase the likelihood of customers adopting energy efficient measures and practices.
  - A few respondents wondered why "this site isn't part of PG&E."
  - Eleven percent of users found the site through PGE.com.

- Similarly, the IOU Web sites could provide links to unique areas of the California Energy Connection Web site, such as the market information. Or this information could

be migrated over to the IOU Web sites, eliminating the need for the California Energy Connection Web site.

Going forward, the CPUC must decide if this pilot Web site is valuable enough to continue as a standalone program, even though (1) 6% of customers who received a PG&E mailer became a registered Web site user, (2) many customers who visit the Web site find out about it through PGE.com, (3) California Energy Connection contains the same Nexus audit tools and similar energy efficiency content as the IOU Web sites and (3) user surveys indicate that customers find PG&E a credible source of information and identify PG&E with the site. These findings suggest that this information could be effectively presented at the IOU level.

1. INTRODUCTION

In 2001, the California Public Utilities Commission (CPUC) authorized a pilot program "to provide interactive consumption and cost information to small customers, such as historical energy bill information, representative energy usage and cost information for common appliances, and tariff options."[1] This report presents the second 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 this Web site. As part of this effort, PG&E contracted a software company to design this informational Web site. The CPUC also authorized evaluation of the Web site "during and after the program period." PG&E contracted the services of the Quantum Consulting/Socratic Technologies team to "conduct a Study to assist PG&E and the CPUC to assess the effectiveness of the Interactive Consumption and Cost Information Web Site with residential and small business customers."[2]

Year 1 (2002) Evaluation

The Year 1 Evaluation offered a thorough technical evaluation of the Web site (which aspects of the site's features, services, content and layout work well, which need improvement), offered recommendations for Web site enhancements, estimated the site's effect on customer behavior (such as intentions to adopt energy saving measures, and knowledge and attitudes about energy efficiency), and estimated the site's energy savings potential.[3] This independent assessment of the Year 1 pilot program found that PG&E fulfilled the CPUC directive, providing information to help consumers analyze their usage, reduce their usage and costs, learn about energy-saving products, and electricity market information.

Year 2 (2003) Evaluation

To assess the effectiveness of the pilot Web site in Year 2, this evaluation asks two basic questions:

- Is the California Energy Connection Web site useful to targeted customers?
- Does it help customers reduce their energy usage?

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[1] Decision 01-03-037 in Rulemaking 98-07-037 (March 27, 2001), p. 3.

[2] PG&E, *Request for Proposal* No. F-003-02-LJY For Multi-Year Measurement and Evaluation of the Interactive Consumption and Cost Information Program as Required by the California Public Utilities Commission Decision 01-03-073 (September 2, 2002), p. 17.

[3] Quantum Consulting and Socratic Technologies, *Interactive Consumption and Cost Information for Small Customers – Program Process/Customer Response Evaluation – Program Year 2002* (February 27, 2003).

In 2003, program efforts were geared around enhancing the Web site, such as the Bill Analyzer, which helps customers understand they their bill and usage change over time, and My Homepage, which offers allows users to customize content, layout, create to do lists and personalized product lists. As part of our assessment of the Web site's usefulness, we examined users' opinions of these changes. We conducted a second wave of user/non-user survey and usability testing to make these year-over-year comparisons. Thus, most Year 1 research activities were repeated in this evaluation as part of this longitudinal analysis.

1.1 CPUC'S INFORMATIONAL OBJECTIVES FOR THE WEBSITE

The CPUC decision surrounding this program requires that PG&E create a Web site. By any measure, PG&E has met the CPUC's objective in that it created a Web site that provides "interactive consumption and cost information to small customers."[4] The mission of the California Energy Connection, as stated on the Web site, reflects the CPUC directive: "to provide residential and small business electricity customers with information and tools to help them analyze and evaluate their electricity usage and issues, effectively reduce their electricity consumption and costs, learn about techniques and products to improve their energy efficiency, understand recent and ongoing changes in the California electricity market, and get up-to-the-minute news on a range of electricity-related topics." We have translated the mission into eight informational objectives, listed in Exhibit 1-1. The Web site has consistently met those objectives, based on the independent assessment presented in this report as well as the Year 1 Evaluation.

Exhibit 1-1
CPUC'S Informational Objectives for California Energy Connection Web Site

INFORMATIONAL OBJECTIVES OF PROGRAM	OBJECTIVE MET	WEBSITE AREAS				
		Analyze Your Usage	Reduce Usage and Costs	Energy-Saving Products	Electricity Market Info	Current Information
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	●		●	●		

[4] Decision 01-03-037 in Rulemaking 98-07-037 (March 27, 2001), p. 3.

This independent assessment finds that the Web Program has 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. The Bill Analyzer, a new interactive tool added to the Web site in 2003, helps customers understand changes in their energy bills over time. Historic billing information was loaded for pilot audit users. 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 information on no-cost techniques, high-efficiency products, rebates and 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 solutions to reducing customer 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.

Marketing Objectives

Additional CPUC objectives were to:

- **Provide historic billing information.** This was loaded and available for the 17,238 pilot users.

- **Reach 10,000 to 15,000 pilot customers**. PG&E sent mailers to 17,238 residential and small businesses customers offering them an incentive to visit the Web site, but there were only 954 pilot users as January 2004.[5] That is, 6% 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

[5] The residential and business mailers can be found in Appendix E.

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 4,546 small commercial customers and 12,692 residential customers (bill inserts bill inserts cannot be selectively sent to a subgroup of customers).

1.2 YEAR 2 EVALUATION OBJECTIVES

The Year 2 evaluation moves beyond a narrow technical evaluation of website usability to consider the critical questions of California Energy Connection's usefulness and effectiveness in helping customers save energy. Year 1 recommendations addressed the question: "What can be improved about the Web site?" Year 2 research is geared toward the question: "How useful and effective is the final product?"

Exhibit 1-2 summarizes study objectives, indicates whether the study has met these research objectives, and points to the report chapters where they are addressed.

Exhibit 1-2
Evaluation Objectives

STUDY OBJECTIVES	Heuristic Review/ WebTrends Analysis	Usability Research	Survey Research	Impact Evalutaion	Conclusions
Primary Objectives					
Assess usefulness of Web site					
assess user satisfaction	●	●	●		●
analysis of Web site user data	●		●		●
what kinds of information do users look at	●	●			●
number of visitors	●				●
return visits	●				●
click patterns	●				●
click-through rates to manufacturer websites	●				●
Assess effectiveness of Web site with targeted customers					
assess changes in behaviors regarding energy usage			●	●	●
Secondary Objectives					
Assess improvements to Web site		●	●		●
Recommendations for Web site enhancements	●	●			●
Benchmark web site against other, similar sites	●				●

● Objective Fully Met

The evaluation's two primary objectives – assessing the effectiveness and usefulness of California Energy Connection – are closely related. This evaluation fully addresses each objective laid out in Exhibit 1-2.

Primary Objectives

- **Assess effectiveness of California Energy Connection.** The usefulness of California Energy Connection is mainly assessed through the behavior of Web site users. Were users influenced to reduce their usage due to their Web site interactions? Did users who completed the energy audit adopt any recommendations? Did their knowledge of energy efficient products or attitudes towards energy efficiency change?

- **Assess usefulness of California Energy Connection.** This evaluation offers numerous measures of effectiveness, such as number of users, repeat visitors, time spent on the site, and user satisfaction. We combine Web server log data (WebTrends), survey data and user interviews to comprehensively examine what information users find valuable. The WebTrends analysis, includes data on average length of visit, specific pages visited, and length of visit per page. In addition, we contacted 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.

We also make year-over-year comparisons, primarily drawn through longitudinal survey analysis and Web server log data, to assess the usefulness of the Web site over time.

Secondary Objectives

- **Assess improvements to the Web site**. We assess the effectiveness of three specific changes to the Web site: the addition of the Bill Analyzer , My Home Page and the advanced search features.

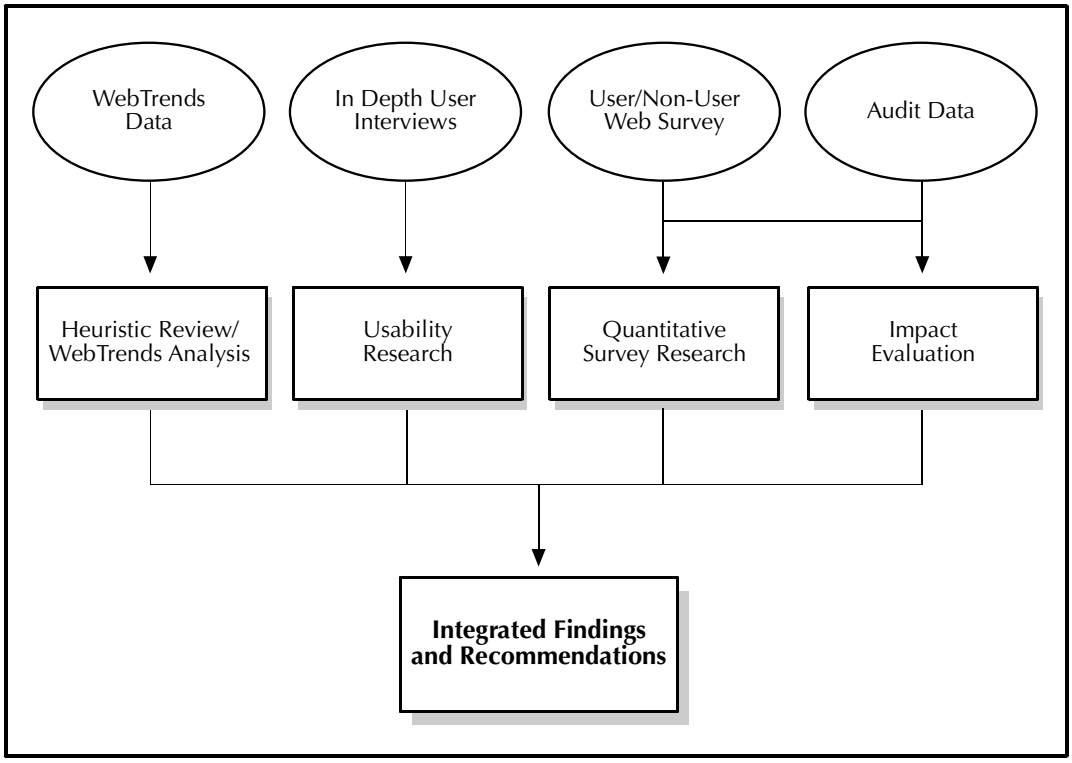
- **Recommendations for Web site enhancements.** Like the Year 1 evaluation, we draw on feedback from users to recommend ways to improve the Web site.

- **Benchmark Web site against others, similar sites**: This purpose of this benchmarking effort is to determine how comprehensive California Energy Connection is relative to other energy efficiency web sites and whether there is a need for new or improved information on the site that will help California's consumers improve energy efficiency.

1.3 YEAR 2 EVALUATION APPROACH

Our approach to fulfilling these Study objectives, summarized in Exhibit 1-3, is based on analyses that utilize four data sources: user interviews, WebTrends, audit data and quantitative Web survey.

Exhibit 1-3
Overview of the Approach



1.4 REPORT OUTLINE

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 detail in each chapter.

Heuristic Evaluation and WebTrends Analysis (Chapter 2), reports server log data, offers a click path analysis and web site benchmarking effort. Server log data was analyzed to provide insight into key areas of site real estate, offering validation for usability findings. This WebTrends analysis includes data on average length of visit, specific pages visited, and length of visit per page. The click stream analysis specifically provides insight into where users are currently going on the site and where they are dropping off. The benchmarking analysis focuses on site content and features and the audit tool, systematically benchmarking California Energy Connection and five other energy efficiency web sites in terms of checklist of information and features, and evaluating to systematically benchmark five web sites in terms of content and four online audit tools with respect to their features and recommendations.

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 2003. 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.

Survey Results (Chapter 4). A quantitative Web survey was conducted with 301 non-users and 177 users in December 2003. Survey responses address awareness, intentions to visit, usefulness of the site, usability and satisfaction.

Impact Evaluation (Chapter 5). 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 6). The final chapter summarizes research findings and offers an integrated set of recommendations focused on the future of California Energy Connection. These findings and recommendations – the result of different research methodologies working in concert – provide a robust view of the pilot program.

Appendices. Appendix A contains the user/non-user survey instrument. Appendices B and C provide extensive reviews of online audit products to supplement the benchmarking assessment. Appendix B is a 2001 California Energy Commission report, *Home Energy Analysis Software Study*. Appendix C is LBNL's *Review and Comparison of Web-and Disk-based Tools for Residential Energy Analysis*. Appendix D is presents longitudinal data tables comparing user opinions of the California Energy Connection Web site usage in Year 1 and Year 2. User ratings are based on a 5 point scale, where 5 means extremely positive. Discussion of these year-over-year results can be found in Chapter 4. Appendix E contains California Energy Connection mailers distributed by PG&E.

2. HEURISTIC REVIEW AND WEB TRENDS ANALYSIS

2.1 BACKGROUND AND METHODOLOGY

This chapter contains the heuristic evaluation of the California Energy Connection, an analysis of WebTrends server log data and a benchmarking assessment of content, usability and audit tools offered by similar Web sites. This evaluation allows management at PG&E to determine which aspects of the site's features, services, content, and layout need improvement. Additionally, the analysis will address how these areas compare to standard Web "best practices."

This report reflects the second wave (wave 2) of testing. Based on results of the first wave (wave 1, in February 2002), modifications were made to the Web Site to improve its navigation, content, and user-friendliness. The current Web Site will be evaluated against the same standards used in the first wave.

The heuristic evaluation was conducted by Socratic Technologies' usability specialists who have years of experience conducting User Interface (UI) tests for a variety of software and Web offerings, and understand usability issues as well as other possible hindrances to the user experience. 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 CEC 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;
- Compare the content of the CEC site to other Web sites that are similar in content, in order to identify a set of best practices and features.

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 1679 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 California Energy Connection 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 WEB TRENDS

2.2.1 Web Trends Data – California Energy Connection

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

General Statistics for Wave 1 and Wave 2

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. Thus, Web bots increase hits to the web site without there being a real user. 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. California Energy Connection Web site). 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 visitors in December 2002 and 16 of the visitors in November 2003 were part of a usability study that used this Web site as its subject.

Exhibit 2-1
Web Site Usage Statistics
Year 1 versus Year 2

	Year 1		Year 2	
Statistic	**December 1-31, 2002**	**January 1-25, 2003**	**November 1-30, 2003**	**December 1-31, 2003**
Successful Hits For Entire Site	**66,916**	**94,212**	**370,802**	**115,393**
Average Hits Per Day	2,158	3,768	12,360	3,722
Home Page Hits	399	492	1,085	360
Page Views (Impressions)	**7,809**	**12,695**	**30,642**	**9,697**
Average Per Day	251	507	1,021	312
Dynamic Pages and Forms Views	4,357	7,138	15,501	5,516
Document Views	3,452	5,557	15,141	4,181
Visits	**1,570**	**3,571**	**8,362**	**3,767**
Average Per Day	50	142	278	121
Average Visit Length	00:11:07	00:09:06	00:07:53	00:05:17
International Visits	3.44%	0.67%	2.06%	3.77%
Visits of Unknown Origin	5.41%	2.91%	10.03%	8.79%
Visits From Your Country: United States (US)	91.15%	96.42%	87.91%	87.44%
Unique Visitors	**676**	**1,054**	**2,771**	**1,379**
Visitors Who Visited Once	423	609	2,036	965
Visitors Who Visited More Than Once	253	445	735	414

"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 California Energy Connection Web site, 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, About Us, and Site Map). 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 California Energy Connection Web site 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.

2.2.2 Pilot User Statistics through January 19, 2003

Exhibit 2-2 shows pilot (individuals who were sent California Energy Connection promotional materials) and non-pilot user (those that found the Web site on their own) statistics from the site's launch through January 19, 2004. For the purposes of this table, Wave 1 is defined as being from July 2002 through January 2003, and Wave 2 is February 2003 through December 2003. Customers who registered refers to customers who undertook the site's registration process. Customers who activated their registration refers to users that clicked on a confirmation e-mail with a link to the site to validate their registration. Users cannot log into portions of the site until they validate their registration.

Nearly all pilot and non-pilot users have activated their registration (pilot: 98%, non-pilot: 98%). Once users register, they are likely to activate their accounts.

Exhibit 2-2
Customer Statistics Summary

	Wave 1	Wave 2	Total
Number of pilot customers that registered	229	728	957
Number of pilot customers that activated their registration	213	728	941
Number of pilot customers that registered and availed their gifts	148	696	148
Number of non-pilot customers that registered	379	324	703
Number of non-pilot customers that activated their registration	366	324	690
Total number of customers who have registered	608	1,052	1,660

Note: All users who registered during November – December 2003 (approximately) were automatically sent gift certificates. Additional efforts were made to ensure that each registered user received their gift certificate e-mail message, including follow-up phone calls and emails for bounce-backs.

Exhibit 2-3 compares the total number of users who registered to the total number of unique visitors in Wave 1 and 2. More unique visitors registered with the Web site in Wave 2.

Exhibit 2-3
Number of Users That Registered

	Wave 1		Wave 2	
	December 2002	January 2003	November 2003	December 2003
Pilot	35	148	613	83
Non-Pilot	46	84	89	25
Total	81	232	702	108

2.2.3 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.

- While the overall numbers of visits increased in Wave 2, the percentage of visits to these particular areas remained low (less than 3% for each category). In both waves, the area with the most exits was Energy-Saving Products.

- While the Analysis Tools were the most popular type of information accessed in Wave 1, in Wave 2 the most popular type was Energy-Saving Products. Removing the "Step 1" from the Analyze Your Usage box may have reduced the influence on users to begin in that area. Energy-Saving Products was also the most exited area, although it is unknown if users had closed their browser, pressed the "Home" button, typed in a new URL, clicked a link to PGE.com, or visited a manufacturer's site.

- The Analysis Tools become the second-most visited area, in Wave 2, with 1.47% of total site visitors going there. This compares to 2.51% of users in Wave 1, and illustrates the largest change in numbers of visitors from Wave 1 to Wave 2.

- Visits to Rebate Opportunities did increase from Wave 1 to Wave 2 (0.84% to 1.03%). This may have been due to the addition of the Rebate Finder to the Products area (which was the most popular area of the site in Wave 2).

- Renewable Energy Sources continued to stay last in terms of popularity. In both waves it was not found in the top 50 most popular pages.

- In Wave 2 clicks from the californiaeenrgyconnection.com site to external sites were gathered. The most popular click off of the CEC site was to PGE.com. In terms of manufacturer sites, Anderson Windows was the most visited, followed by GE Lighting, Lights of America, Enertron, Milgard, Cardinal, and Philips Lighting The prevalence of these sites suggests that users were most interested in lighting and window products.

Exhibit 2-4
Table of Key Information Area Visits

Type of Information Users Viewed	Percent of Visits that Accessed this Information/Page Wave 1			Percent of Visits that Accessed this Information/Page Wave 2		
	December (Total=3,514)	January (Total=6,748)	Average	November (Total=18,088)	December (Total=5,860)	Average
Analysis Tools	2.68%	2.43%	2.51%	1.30%	1.98%	1.47%
Tips on Energy Savings	0.57%	0.71%	0.66%	0.33%	0.72%	0.43%
Rebate Opportunities	0.88%	0.82%	0.84%	0.84%	1.62%	1.03%
Information on Renewable Energy Sources	<0.40%[1]	<0.37%[1]	NA	<0.29%[4]	<0.38%[4]	NA
Energy-Saving Products	1.59%[2]	1.19%[2]	1.33%	1.53%[5]	3.55%[5]	2.02%
Market Information	1.40%[3]	0.84%[3]	1.03%	0.87%[6]	2.05%	1.16%

Wave 1 Notes:

[1] WebTrends lists the top 50 Pages by Visits and "renew energy" 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 Renewable Energy Resources had a visitation rate less than 0.40% in December and 0.37% in January.

[2] The "products/detail" 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 "elect_mkt_info" (0.63%) and "headline" (0.77%) were on the list of top 50 Pages by Views. It can be inferred that "rtinfo" was visited by less than 0.40% of visitors. The same pages were found in the top 50 Pages by Views list in January at the rates of 0.41% (elect_mkt_info) and 0.43% (headline), allowing the inference that "rtinfo" in January was visited by less than .037% of visitors.

Wave 2 Notes:

[4] As with Wave 1, "renew energy" was not on the November or December lists. The least visited page in November had been visited by 0.29% of visitors and in December by 0.38% of visitors. It can be inferred that Information on Renewable Energy Resources had a visitation rate less than 0.29% in December and 0.38% in January.

[5] The "products/detail" URL points to one of the ten product-specific pages, but does not indicate which particular product was visited.

[6] In November, only the pages "elect_mkt_info" (0.42%) and "headline" (0.45%) were on the list of top 50 Pages by Views. It can be inferred that "rtinfo" was visited by less than 0.29% of visitors.

Exhibit 2-5
Table of Key Information Area Exits

Type of Information Users Viewed	Percent of Visits that Exited on this Page Wave 1			Percent of Visits that Exited on this Page Wave 2		
	December (Total=830)	January (Total=1,733)	Average	November (Total=4,339)	December (Total=1,605)	Average
Analysis Tools	*1.45%[1]*	*1.38%[1]*	*1.40%*	*0.76%[5]*	*1.87%[5]*	*1.06%*
Tips on Energy Savings	*<0.96%[2]*	*<1.27%[2]*	*NA*	*0.32%*	*0.93%*	*0.48%*
Rebate Opportunities	*<0.96%[2]*	*<1.27%[2]*	*NA*	*1.11%*	*1.87%*	*1.32%*
Information on Renewable Energy Sources	*<0.96%[3]*	*<1.27%[3]*	*NA*	*<0.30%[6]*	*<0.37%[6]*	*NA*
Energy-Saving Products	*2.53%[2]*	*2.19%[2]*	*2.30%*	*1.77%[7]*	*4.74%[7]*	*2.57%*
Market Information	*1.20%[4]*	*<1.27%[2]*	*NA*	*0.92%[8]*	*0.81%[9]*	*0.89%*

Wave 1 Notes:

[1] Since "nexusredirect" 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.

[2] 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.

[3] The "products/detail" URL points to one of the ten product-specific pages, but does not indicate which particular product was visited.

[4] Only the page "headline" (1.20%) is found on the top 20 Exit pages by Visits list. It can be assumed that "elect_mkt_info" and "rtinfo" were each visited by less than 0.96% of visitors.

Wave 2 Notes:

[5] Since "nexusredirect" 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.

[6] None of the listed pages were found on the top 50 Exit pages by Visits. For December it can be inferred that each of these pages had less than 0.30% visitation rate, and less than 0.37% for January.

[7] The "products/detail" URL points to one of the ten product-specific pages, but does not indicate which particular product was visited.

[8] In November, only the page "elect_mkt_info" (0.92%) was on the list of top 50 Exit pages by Visits. It can be inferred that "rtinfo" and "headline" were visited by less than 0.30% of visitors (each). In December only "rtinfo" was not found on the list. It was visited by less than 0.37% 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

Exhibit 2-6
Table of Key Manufacturer Links

External Link Users Viewed	Total Number of Hits	November	December
www.pge.com	486	196	230
www.energystar.gov	59	36	23
www.andersonwindows.com	37	37	0
yosemite1.epa.gov	29	28	1
www.gelighting.com	20	13	7
www.lightsofamerica.com	20	14	6
www.enertron.com	19	13	6
www.milgard.com	18	12	6
www.consumerenergycenter.com	28	19	5
www.cardinalcorp.com	15	15	0
www.phlipslighting.com	15	9	6

2.2.4 Web Trends Path Summary

- Compared to Wave 1, fewer users are stopping on the Splash page, and are entering the California Energy Connection site. The number who did not explore past the Splash page dropped from 26% and 14% in December/January of Wave 1 to 7% and 12% in November and December of Wave 2.

- In Wave 2, more users are moving through the pilot registration path. In November and December of Wave 2, 35% and 37% of those who went to the pilot registration splash page completed the registration form. This compares to 20% and 40% in December and January of Wave 1.

- The most popular path over 4 pages long both involved pilot registration, in November 2003 pilot users who had registered returned to the site and found the My Home page. In December 2003 the most popular longest path shows pilot users entering on the pilot splash page, registering and entering the site. This compares to Wave 1 where the most popular longest paths were to the Analysis Tools.

- As with Wave 1, Wave 2 had a low incidence of paths with repeated pages versus those without repeated pages. This shows 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.

Top Paths Through Site by Visits

The "top paths by visits" illustrate the most frequently used paths through California Energy Connection Web site. 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.

November 2003: Top Paths Through Site by Visits			
Rank	**Percent**	**Path**	**Comments**
1	7.26%	1.  2.  3. **Pilot Registration (Residential)**	The **Pilot Registration** path (Residential) was the most common in November.
2	7.12%	1. 	The second-most common path started and left at the Splash page.
3	3.02%	1. **Pilot Registration**	As with the Splash page, users also began and left at the Pilot Registration page.
4	2.44%	1. 	While users did go through the registration steps in November (see #5), many stopped at the first page.
5	2.01%	1.  2.  3. **Pilot Registration (Residential)** 4. 	Two percent of total users completed the Residential pilot registration path.

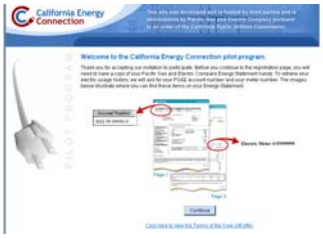
6	1.98%	1. **Registration Confirm**	Almost two percent of total users came in on the Registration Confirm page, but did not progress into the site.
7	1.64%	1. 	Like the Registration Confirm page, users found and left from the Pilot Registration page.
8	1.52%	1.  2.  3. **Pilot Registration (Business)**	The Pilot Registration for Business users path was visited at a lower rate than for Residential users (1.52% vs. 7.26)
9	1.47%	1. **Registration Confirm** 2.  3.  4.  5. 	From the Registration confirm page, users did navigate into the California Energy Connection site and to My Home.
10	1.36%	1.  2. 	Stopping at the data entry page was common for pilot users.

December 2003: Top Paths Through Site by Visits			
Rank	**Percent**	**Path**	**Comments**
1	11.65%	1. 	More users in December started and stopped at the Splash page than in November. They may not have been interested in entering the site.
2	4.42%	1. **/res/products/ detail.cal**	This unknown page was a frequent entry and exit page.
3	2.12%	1. 	The electricity marketplace page was another common path in December.
4	1.93%	1. 	Some users came into the login page, and then left the site.
5	1.87%	1. **Registration Confirm**	As with November, nearly 2% of users come into the Registration confirm page, but not into the home page.
6	1.81%	1. 	The Residential Welcome page was found by nearly two percent, but they also left from this page and did not explore the site.

7	1.62%	1. 	Electricity pricing information was found by users in December
8	1.31%	1. **Registration Confirm** 2.  3.  4.  5. 	Nearly the same percentage of users went from the registration confirmation to the My Home page in November and December.
9	1.25%	1. 	A number of users came into the site at the Rebate Finder; this path was not in the top ten in November.
10	1.25%	1. **/bus/products /detail.cal**	This unknown page was a frequent entry and exit page.

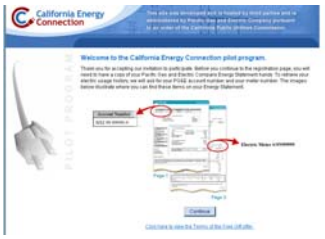
Top Pages by Visits

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 the California Energy Connection Web site 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 caluculator, returns to the Residential Home page, looks at the products page, then leaves -- the Residential Home page is counted as having had one visit.

November 2003: Top Pages by Visits				
Rank	**Percent**	**Page Image**	**Page URL**	**Comments**
1	9.64%		http://www.californiaenergyconnection.com/calecapp/ http://www.californiaenergyconnection.com/	The **Splash page** helps illustrate how many new users are coming to the Web site.
2	7.01%	**Pilot Registration**	http://www.californiaenergyconnection.com/calecapp/calec/pilotregistration/	The **Pilot Registration page** was also popuar, indicating that pilot invitees were getting to the registration area.
3	6.63%		http://www.californiaenergyconnection.com/respilot/	**Pilot Registration Splash page**
4	6.32%		http://www.californiaenergyconnection.com/calecapp/calec/res/pilotregistrationform/	**Pilot Registration Form** Nearly the same number of users visited both the Pilot Splash page and Pilot Registration form, showing that users are willing to investigate the registration process. This rate is higher than in Wave 1.

5	5.67%		http://www.californiaenergyconnection.com/calecapp/calec/	**Log in Page**
6	4.78%		http://www.californiaenergyconnection.com/calecapp/calec/residential_welcome/	**Residential Welcome Page**
7	4.45%		http://www.californiaenergyconnection.com/calecapp/calec/login/	**Login Page** The rate of visitation to this page shows how often registered users return to the California Energy Connection Web site.
8	4.04%		http://www.californiaenergyconnection.com/calecapp/calec/j_security_check/	**Login Page – Incorrect E-mail/Password** A number of users must have entered incorrect log in information.
9	4.02%		http://www.californiaenergyconnection.com/calecapp/calec/RegistrationConfirm	**Registration Confirmed page** (This page is displayed after the user receives the confirmation e-mail.) A significant number of users continued through the registration process.
10	2.94%		http://www.californiaenergyconnection.com/calecapp/calec/myhome	Some users found the **My Home** area, which is a new page for Wave 2.

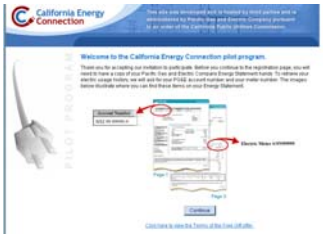
December 2003: Top Pages by Visits				
Rank	**Percent**	**Page Image**	**Page URL**	**Comments**
1	13.19%		http://www.californiaenergyconnection.com/calecapp/ http://www.californiaenergyconnection.com/	The **Splash page** helps illustrate how many new users are coming to the Web site.
2	6.57%		http://www.californiaenergyconnection.com/calecapp/calec/residential_welcome/	**Residential Welcome page**
3	3.92%		http://www.californiaenergyconnection.com/calecapp/calec/login/	**Login Page** Fewer users found the log in page in December compared to November.
4	3.55%	**/res/products/ detail.cal**	http://www.californiaenergyconnection.com/calecapp/calec/res/products/detail.cal	A number of users visited this page in the Products area.
5	3.38%		http://www.californiaenergyconnection.com/calecapp/calec/j_security_check/	**Login Page – Incorrect** **E-mail/Password**
6	3.12%		http://www.californiaenergyconnection.com/calecapp/calec/	**Login Page**

7	3.07%		http://www.californiaenergyconnection.com/calecapp/calec/RegistrationConfirm	**Registration Confirmed page** (This page is displayed after the user receives the confirmation e-mail.)
8	2.51%		http://www.californiaenergyconnection.com/calecapp/calec/res/products	Just over 2.5% of users visited the **Energy-Saving Products** main page.
9	2.46%		http://www.californiaenergyconnection.com/calecapp/calec/myhome	Some registered users did end up on the **My Home** page.
10	2.17%		http://www.californiaenergyconnection.com/respilot/	**Pilot Splash page**

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.

November 2003: Top Exits From Site by Visits				
Rank	**Percent**	**Page Image**	**Page URL**	**Comments**
1	16.09%	**Pilot Registration**	http://www.californiaenergyconnection.com/calecapp/calec/pilotregistration/	**Pilot Registration** was very common exit page, indicating that many users were attempting to register.
2	9.65%		http://www.californiaenergyconnection.com/calecapp/ http://www.californiaenergyconnection.com/	Around 10% of users left the **Splash page** without venturing into the site.
3	5.00%		http://www.californiaenergyconnection.com/calecapp/calecresidential_welcome/	**Residential Welcome page**
4	3.80%		http://www.californiaenergyconnection.com/calecapp/calec/pilotregistrationform/	**Pilot Registraion Form** Some users who started the registration process stopped at the form and did not continue.
5	3.57%		http://www.californiaenergyconnection.com/calecapp/calec/logout	In November, the **Logout page** was the last page seen by users, indicating that some were aware of the functionality.

6	3.20%		http://www.californiaenergyconnection.com/respilot/	**Pilot Splash page** This page may have not enticed users to continue/register for the California Energy Connection Web site.
7	3.11%		http://www.californiaenergyconnection.com/calecapp/calec/RegistrationConfirm	**Registration Confirmed Page** (This page is displayed after the user receives the confirmation e-mail.)
8	2.33%		http://www.californiaenergyconnection.com/calecapp/calec/login	**Login page** Users may have not decided to log in and left the site at this page.
9	2.26%		http://www.californiaenergyconnection.com/calecapp/calec/res/analyze	**Analyze Your Usage** Users may have decided that they did not want to use any of the audit tools or calculators.
10	1.98%		http://www.californiaenergyconnection.com/calecapp/calec/myhome	**My Home** That users left from My Home indicated that they had previously registerered and logged into the California Energy Connection Web site.

December 2003: Top Exits From Site by Visits				
Rank	**Percent**	**Page Image**	**Page URL**	**Comments**
1	13.02%		ttp://www.californiaenergyconnection.com/calecapp/ http://www.californiaenergyconnection.com/	**Splash page** This page was the most commonly exited-from page in Decmeber, showing that may user may have not been compelled to enter.
2	6.54%		http://www.californiaenergyconnection.com/calecapp/calec/residential_welcome/	**Residential Welcome page** The Residential Welcome page was a common exit page in December.
3	4.74%	**/res/products/ detail.cal**	http://www.californiaenergyconnection.com/calecapp/calec/res/products/detail.cal	A number of users visited this page in the Products area
4	3.87%		http://www.californiaenergyconnection.com/calecapp/calec/res/analyze	**Analyze Your Usage** Users may have decided that they did not want to use any of the audit tools or calculators.
5	2.93%	**Pilot Registration**	http://www.californiaenergyconnection.com/calecapp/calec/pilotregistration/	The **Pilot Registration page** had a much lower exit rate in December then November.

6	2.37%		http://www.californiaenergyconnection.com/calecapp/calec/login/	**Log In Page** Users may have not desired to log in to the site when given this page.
7	2.24%		http://www.californiaenergyconnection.com/calecapp/calec/elec_mkt_info/elec_mkt_operated/	**Electricity Market Place Info** Users may have been looking for this information and left after they found it.
8	2.18%		http://www.californiaenergyconnection.com/calecapp/calec/RegistrationConfirm	**Registration Confirmed Page** (This page is displayed after the user receives the confirmation e-mail.)
9	2.06%		http://www.californiaenergyconnection.com/calecapp/calec/elec_mkt_info/elec_mkt_priced/	**Electricity Market Pricing Info** Users may have been looking for this information and left after they found it.
10	1.93%		http://www.californiaenergyconnection.com/calecapp/calec/business_welcome/	While over 6% of users left from the Residential Home page, about 2% left from the **Business Home page**.

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.

Notes: "Wave 1 = Wave 2" states that the attribute has been kept over from Wave 1 to Wave 2.

"Wave 1 < Wave 2" maintains that this element has been improved in Wave 2.

"Wave 1 > Wave 2" remarks that the element's function has been reduced in Wave 2.

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 2003, of the 11 most common multi-page paths on the California Energy Connection Web site, all of them did not contain repeated pages. This suggests that users were able to navigate to the desired page(s) without becoming "lost". *(Wave 1 = Wave 2)*

- ✓ **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. *(Wave 1 = Wave 2)*

- ✓ **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. *(Wave 1 = Wave 2)*

- ✓ **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. (*Wave 1 = Wave 2)*

- ✓ **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. *(Wave 1 = Wave 2)*

- ✓ **"Highlights" such as Product Spotlight and Quick Tip 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. *(Wave 1 = Wave 2)*

- ✓ **The California Energy Connection logo does consistently link to the home page.** In Wave 1 it was noted that the logo did not consistently link to the home page. This has been changed for Wave 2. *(Wave 1 < Wave 2)*

- ✓ **The Business/Residential tabs follow conventional tab formatting.** In Wave 1 the deactivated tab was in red, and may have confused users into thinking that it was

Wave 1

Wave 2

activated. In Wave 2 the deactivated tab has been subdued with a light blue, and the active tab is the same color as the active menu. *(Wave 1 < Wave 2)*

2.3.2 Area-Specific Findings

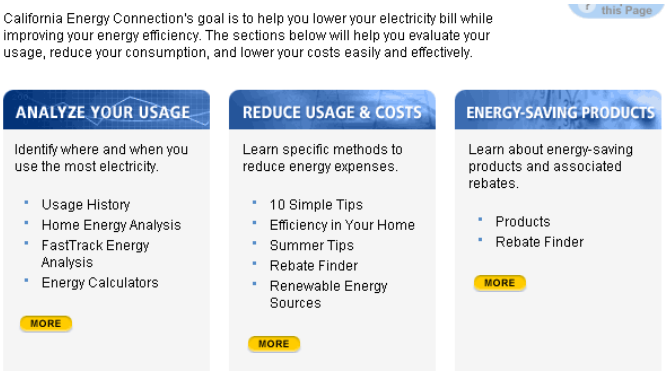
Overall, specific areas of the site are straightforward, informative, and easy to use. Furthermore, page layout and design is generally consistent throughout the site, which typically enhances the overall user experience.

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. (*Wave 1 = Wave 2)*

- ✓ **On the home page, main uses of the site are visible: Analyze, Reduce and Products.** The bulleted text, click-able headers, and yellow "More" buttons all give users immediate information and action items.



(Wave 1 < Wave 2)

✓ **The survey feature has been made more intuitive for users.** While during Wave 1 the label to vote was titled "Include my Vote," the label during Wave 2 is "Submit." The label "Submit" is a more recognizable term for the functionality of this button, especially within the voting context. Also in Wave 1 the page would refresh to the top of the screen, putting the results below the fold. This action has been modified for Wave two, and the page refreshes to the bottom of the screen and the results are readily apparent. *(Wave 1 < Wave 2)*

✓ **A number of conventional links have been added to the homepage: Home, About Us, Help, and Site Map.** These buttons/links are typically expected by users, and can help users find specific content without having to use the search functionality. *(Wave 1 < Wave 2)*

✗ **Along with the above buttons, another termed "Quick Find" has been added next to the search box.** Since this button has an unconventional name, users may not know what to expect when selecting it (and therefore may not use it.) Also, since it is in close proximity to the Search function, users may not understand that the features are not related. *(Wave > Wave 2)*

Analyze Your Usage

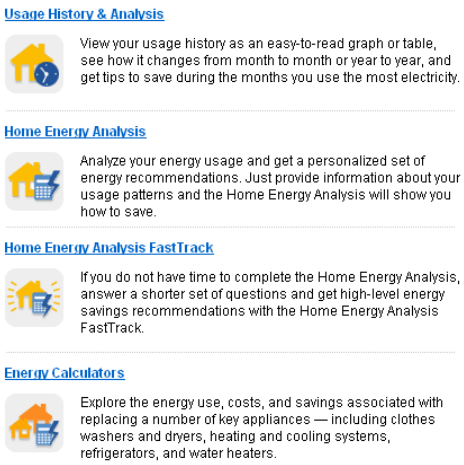
✓ **The Analyze Your Usage page now indicates that some tools require registration.** Not only has the information about logging in been added to the top of this page, a splash page showing screenshots of each tool has been added in-between the Analyze Your Usage page and the login page. These two changes from Wave 1 help users understand why logging in is necessary. *(Wave 1 < Wave 2)*

✓ **The Usage History tool descriptive text explains that users may have to enter their own data.** While this information is important and is an improvement over Wave 2, all users may not read the sentence in the block of descriptive text. This information may need to be highlighted. *(Wave 1 < Wave 2)*

- **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.** While text is included on the data entry page about where to find the specific data, it may help users if a graphic illustration is included.

✗ **Many links in the analysis section result in 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. *(Wave 1 = Wave 2)*

✗ **The Analyze Your Usage page does not clearly differentiate the analysis tools.** While the names (e.g. from "Usage History and Analysis" to "Usage History") and descriptions of the tools have been clarified from Wave 1, the blocks of text may not entice users to read the descriptions. As with the home page, bulleted text may be more appropriate for this page. Additionally, the icons that accompany each tool's description do not aid in clarifying each tool's specialty. *(Wave 1 = Wave 2)*



✗ **The design of the Home Energy Analysis tool is inconsistent from the rest of the California Energy Connection Web site.** Even though the California Energy Connection header has been included into the tools, this finding is the same as in Wave 1. Having a significantly different look and feel may be confusing to users, who must acquaint themselves with a new navigational system and visual design. *(Wave 1 = Wave 2)*

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. *(Wave 1 = Wave 2)*

Energy-Saving Products

✓ **The Rebate Finder has been included on the Products main page.** As found in Wave 1 testing, respondents typically went to the Products area to find rebates. Having the

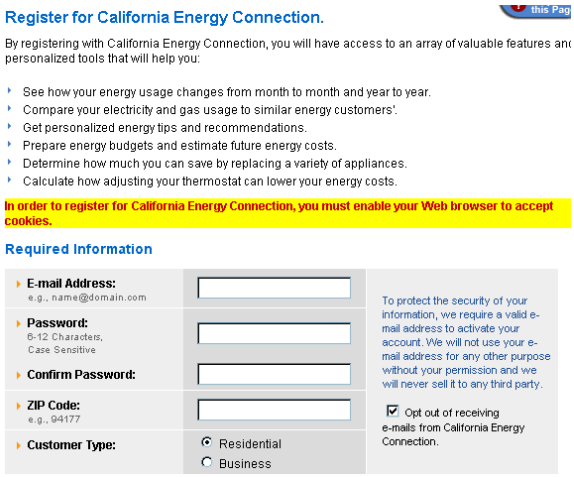
tool in this logical area helps users find desired information and increase awareness of the site's functionality. *(Wave 1 < Wave 2)*

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. (*Wave 1 = Wave 2)*

Registration

- ✓ **After clicking the Registration link on the California Energy Connection home page, users encounter a page containing specific benefits of registration and browser requirements for registration.** By providing concrete details on features accessible via registration, users are able to make an informed decision of whether or not to register. *(Wave 1 < Wave 2)*



- ✓ **The registration process itself is typical of similar sites;** the information required within registration is straightforward and is unlikely to cause difficulty for users. Also an opt-out selection box has been included. (*Wave 1 < Wave 2)*
- ✓ **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. (*Wave 1 = Wave 2)*
- ✓ Once users have logged in, the "Logout" button is used consistently throughout the site, and allows users to end their session at any time. (*Wave 1 = Wave 2)*

Web Site Tour

- ✓ **For Wave 2, the "Virtual Tour" has been renamed the "Web Site Tour."** This may help users understand that the tour is an illustration of the Web site, not a virtual tour of a energy-related facility. *(Wave 1 < Wave 2)*

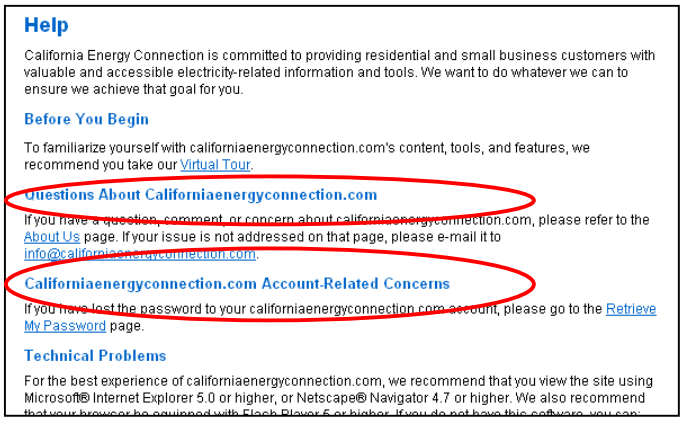
✓ **The Web Site Tour makes use of several "best practices" for Web usability.** The user's current location in the tour is visually differentiated from the other links in the navigation bar, and users are notified that some links will open in another window. This maximizes the control users have in navigating the tour. *(Wave 1 = Wave 2)*

Help

✓ **The "Help For this Page" link has been added to most pages.** This link helps users by providing page-specific contextual help. (*Wave 1 < Wave 2)*

✓ **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.



Help

California Energy Connection is committed to providing residential and small business customers with valuable and accessible electricity-related information and tools. We want to do whatever we can to ensure we achieve that goal for you.

Before You Begin

To familiarize yourself with californiaenergyconnection.com's content, tools, and features, we recommend you take our Virtual Tour.

Questions About Californiaenergyconnection.com

If you have a question, comment, or concern about californiaenergyconnection.com, please refer to the About Us page. If your issue is not addressed on that page, please e-mail it to info@californiaenergyconnection.com.

Californiaenergyconnection.com Account-Related Concerns

If you have lost the password to your californiaenergyconnection.com account, please go to the Retrieve My Password page.

Technical Problems

For the best experience of californiaenergyconnection.com, we recommend that you view the site using Microsoft® Internet Explorer 5.0 or higher, or Netscape® Navigator 4.7 or higher. We also recommend

2.4 WEB BENCHMARKING

This section benchmarks the California Energy Connection Web site against other, similar Web sites. The objective is to determine how comprehensive the California Energy Connection Web site is relative to other energy efficiency Web sites and whether there is a need for new or improved information on the site that will help California's consumers improve energy efficiency.

This benchmarking effort was guided by the California Energy Connection's stated mission: "to provide residential and small business electricity customers with information and tools to help them **analyze and evaluate their electricity usage and issues**, **effectively reduce their electricity consumption and costs**, **learn about techniques and products to improve their energy efficiency**, **understand recent and ongoing changes in the California electricity market**, and **get up-to-the-minute news on a range of electricity-related topics**." In keeping with this mission, we focused on two areas: (1) site content and (2) the audit tool. We developed a checklist of information and features to systematically benchmark five Web sites in

terms of content and four online audit tools with respect to their features and recommendations, presented in Exhibits 2-6 and 2-7, below.[1]

2.4.1 Site Content and Features

We benchmarked energy efficiency Web sites in several content areas:

- **Understanding energy bills.** How a customer uses energy is the starting point for any consideration of energy efficiency. For each Web site, we determined whether information was provided on customer's utility bills and costs, to help customers understand the price they pay for energy, the rates they see on their monthly energy bill, why bills vary and ways to manage their account.

- **Energy Analysis.** We highlight three online tools that help customers manage their energy use and their energy costs:

    1. Audit tool: an interactive tool that analyzes how a home or facility uses energy, how the customer's energy costs compare to that of similar homes, and how to reduce energy bills.

    2. Bill analyzer: an interactive tool that analyzes changes in a customer's energy bill (i.e. weather conditions, new appliances, living habits, etc)

    3. Appliance calculator: which identifies the energy use of all your appliances and estimate energy savings for smarter buying decisions.

- **Education and Information.** Web sites provide several types of information to educate consumers: (1) energy saving tips that offer practical ways to save energy and money in homes and businesses, (2) information about energy topics and energy-using technologies, (3) market and industry information. The CPUC specifically called for the California Energy Connection Web site to offer information on the state's electricity environment and energy industry.

- **Decision Support.** Decision support works in tandem with energy efficiency education to foster market activities that capture energy efficiency opportunities. Decision support content refers to product information, links to manufacturers, retail store finders, and program and rebate information.

We chose to benchmark the California Energy Connection Web site against five other consumer-oriented energy efficiency Web sites:

- **LBNL's Home Energy Saver** (www.homeenergysaver.lbl.gov). This Web site is designed to help consumers identify the best ways to save energy in their homes, and find the resources to make these savings happen. The Home Energy Saver is based on

[1] Online audit products have been extensively reviewed in two previous studies, LBNL's *Review and Comparison of Web-and Disk-based Tools for Residential Energy Analysis* and a 2001 California Energy Commission report, *Home Energy Analysis Software Study*. These studies are included in the Appendix of this report.

methods to estimate energy consumption and savings developed at Lawrence Berkeley National Laboratory.

- **PG&E** (www.pge.com). PGE.com is representative of the online offerings of the four California investor-owned utilities (IOUs), who recently made their rebates and online audits consistent statewide.[2] The value of the California Energy Connection Web site, designed to serve Californians, must be considered in light of other resources available to California consumers.

- **Flex Your Power** (www.fypower.com). Another California energy efficiency resource is the Flex Your Power Web site, which promotes energy efficiency in partnership with the state's four investor-owned utilities (IOUs), municipal electric utilities and other public and private sector participants. The Flex Your Power campaign is responsible for implementing statewide energy efficiency marketing and outreach efforts in the State of California.

- **Wisconsin Public Service** (www.wisconsinpublicservice.com). Wisconsin Public Service, a natural gas and electric utility serving parts of Wisconsin and Michigan, has comprehensive, customer-centric online resources.

- **The Alliance to Save Energy** (www.ase.org). A nonprofit group that supports energy efficiency. ASE's Web site includes consumer-oriented information on cutting energy bills.

Results are presented in Exhibit 2-6 below. We examined the content and features of five Web sites, as well as the California Energy Connection Web site in the four major areas described above: energy bills and usage, energy analysis, decision support and information/education. Web site content and features are denoted by their presence (full circle), absence (empty circle), or by a link to another Web site (half circle).

[2] In response to a CPUC directive, the four California IOUs coordinated audit and product rebates for residential and nonresidential markets (rebates offered by the statewide Single Family Energy Efficiency Rebates program and the statewide Express Efficiency program). For these programs, the IOUs offer standardized rebates, applications, product specifications, marketing materials.

Exhibit 2-6
Comparison of Web Site Content and Features

	California Energy Connection	PGE.com	Flex Your Power	Alliance to Save Energy	Wisconsin	LBNL
Energy Bills and Usage						
Regional Cost Comparison	●	●	●	●	●	●
Why Bills Vary	●	●	●	●	●	●
Customer Account Management	●	●	●	●	●	●
Energy Analysis						
Bill Analyzer	●	●	●	●	●	●
Appliance Calculator	●	●	●	●	●	●
Audit Tool	●	●	●	●	●	●
Decision Support						
Product information	●	●	●	●	●	●
Manufacturer links	●	●	●	●	●	●
Store finder	●	●	●	●	●	●
Contractor Selection	●	●	●	●	●	●
Program/Rebate information	●	●	●	●	●	●
Education and Information						
Energy Saving Tips	●	●	●	●	●	●
Information about energy topics and technologies	●	●	●	●	●	●
Market/industry information						
energy rates	●	●	●	●	●	●
industry news	●	●	●	●	●	●

Present	●
Absent	●
Link	●

Overall, the California Energy Connection Web site performs on par with its peers. We found that utilities – namely PG&E and Wisconsin Public Service – offered the most comprehensive Web sites. California Energy Connection is as comprehensive as these utility Web sites. Its strengths lie in energy analysis and education/information. The California Energy Connection Web site rivals PG&E and Wisconsin Public Services in terms of comprehensiveness.

- **Understanding Energy Bills**. The California Energy Connection Web site offers customers a good understanding of why their energy bills vary (i.e. weather conditions, appliance usage, living habits, etc). Unlike Wisconsin, which offers a regional cost comparison, there is no attempt made to benchmark Californians' energy rates to other consumers outside the state. Such information can help Californians understand the California electricity market and the energy costs they pay. Customers of the California IOUs that visit the California Energy Connection Web site are unable to manage their utility account there (because the California Energy Connection does not have access to the IOUs billing data), whereas a full-service Web site, like PGE.com, can bundle account management and energy efficiency opportunities.

- **Energy Analysis**. The California Energy Connection Web site makes a suite of interactive tools (audit tool, bill analyzer and appliance calculator) available to users. Only Wisconsin offers such comprehensive analysis services to customers.

- **Decision Support.** California Energy Connection offers product information, manufacturer links and program and rebate information, all of which help move customers closer to buying energy efficient products. Other Web sites offer retail store finders that link consumers directly to store inventories. Plugging customers into a retail store would enhance the decision support offered by the California Energy Connection Web site. Such an improvement could be as simple as adding a link to Flex Your Power.com's store locator.

- **Education and Information**. The California Energy Connection Web site stands out relative to its peers in providing in-depth information on the state's electricity environment and the latest energy industry news. The LBNL site offers more comprehensive information on energy topics (such as information on non-energy benefits and remodeling), but does not address market/industry information. Flex Your Power offers wide-ranging information resources to consumers by linking them to existing sites.

2.4.2 Audit Tool

The cornerstone of the California Energy Connection Web site is the interactive tools to help customers analyze and evaluate their usage. Therefore, we compare the Nexus California Energy Connection audit tool embedded in the California Energy Connection Web site to four other energy analysis tools – Xenergy's RECAP tool, Volt's HomeVIEW, Enercom's Energy Depot for Homes, and LBNL's Home Energy Saver.[3] This audit benchmarking effort focuses three specific areas:

- **Managing Customer Expectations**: audits require several inputs from the customer (i.e. old utility bills, thermostat setpoint, etc) as well as considerable time. Are tools clear up front about the time needed to complete the audit? Do they offer a printable checklist of information needed to complete the audit?

- **Usability**. Three issues are considered: (1) Are users able to save information and return to the site for multiple sessions? (2) Does the tool offer options for a fast, high-level and longer, more detailed analysis? (3) Does the tool adequately explain outputs and recommendations?

- **Audit Recommendations**. Recommendations are the critical output, the best information a customer may access to help make his space more energy efficient. Do recommendations offer estimates of potential savings and costs to implement the measures? Is there a short list of recommendations ranked by return on investment? Does the recommendation give a customer an idea of whether the action is a low/no

[3] Certain features and customization options were not available in the demonstration versions of Volt and Energy Depot products that we reviewed.

cost, or an investment-grade measure? Does the recommendation identify any non-energy benefits associated with the measure, such as water savings or emission reductions?

Exhibit 2-7 displays audit benchmark results along three dimensions: managing customer expectations, usability and recommendations

Exhibit 2-7
Audit Tool Comparison

	Nexus	Xenergy	Volt	Energy Depot	LBNL
Managing Customer Expectations					
Checklist of information needed to complete audit	●	●	●	●	●
Time needed to complete audit	●	●	●	●	●
Usability					
Savable information/multiple sessions	●	●	*	●	●
Fast track versus detailed	●	●	*	●	●
Comprehensive description of measure	●	●	●	●	●
Web link to relevant utility programs (rebates, O&M)	●	●	●	●	●
Recommendations					
Include estimates of potential savings	●	●	●	●	●
Include estimate of measure cost	●	●	●	●	●
Include low/no cost measures	●	●	●	●	●
Include estimates of non-energy benefits	●	●	●	●	●
Include investments	●	●	●	●	●
Rank top recommendations by ROI	●	●	●	●	●

*Certain features and customization options were not available in the demonstration versions of Volt and Energy

Yes	●
Somewhat	●
No	●

California Energy Connection's Nexus audit tool performs as well as or better than the other tools reviewed.

Managing Customer Expectations. Few audit tools, including the Nexus product, adequately manage customer expectations about the time or inputs required in the audit process. Only Xenergy's RECAP tool tells users "What You'll Need to Complete The Survey" – namely, the first five letters of your name as printed on your bill, your utility account number, and about fifteen minutes of your time." Xenergy also tells users "What You'll Get From The Survey." Energy Depot has a counter feature (0-100% complete) that tells users how close they are to finishing the survey. However, no vendor offer users a printable checklist that customers can use to gather the information needed from their home or business (i.e. utility bill, thermostat

setpoint) in order to complete the survey.[4] A printable checklist to aid users so they can gather information necessary to complete the audit is important for audit tools that require numerous inputs in order to offer detailed recommendations. A checklist helps ensure that customers input valid data, instead of guessing at inputs off the top of their head.

Usability. California Energy Connection's Nexus audit tool performs well in terms of usability, allowing customers to save their inputs and conduct a "fast track" audit. California Energy Connection's Nexus tool was more descriptive than other tools, explaining the recommendations in detail, how to implement them (i.e. whether a contractor is needed), cautioning the user about the drawbacks of certain measures. Offering these pros and cons help users make decisions about implementing recommendations. Other tools only offer one line of text about a recommended measure. Nexus audit recommendations also stand apart from other products in that non-energy benefits, such as CO2 and water savings, are listed.

California Energy Connection's Nexus tool helps customers prioritize potential measures by giving them a better expectation of savings and the level of effort involved in implementing a measure. Because the Nexus audit tool provides measure cost and savings information and more "how to" information," it appears to be more customized and specific than some of the other sites' measure lists, which are more generic.

One feature lacking in the California Energy Connection tool is an electronic link from recommendation to energy efficiency programs and rebate offerings. Xenergy's audit tool directly links customers to relevant rebate opportunities. For example, Tampa Electric customers who complete Xenergy's home survey and receive the recommendation, "Have Your Duct System Sealed," have the opportunity to click on a link to TECO's ductwork program:

> "Our Ductwork (www.tampaelectric.com/TEESHMDuctwork.cfm) Program will have a trained professional appraise your home's duct system, seal any leaks and help minimize future leaks - all for only $79*!"

Providing links to utility programs, such as rebates, O&M programs, offers strong decision support to customers.

Audit Recommendations. California Energy Connection's Nexus tool, like most others, estimates the potential savings for each recommendation. Nexus offers numerous recommendations, each with more than enough descriptive information on each measure. However, the tool does not rank the recommendations by return on investment or provide a short list of cost-effective recommendations, forcing users to sort through voluminous information to make that determination. The Nexus tool provides the inputs necessary to estimate payback and cost-effectiveness (i.e., costs and savings), but does not perform the calculation for the user. Furthermore, the Nexus tool provides recommendations that are not cost-effective and have payback periods exceeding 10 years. Therefore, it would be very useful to provide a payback calculation, and/or identify the measures that are more cost-effective (or

[4] As discussed in Chapter 4, the large majority of respondents in the online customer survey indicated that they would find it very useful to have a printable checklist of information needed to input into the audit tool (such as type of appliances in your home) before doing the audit.

perhaps allow the list of recommendations to be sortable by various parameters, such as payback).

By contrast, the Xenergy tool produced two pages of recommendations that highlights payback for the top three measures (or those with payback of one year). Nexus users, who may be frustrated by the volume of information before them, would benefit from a top line summary. Additionally, reporting options – top line summary versus detailed descriptions – could be offered to users.

2.4.3 Usability Issues

Our benchmarking analysis also examined issues related to site usability. Below, we briefly summarize the pros and cons of competitor sites.

Wisconsin Public Service – Nexus (www.wisconsinpublicservice.com/home/saving.asp)

- ✓ The Wisconsin Public Service (WPS) Web site uses the same Nexus tools as the California Energy Connection Web site. This results in the site having similar content to the California Energy Connection Web site, but delivered with different text and instructions.
- ✓ The WPS site clearly differentiates between Detailed and Quick analysis for the Home Energy Analysis tools. It is simple for users to select one type without having to read the explanatory text. This page also sets expectations for the amount of time needed to complete the tool, and different versions of detailed analysis (import energy use data or enter your own).
- ✗ This site does not give users the Usage History tool, or provide links to recommended products other then those on the Energy Star and Energy Guide Web sites. Nor does the site inform users for the appropriate tools that a login is required.

Enercom - Energy Depot

- ✓ Enercom tools were accessed through a demo site: *www.energydepot.com/product_tour/edhomes.asp.* Using the energy audit was similar to the Nexus tools on the California Energy Connection Web site, and the results incorporate both graphs of energy usage and relevant recommendations. One useful feature during the survey is the status bar at the top of the page. This element lets users know approximately how many questions are left in the survey.

Volt VIEWTech (www.voltviewtech.com/homeview.htm)

- ✓ The VIEWTech audit tool asks similar questions to the other energy use surveys, including heating and cooling information, home size and age, and about electric appliance use. In addition, it does ask in detail about the rating of home insulation, windows, and doors. Some of this detail may be unknown to users and no alternative points of reference are included.

✗ The results do show energy costs (in dollars) of individual appliances, but do not give any comparisons to typical or average household costs for these items. Recommendations are included at the bottom of the results page.

Lawrence Berkeley National Laboratory (homeenergysaver.lbl.gov/)

✓ The LBL tool provides detailed information about costs of appliances and energy use, as well as possible savings for using energy efficient products. It also includes pollution ratings for the user's house and recommendations with specific manufacturer's products.

✗ Using the survey could be difficult for users. On the first survey page it is not apparent that there are more questions than those shown. Also, since the questions are in a single frame at the bottom of the page, screen space is not utilized well.

Alliance to Save Energy (www.ase.org/checkup/home/main.html) -- AES

✓ The AES audit is one of the shortest in the sample, and does provide actual dollar figures for personalized energy costs and savings. The audit is simple to fill out with all the answers on drop-down menus.

✗ One drawback to the AES survey is that it does not provide users with enough immediate detail about how to answer many of the questions. The Efficiency Measures section asks users to qualify their appliances ("components") as "high, medium or low." The only way to determine this qualification is to click a separate button ("estimate") for each component. The summary also does not present users with any specific product recommendations.

Pacific Gas and Electric (www.pge.com/003_save_energy/003a_res/index.shtml) -- Nexus

✓ The Home Energy Survey area provides users with the same Nexus tools as seen in the California Energy Connection and WPS Web sites. PG&E only provides immediate access to the FastTrack audit tool, allowing users to proceed to the detailed analysis after completing the FastTrack survey.

✗ Once the detailed analysis tool is started, the image of the house does not fit into the space provided. This requires users to scroll vertically and horizontally to read instructions and find appliances to modify.

✗ The PG&E Web site also keeps the site's navigation bar to the right of the energy audit tools. This may confuse users who assume this the links on the navigations bar are part of the audit tool itself.

2.4.4 Summary of Benchmarking Findings and Recommendations

The California Energy Connection Web site compares very favorably to its peers. Benchmarking findings indicate that the California Energy Connection Web Site has fulfilled its mandate, "to provide residential and small business electricity customers with information and tools to help them analyze and evaluate their electricity usage and issues, effectively reduce their electricity consumption and costs, learn about techniques and products to improve their

energy efficiency, understand recent and ongoing changes in the California electricity market, and get up-to-the-minute news on a range of electricity-related topics."

Benchmarking findings suggest that the California Energy Connection Web Site could be strengthened in the following ways:

- Link to utility customer information (like PGE.com and Wisconsin) to enable customer account management.

- Add a retail store (or contractor) finder that links consumers directly to stores.

- Add a printable checklist that customers can use to gather the information needed from their home or business (i.e. utility bill, thermostat setpoint) in order to complete the survey. Some of the tools we evaluated would not benefit from a checklist because relatively few inputs are required. The Nexus California Energy Connection tool, however, is detailed enough that customers would benefit from this feature. Customer survey responses support this. A printable checklist would serve as a quality control feature and could potentially reduce attrition, as some customers do not complete the survey due to the unexpected data and time demands of the audit tool.

- Manage the customers as to the time needed to complete the survey and status of the progress towards completion while performing the audit.

- Link audit recommendations directly to utility rebate and O&M programs.

- Create a summary list that sorts recommendations by cost-effectiveness and/or highlights key cost-effective measures.

2.5 SUMMARY OF FINDINGS AND RECOMMENDATIONS

Generally, the California Energy Connection Web site provides users with detailed information and actionable data. These two facets help create a site that does provide value to users, and help maintain an interactive relationship between the users and the site. Below is a summary of key strengths and issues in terms of usability, as well as recommendations from the benchmarking assessment:

2.5.1 Web Site Usage (based on Web server log data)

- More users visited the Web site in 2003. The number of unique visitors in November 2002 was nearly triple the amount in November 2003. Likewise, more users moved through the pilot registration path in 2003 than 2002. However, traffic dropped off sharply in December 2003, suggesting the visitation was largely driven by PG&E mailers sent to approximately 17,238 customers in November 2003. Customer survey findings in Chapter 4 confirm these web statistics are consistent with 2002 results; the majority of users stated that they visited the site in order to get a free gift.

- The most popular information areas in November-December 2003 were Energy-saving Products and Analysis Tools. However, visits to Analysis Tools dropped off in Year 2, as did Energy Saving Tips. These path statistics are consistent with customer survey results; far less customers reported that they visited the site in order to use the audit tool. By contrast, Energy-saving Products and Rebate Opportunities gained popularity in 2003.

- Users spent far less time at the Web site in 2003. The average length of a visit in December 2003 fell to five minutes, compared with 11 minutes the previous December. In 2003, the longest path typically involved three things: splash page entry, registration and site entry. By contrast, 2002 users tended to enter, register, and visit the Analysis Tools.

2.5.2 California Energy Connection Strengths

- ✓ The purpose and function of the site are immediately clear upon visiting the homepage and splash page.
- ✓ 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.
- ✓ Icons help users differentiate information and links, and also provide an attractive interface.
- ✓ Navigation throughout the site is consistent and provides a stable structure in which users can easily find information/content.
- ✓ Navigation elements (links and buttons) are consistent and easily recognizable.
- ✓ High-level organization of information and corresponding section nomenclature are intuitive; Residential and Business content is clearly distinguished.
- ✓ Content is comprehensive, including specific information about products and the electricity market in California.
- ✓ Personalized information is provided, giving users a reason to return to the site.

2.5.3 Usability Issues

- ✗ The URL is long and may not be intuitive or memorable to users.
- ✗ While the site does indicate that registration and past bills are necessary for the audit tools, this information might be passed over by users.
- ✗ The benefits and availability of My Home page are clearly communicated to users.

2.5.4 Benchmarking Assessment

Results of the benchmarking assessment of competitor sites suggests that the California Energy Connection Web Site could be strengthened by:

- Linking to utility customer information (like PGE.com and Wisconsin) to enable customer account management.

- Adding a retail store (or contractor) finder that links consumers directly to stores.

- Adding a printable checklist that customers can use to gather the information needed from their home or business (i.e. utility bill, thermostat setpoint) in order to complete the survey.
  - Customers would benefit from this feature because the Nexus California Energy Connection tool required numerous inputs in order to generate detailed outputs.
  - A printable checklist would serve as a quality control feature and could potentially reduce attrition, as some customers do not complete the survey due to the unexpected data and time demands of the audit tool.

- Informing customers about the time needed to complete the survey and status of the progress towards completion while performing the audit.

- Linking audit recommendations directly to utility rebate and O&M programs.

- Creating a summary list that sorts recommendations by cost-effectiveness and/or highlights key cost-effective measures.

3. USABILITY RESEARCH

3.1 BACKGROUND AND OBJECTIVES

This chapter reports results from the Year 2 usability assessment of California Energy Connection Web site, in terms of ease of use and navigation. The first tests were conducted in December 2002. Modifications made based on the first wave of testing were examined in Year 2, as well as consistent features and functions. The second wave of Usability testing, conducted in November 2003, included many of the same tasks that were conducted in the first wave of Usability testing, as well as some additional tasks added in Year 2.

This unbiased, third-party assessment of user feedback gathered during the usability testing 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.

Specific research objectives and goals 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 users' 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.

3.2 RESEARCH METHODOLOGY

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 November 20th and 21st, 2003.

Respondents were asked to complete specific tasks, which allowed them to explore the California Energy Connection 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 a usage analysis (audit); locate

information on specific products and manufacturers; find recommendations on energy-saving behaviors; 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.

3.2.1 Sample Audience

A total of sixteen interviews were conducted over two days, and each respondent was recruited to represent the following characteristics:

- All were PG&E customers;

- 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).

3.3 CHAPTER ROADMAP

Each section details issues uncovered in the usability research and recommendations for addressing these issues. In addition, key issues and recommendations are summarized in the final section. Most of these recommendations were proposed by users themselves. We also include our own recommendations as possible solutions to the issues that arose in testing, based on our expertise from conducting hundreds of user experience testing world-wide, as well as industry best practices.

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 of the site the issue is related to.

It is important to note that 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.

3.4 DETAILED 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 the conclusion section, and includes additional recommendations based on all facets of the study (e.g., heuristic evaluation, WebTrends 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.

Additionally, feedback from the usability interviews revealed similarities and differences from the Wave 1 testing. Reasons for any differences include: 1) small sample sizes, and 2) changes made to the Web site after the Wave 1 testing.

Since the sample size for each wave of testing was small (16), variances in attitudes by a small number of respondents can result in differing findings. The primary usefulness of usability testing resides in usability issues, which is illustrated by the user behavior.

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 terms below are used to describe the frequency with which comments were heard: most, or nearly all; many; some; few.

3.4.1 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 California Energy Connection Web site, respondents agreed they found the Web site a useful resource, and commented they would be somewhat likely to visit the site in the future.

- When asked if they had visited a web site like the one described, some mentioned that they had visited PG&E's Web site. Generally these respondents had been looking for billing/account details or information about PG&E as a company.

- However, most respondents stated that they had not visited a Web site like the one given in the description, and respondents did not have many expectations about how this Web site would work. Many mentioned that there might be tips about how to reduce energy use, educational materials, and information about the energy market, including an industry-term glossary. A few assumed that their own electricity use would be accessible on this Web site.

- Respondents tended to associate the described Web site with PG&E; most assumed that PG&E would promote this site. Other companies mentioned were *"another energy company," "a big company, like Chevron*," the state of California, the Green Party, and environmental groups.

- Residential respondents stated that the most likely users of this site would be homeowners and individual energy consumers. A few noted that businesses would most likely have someone who reviewed energy usage to keep costs low. Business respondents assumed that both residential and business energy customers would use the site, but small/medium businesses would get the most value.

- 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.

"This site will help me analyze my usage, find ways to save money, and find energy-efficient products…I see the three main areas"

3.4.2 Site Recommendations

- 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.

- Layout/Design
  - Consider adding more graphical representation on Splash page that will entice users to enter and explore. Users responded overall to images (including clickable links and images) more than text.

3.4.3 Splash Page/Homepage Exploration

Users were next allowed to launch the Splash page and then navigate to the Homepage.

Splash Page

- While most respondents read through the text on the Splash page, a few noted that they would go right to either the "Residential" or "Business" button. All respondents were able to correctly self-select the appropriate button.

- Some respondents saw the PG&E and CPUC text at the top of the page, which met with the expectations of many respondents. One or two respondents were interested in knowing that PG&E was *"mandated"* to create this Web site by the CPUC. One or two also wondered why *"this site isn't part of PG&E."* These respondents had a positive perception of PG&E and expected that company to provide energy conservation information.

- Some respondents were surprised to see information about "products" on the screen, but the information about energy saving and market information was expected. Some respondents also liked the three main areas, *"It looks like if I do these things and it'll help me lower my bill."* Most noted, *"it looks like this site has a lot of information."*

Homepage

- Generally, respondents initially noticed the three boxes in the main content area of the homepage. Most respondents remembered these three areas, *Analyze Your Usage*, *Reduce Usage and Costs*, and *Energy Saving Products,* from the Splash page. Nearly all respondents commented that they would start in one of these areas, with many choosing to start with *Analyze Your Usage*.

- Some respondents had concerns about the Energy Saving Products area, assuming that the companies listed might have a business relationship with California Energy Connection Web site.

- Most respondents liked the look and feel of the Homepage. The colors were liked by most, and one or two commented that the lack of *"flash"* or *"moving things"* was a positive aspect of the page. A few respondents also mentioned that the links/button in yellow were easy to see and presented obvious places to click.

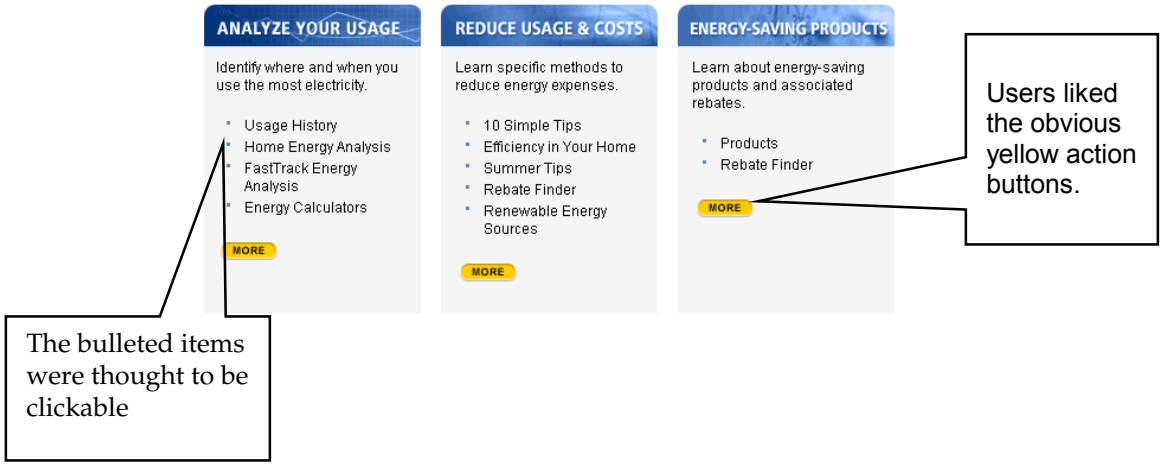
- One or two respondents stated that the left navigation menu was *"repetitive"* since the top three items were replicated in the main content area. It should be noted that once respondents were in other areas of the site, they did use the left navigation menu.

- The market information was liked by some, but unwanted by others. Business respondents tended to ignore this area and concentrate on the elements that could directly affect their business' energy use. Residential respondents were more interested in market information, as well as understanding how the electricity system operates. Concerning the specific market information, while some respondents stated that the up-to-date "system load" information might be interesting; most commented that they would like to see information about how the electricity system or "grid" works, specifically how electricity is produced and how it is transferred to homes and businesses.

- Removing the Step nomenclature (as seen in Wave 1) allowed respondents to assume that they could start anywhere on the site. While one or two said they would first go to *Analyze Your Usage*, then *Reduce Usage & Costs*, and finally *Energy-Saving Products*, most assumed they could start in any of the three main sections.

- Overall, users stated that the homepage was well organized and adequately displayed their options. Most said that "it is clear that you can analyze you use, find out ways to lower your bill, and then look for efficient products."

- One or two users mentioned that the yellow Go/More buttons were clearly labeled and easy to find. The visible coloring helped users know where to click when navigating deeper into the Web site. They also compare favorably to Wave 1 where there was a "Step 1, 2, 3" format for the three main content areas and respondents noted that the Go links did not work well in a step-based model.
  - However, a few respondents did try to click the bulleted items in each of the area blocks. These users expected that the text would be links directly into each tool.



- Several users also noted the Web Site Tour. These users were able to identify that the tour was of the Web site, although most reported they would not use it. Compared to Wave 1, the change in nomenclature from "Virtual Tour" to "Web Site Tour" helped users understand that the tour is for the Web site, not a tour of an energy efficient house.

- Respondent were asked specifically about the Quick Find and Search links at the top of the page. Users were not able to discern a difference between the two features, even after using both them. One or two respondents who used the Quick Find did not notice the results at the bottom of the Quick Find box. The Search results tended to have more items and be noticeable compared to Quick Find.

Splash Page/ Homepage Recommendations

- Content

- Consider making the bulleted text in the three modules (Analyze Your Usage, Reduce Usage & Costs, Energy-Saving Products) link to the appropriate tools.
- Remove the Quick Find feature: users did not find value in it and were confused about its purpose. To search the site respondents used the Search feature.

3.4.4 User Tasks

As part of the usability test, respondents were asked to find specific pieces of information called "tasks." Users began some tasks at the California Energy Connection Web site home page, and others from My Homepage. 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.

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).

- About half of the respondents were not given pilot user information. These respondents were required to log in or register once they clicked onto one of the tools or functions of the site. Nearly all of these respondents questioned why they were being asked to register to use parts of the Web site. Most were concerned that if they registered, that they would receive unsolicited commercial e-mail. From Wave 1, an intermediate page with screenshots of the selected tool was shown to users before the login/registration page. Most noted the images on this page, but did not comment or note on the text explaining that registration was required to use the tools.

- A few respondents did visit the registration page and noted, *"it doesn't ask for much, just my ZIP code."* These respondents felt that the registration process was minimal and non-intrusive. Some also stated that if they knew the benefits of using the site, they would be more apt to register. This attitude was similar to those found in Wave 1.

- Since the functionality had not changed since Wave 1, users were not asked to register a new account and were given a pre-registered ID and password. In Wave 1 it was noted that registration and login were frustrating for user, especially since most perceived the Web site as providing general information. Respondents in both waves cited concerns about the potential for unsolicited commercial e-mail if they register an e-mail address. After Wave 2, an opt-out option was included below the e-mail address field, which respondents stated that they would use this feature.

Login Recommendations

- Registration

  Revisit registration functionality by carefully considering the following:

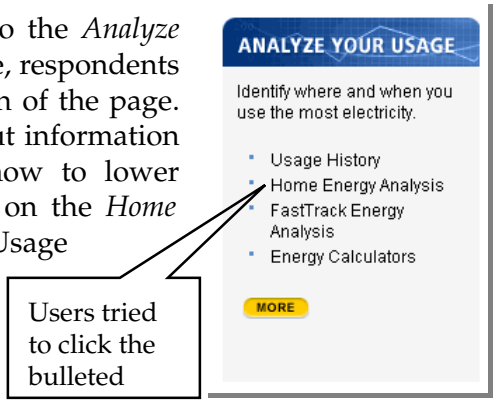
  - Decide whether users really do need to register on the Web site to use features, and if so, impress upon users why this is so (give them a call to action) by clearly outlining the benefits of registration.

– 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.

Task: Fast Track Energy Analysis (Residential only)

For this task, residential respondents were asked to "find out why your bills are more than double your neighbor's and how you can lower them."

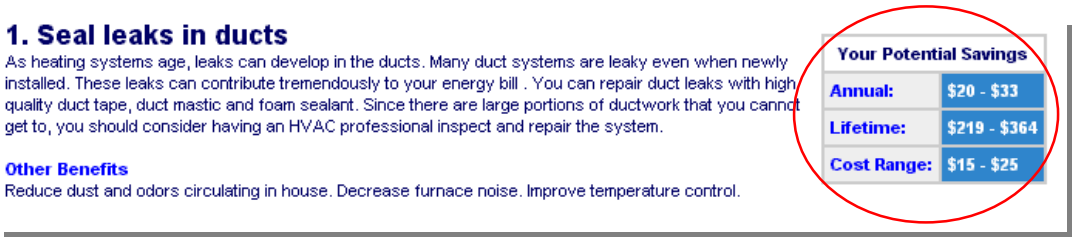
- To start this task, respondents generally looked to the *Analyze Your Usage* area. When starting from the homepage, respondents clicked into this area from the main content section of the page. Most respondents stated that they expected to input information about their use and get recommendations on how to lower electricity bill. A few respondents tried to click on the *Home Energy Analysis* line of text in the Analyze Your Usage box on the homepage. These respondents expected the text to be a link directly to the analyzer.



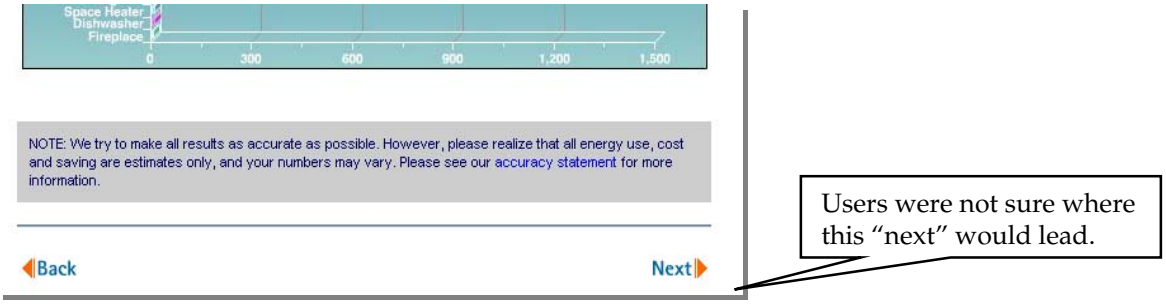
- One the *Analyze Your Usage* page, respondents most often correctly clicked into the *Home Energy Analysis*, with one or two using the *Fast Track Energy Analysis*.

- Respondents found the first page of questions on the *Home Energy Analysis >> FastTrack* to be *"easy."* Respondents were able to identify and answer each of the questions. One respondent, however, was not sure which house to select, she stated, *"I have a detached townhouse, it's not on here."*

- The first page of results in the *Fast Track* was interesting to users, and users like the Saving Options details. Most also found the details for the options, but said that they would like to see more descriptions/images. The savings information was *"useful"*, however.



- Those respondents who used the *Home Energy Analysis* found the subsequent page with energy appliance use detail. Respondents expected that filling out this information would result in specific recommendations on how to reduce electricity use, and therefore costs. It was not clear to some that clicking "Next" would take them to detailed questions.



Fast Track Energy Analysis Recommendations

- Content
  - Present users with more information about the results of the Analyzers before they are asked questions. For example, "What you get" showing potential results may motivate users to use the audits.
  - Bullet the differences between FastTrack and Home Energy Analysis. Users tended not to read the descriptions on the Analyze Your Usage page.
  - Showing examples of the Savings Options in the Analyze Your Usage page may also help users differentiate between the audits, and entice them to use the tools.
- Nomenclature/Navigation
  - Include more descriptors with navigation elements, e.g. "Next: Detailed Analysis."

Task: Business Energy Analysis/Usage History (Business only)

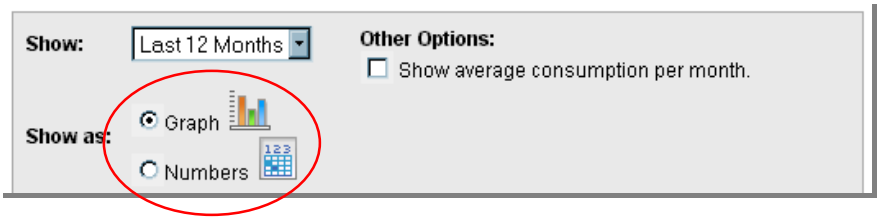
Business respondents were asked to find out how much energy various pieces of equipment consume and tips for lowering energy usage.

- A number of business respondents used the Usage History tool to complete this task, these results are shown here, and the results of those who use the Business Energy Analysis are shown later.
- For this task, business respondents had more difficulty finding the Business Energy Analyzer than residential respondents did finding the Home Energy Analysis. Business respondents tried 10 Simple Tips, Efficiency in Your Business, as well as Usage History.
- Non-pilot respondents who visited Usage History stated that they would not take the time to manually enter all their billing information. Billing data was only loaded for pilot users, not for non-pilot users, and one or two mentioned that they keep their records separate from their computer, and it would be "too much work" to retrieve the bills and enter in the information. Non-pilot respondents also were not sure that the effort of inputting the data would be worth the benefit of seeing a chart.

  "I would have to go into another room to get my bills, I don't think I'm going to do that."

  "I can just look through my bills and see which months I used the most."

- Respondents were easily able to identify the format of the succeeding chart from the Viewing Options listed. The icons for the Graph and Numbers were useful.



- The results of the *Usage History* were somewhat useful to respondents. The graphical form illustrating which months had high electricity usage was useful to some. The recommendations, however, were "too general" and were reportedly of little use. One respondent repeatedly clicked the "Analyze Data" button expecting more than just the usage charts.

- After correctly using the *Business Energy Analysis*, one or two respondents mentioned that they would like a link from the results of the *Usage History* tool to the *Business Energy Analysis* function.

- Once in the *Business Energy Analysis*, respondents were able to fill out the data to find specific recommendations. However, most respondents were not sure how long the process would last. Generally, respondents who finished the analyzer stated that there were *"too many questions, I don't have time for this."* Only one respondent found value in completing all the analyzer questions.

Business Energy Analysis/Usage History Recommendations

- Content
  - Present users with more information about the results of the Analyzers before they are asked questions. For example, "What you get" showing potential results may motivate users to use the audits.

- Content/Usage History
  - Inform users upfront that in order to complete the analysis they will need to have past bills handy.
  - Consider functionality for all users that grabs user-billing data from PG&E database (as was done for pilot users) so users do not have to keep track. (Note: This may also entice users to return to the site in the future, and to register.) Users given Pilot login Ids liked having their data pulled into the California Energy Connection Web site, those who were not given Pilot Ids stated that this would be a useful function.

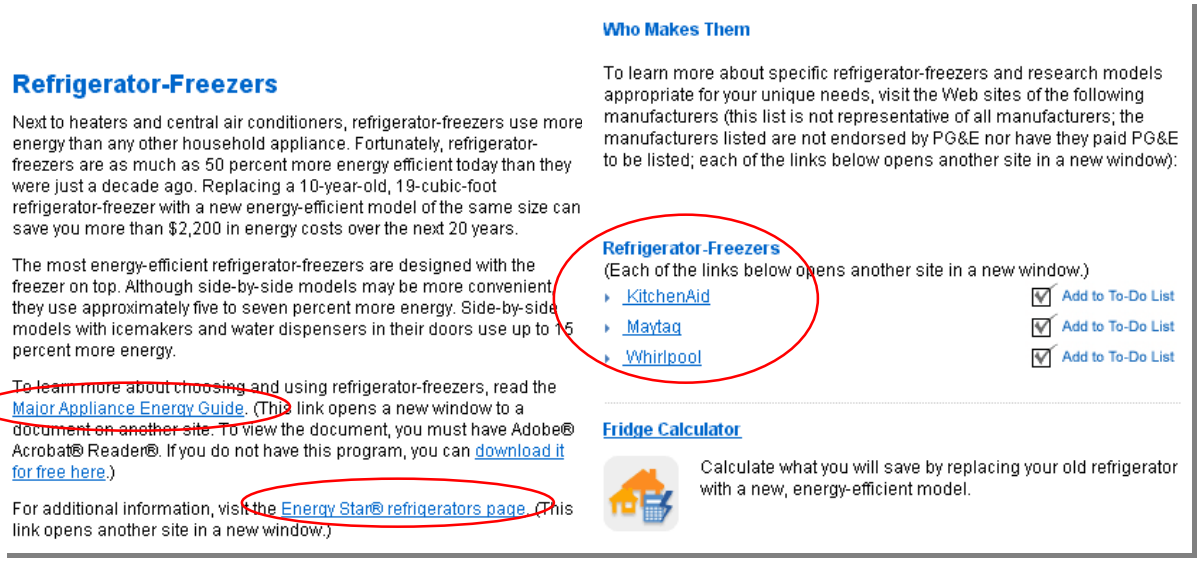
- Content
  - Add a link from the Usage History results to the Home Energy Analysis or Business Energy Analysis tools. This would help users understand that the site has additional functionality for providing specific recommendations.

Task: Locate Calculators (Residential only)

Residential respondents were asked to use the site to determine how much energy their refrigerator is using.

- Nearly all respondents began the task by going to the *Energy Saving Products* area. This behavior was similar to that seen in Wave 1. Due to this finding, links to the calculators had been added to the products area.

- In the *Energy Saving Products* area, users quickly found the *Refrigerator*s section. In this section they typically looked to the embedded links on the text. Links respondents tried included: **Major Appliance Energy Guide**, **Energy Star refrigerators**, and **links to specific manufacturer Web sites**. Many respondents did not look to the bottom of the page and find the calculator unless prompted to find "another place on this page for this information." Mainly, this feature was well below the page-fold, thereby respondents first tried visible links (above) that looked like they were related to the task.

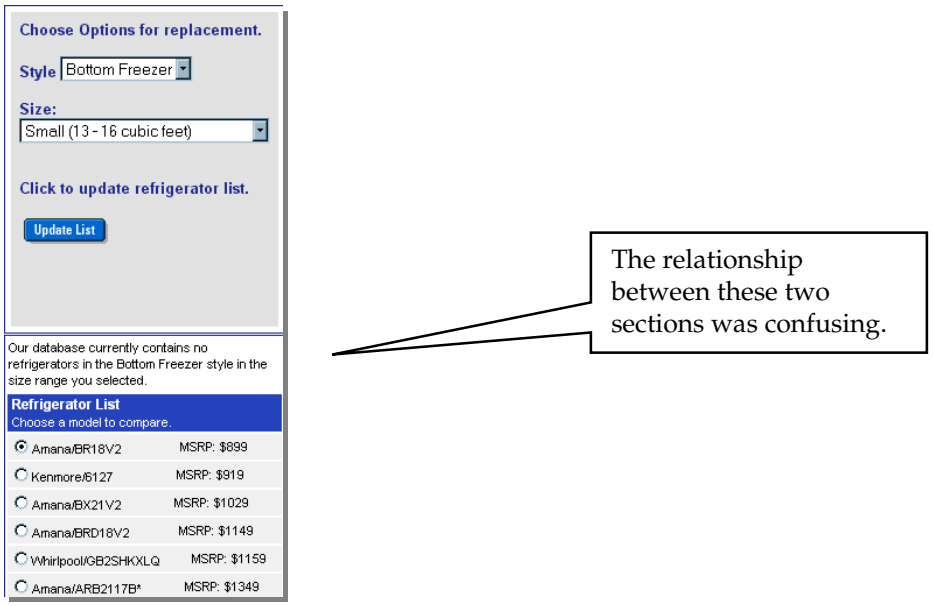


- Nearly all respondents were able to input data in to the calculator. One or two were not sure if the first set of questions asked for the information about their current refrigerator or the desired refrigerator, even with the Age question.

"Is this asking me to put in information about the refrigerator I want, or the one I have?"

After seeing calculator results: "I'm going to go back a page and enter in different information to see how other types of refrigerators compare."

- On the results page for the Fridge Calc, users had a few concerns:
  - Since some respondents entered information about the refrigerator they would like to have into the calculator, they were not sure how it could calculate their savings.
  - It was not understood by some that changing the Refrigerator List showed other options of refrigerators to compare to their current model. Also, one or two did not identify the Update List button with the list of recommended refrigerators.



- Because nearly all respondents visited the Products area looking for the refrigerator calculator, respondents were also asked about their impressions of having specific products listed on the site. Most mentioned that it was useful, and that these products are most likely the most energy efficient. Despite the fact that there is disclaimer language indicating no affiliation, one or two suggested that the manufacturers had a business relationship with California Energy Connection Web site and may have paid to have their products listed.

Locate Calculators Recommendations

- Information hierarchy
  - Since users liked the functionality of the calculators, consider bringing them up higher on the products page. Even at higher resolutions the calculator link/icon was below the page fold and respondents did not immediately find it.

- Content
  - Boldly state on the Fridge Calc that it is intended for the user to specify his/her current refrigerator.
  - Outline the relationship of the manufacturers with California Energy Connection Web site. Stress that the listed manufacturers have energy-efficient products, and are not in a business relationship with the Web site or PG&E.

My Homepage

Respondents given pilot registration information were taken to "My Homepage." My Homepage is a new area of the site and was not tested in Wave 1. This area of the site was developed as a result of recommendations made in Wave 1, in response to users wanting more information that applies specifically to themselves.

- When asked about the "My Homepage" button, respondents were not sure what it led to. One or two initially thought is was the California Energy Connection homepage; while others assumed it showed their personal information.

- Upon viewing My Homepage, respondents typically mentioned the *Usage History* and the rebate finder. These two elements, being at the top of the main content area, were in noticeable positions. Concerning the Rebate Finder, respondents were divided as to whether they thought that the rebates were shown specifically for them. After seeing the *Usage History* chart, one or two respondents questioned whether they would have to enter this information or if it would be linked to their PG&E account.

- Respondents on My Homepage were asked to move content on the page. Most respondents missed the "Change Content" links at the top of the page, but found them in the middle of the screen. One or two tried "My Profile," expecting to be able to modify content in this area. In the Change Content/Layout screen, most respondents were able to determine how to modify the My Homepage. A few respondents did not understand why they could not modify the top to elements on My Homepage: Rebate Finder and Usage History.

- While some respondents were able to determine what the California Electric System Status table was showing, most felt that the information was low-priority.

"I wouldn't come to this site to look up the system status, I don't even know what the units are."

My Homepage Recommendations

- Content/Organization
  - Consider moving the Bill Analyzer up to the top of the page with the Rebate Finder and Usage History. Of all the functionality, these three were perceived as being the most valuable.

- Remove the Change Layout/Choose Content links. While users were able to find these links when prompted, most did not notice them upon initial exploration and did not find value in them.

Task: Bill Analyzer (Pilot Residential only)

To begin this task, respondents were told "your bill is higher this month than last and you want to find out why this is so."

- While respondents found the Bill Analyzer, a few started with the Analyze Usage link in the left side menu. Since respondents had started with the homepage, they were already familiar with this term. Also, the Bill Analyzer was lower on the page than the Usage History and Rebate modules.

- One or two respondents stated that the Bill Analyzer link *"should be above rebates, I'm more likely to use the analyzer."* These respondents felt that the rebates were less useful than the Bill Analyzer.

- Respondents were able to navigate through the Bill Analyzer, although many did not expect to *"answer so many questions."* Expectations about how long the Bill Analyzer would take to complete were not set before the tool was used. Another looked for shortcuts or a table-of-contents type of screen, *"what if I suspect that renovations were the culprit for my higher bill – how could I go right to that area of questions?"*

- The imagery and text was well received by respondents. Most reported that they liked the *"pictures"* and the different colors were useful. Users were able to identify the suggestions offered by the tool.

- One respondent suggested: *"change the blue text to green, green means 'go' and 'saving money'."*

- One respondent reported that a link to the Bill Analyzer should be found with the results from the Usage History chart page. This would provide a logical "next step" for users.

Bill Analyzer Recommendations

- Information hierarchy
  - Add a link to the Bill Analyzer from the results of the Usage History tool. Users usually visited the Usage History first, and also mentioned that it was logical to look at their usage patterns then move on to the Bill Analyzer.

- Information design
  - The Bill Analyzer tool should add functionality that allows users to a) know how long the whole audit takes, b) be able to see their progress through the audit tool, and c) be able to jump to a specific section (such as a table of contents or status bar).

- Content

– Inform users of the types of suggestions given by the Bill Analyzer. While users found value in the results, most were not sure what to expect while entering data.

Task: Business Energy Analysis (Pilot Business only)

Business pilot respondents were told, "Your business' utility bills have increased significantly…and you want to find out how much energy various pieces of equipment use."

- Like Residential respondents, some business respondents initially went to the **Analyze Your Usage >> Usage History** through the left side menu. These respondents did not notice Business Energy Analyzer link on the My Homepage. The Usage History element was noticeable as it was at the top of the page.
  - "This is a brochure, it's nice to see what's optimum or a comparison. I wouldn't read the tips…they give me a redo of the Usage History tips. I get lectured to anyway, I don't need this." Within the Business Energy Analyzer respondents expected more specific recommendations.

- One respondent who first visited the *Usage History* tool mentioned, *"this gives tips, I don't have to go to the Business Energy Analyzer to get recommendations."* This respondent determined that information in the Usage History tool would be similar to that given in the Business Energy Analyzer.

- While respondents liked that there were a number of options on the main page of the Business Energy Analyzer, only some understood how the specific results would be different.

"I assume that My Benchmark will compare my business to others and that the Detailed Analysis will be more specific to my business."

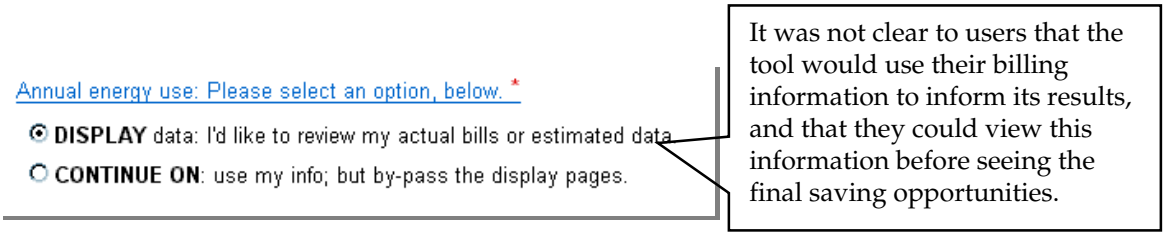
"I don't know exactly how the results will look, I'm not sure I'd have time to do this."

- Respondents in the Business Energy Analysis generally liked the level of detail in the Analyzer. It was noted, "this targets my small business, it's not generic like other data [Usage History]."

- However, entering data on the Fast Track form was difficult for a few respondents. Generally, respondents did not use the links to help (the question) for more information.
  - Facility type: "I have a building that's part warehouse and part office, what do I select?"
  - A few respondents were not sure if they had secondary heating sources, or what these might be.
  - Since the Opening Time/Closing Time drop-down menus must be scrolled to find the "Sorry – We're closed" option, a number of users did not see this selection.

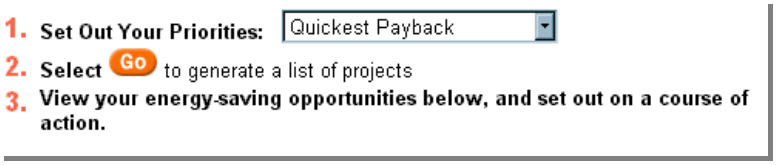
– One or two were confused at the Facility Name and ZIP Code. These respondents were not sure what types of information to enter in this field, or why they were necessary.

- One area that nearly all respondents were confused at was the Display data/Continue On questions at the end of the first page of the form. None of the respondents understood the distinction between the two items. Generally respondents selected the "Display" option expecting that it would show more information, although one respondent stated, *"I can't click Display because I don't have my bills, would it be able to retrieve my data?"* It was not clear to respondents that their billing data was being used for analysis and that they had the option to review this information.

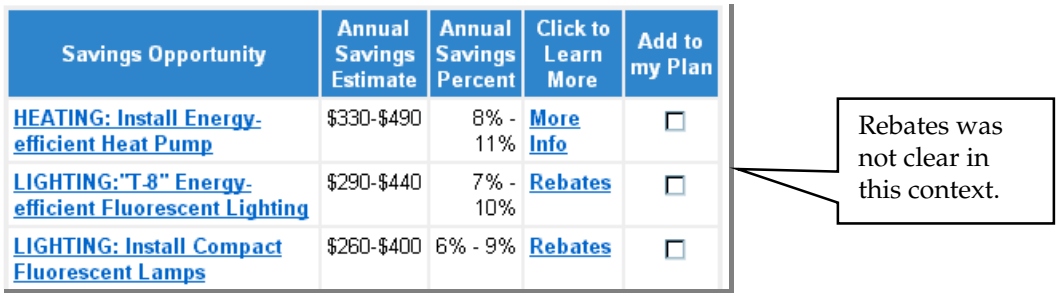


- One or two respondents had questions about the Bill History screen, *"Is this a 'What if'?"* Most, however, found the Next or Measures item and subsequent results.

- While respondents liked the layout of the suggestions in the Project Plan, some were confused at the "Set Out Your Priorities" selection. This being a way to sort the recommendations was not clear to these respondents. Also, the "plan" model was not understood by most, and respondents typically did not continue past this page (with the View My Plan link.) Because respondents did not use/change the Priorities drop-down, some missed viewing all the possible saving opportunities.



- Most users liked the layout of the energy-saving opportunities. The specifics of how much might be saved and how much each opportunity cost was valuable, "I've never seen this kind of detail, it's good." Users didn't understand the "Rebates" column.



- One or two respondents used the My Benchmark link in the Business Energy Analysis area. The details on the form led respondents to believe that "this is going to be helpful." The results of the benchmark were somewhat useful, "I'm surprised at how much interior lighting costs." It was also noted, "I'd like a link from the Interior Lighting slice of the pie chart to suggestions at how to lower this cost."

Business Energy Analysis (Pilot Business Only) Recommendations

- Content
  - Include examples of savings opportunities in the description of the Business Energy Analyzer to illustrate the benefits of using the tool.

- Tactical
  - Add a "what's this?" link below each of the questions in the form part of the tools that links to the pop-up help window. This extra call-out may aid users in understanding how to get definitions of the questions or terms in the form.
  - Default the Savings opportunities/Priorities to Show All, not Quickest Payback.
  - Include links from the My Benchmark charts to relevant savings opportunities.
  - Ensure that all options on drop-down menus are visible, unless the list is very long (e.g. Facility Type).

3.4.5 Overall Evaluation

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

Credibility

- Generally, respondents perceived the Web site as being credible, and most noticed the connection to PG&E. One or two mentioned that they have some distrust of PG&E, but most assumed that the California Energy Connection Web site was a good-faith effort at helping customers reduce energy costs. A few were concerned at the inclusion of specific products and manufacturers, expecting that some might have contributed money to get placement on the site. Many, however, assumed that the manufacturers were the ones with the most energy-efficient products.

- Compared to Wave 1, responses were more likely to reveal that users regarded PG&E as a trusted source. Respondents tended to expect PG&E to want to provide unbiased information on how to lower energy use, even though it is apparently "against their interests." Knowing that a government agency (i.e. CPUC) was involved seemed to raise expectations of the site being unbiased, except for one or two users.

Overall Attitudes Towards California Energy Connection Web Site

- Concerning the colors and style, respondents were typically positive. The site was mentioned as having a "simple" style and being easy-to-read. A few respondents noted

that there was "a lot of text." Respondents appreciated having access to a significant amount of information, but at times lengthy text blocks were skipped over by respondents.

- While residential respondents felt that the site had value, most assumed that homeowners would get the most use out of it. Business respondents echoed the same attitudes, and also noted that being small business people precluded them from spending much time entering in data, especially if the specificity of the results was unknown.

- Agreeing with statements made in Wave 1, respondents said that they would not use this site to find energy news. Instead, respondents would use other sites, particularly news-related sources. One or two, however, initially hoped that this site would provide information on how electricity was created and distributed, especially by PG&E.

- Respondents in Wave 2 were more likely to view the *10 Simple Tips* as being "too generic." Business customers were the most vocal about the importance of specific, personalized suggestions on how to lower energy costs (such as in the Business Energy Analyzer). This information indicated that users are more likely to return to the site if it is personalized with their usage info and provides specific recommendations on how to lower costs.

Overall Recommendations

- Marketing and Awareness
  - Focus efforts on including interactive and customizable tools on the site that incent users to return. Also illustrate examples of savings opportunities.
  - Highlight areas where user-billing info is automatically imported and how using the tools can help save on energy costs. Include information that highlights that the results of analysis tools are based on the users' actual usage data and that the results will be saved and can be accessed at any time.

3.5 SUMMARY OF FINDINGS

3.5.1 Users Generally Found Value in the Web site

- Users generally found value in the Web site, particularly the saving options in the audit tools and the products.

- Most respondents believed the California Energy Connection Web site to be a useful resource, and commented that they would be likely to visit the site in the future. Respondents' intention to return is consistent with surveyed users, 90% of whom also claimed they would return to the site.

- The energy calculators were considered a valuable part of the Web site, although users had difficulty locating them. This is similar finding to Wave 1, even though additional links to the calculators had been added to the products area.

- Users gave market information a mixed review.
  - Business respondents tended to ignore this area and concentrate on what directly affected their business' energy use. Residential respondents were more interested in market information, and in understanding how the electricity system operates.
  - Some respondents were able to determine what the California Electric System Status table was showing, most felt that the information was low-priority. "I wouldn't come to this site to look up the system status, I don't even know what the units are."

3.5.2 Users Like Specific Recommendations on Their Energy Use

- Most respondents liked the level of detail in the Business and Home Energy Analysis, the specifics of how much can be saved and how much each opportunity cost was valuable.
  - The areas that had information that was too general included the *10 Simple Tips* and the *Usage History* tool.

3.5.3 Users Were Confused About Differences in the Interactive Tools

- Users were unsure which particular tool to use (Energy Analysis, Fast Track, Bill Analyzer, and Usage History). Respondents were sometimes unclear of the differences between FastTrack, Energy Analysis (home and business), and My Benchmark.

- Many users were unable to clearly differentiate between FastTrack and Home Energy Analysis.

3.5.4 Many Users Were Uncertain About the Value of the Tools or the Time Needed to Use Them

- Respondents were able to navigate through the Bill Analyzer, although many did not expect to *"answer so many questions."* Expectations about how long the Bill Analyzer would take to complete were not set before the tool was used.

- Once in the *Business Energy Analysis*, respondents were able to fill out the data to find specific recommendations. However, most respondents were not sure how long the process would last.

3.5.5 Some Users Were Unwilling to Spend Much Time with Interactive Tools

- Generally, respondents who finished the Business Energy analyzer stated that there were *"too many questions, I don't have time for this."* Only one respondent found value in completing all the analyzer questions.

- Business users noted that they might be less likely to return to the site, citing time concerns.

- Respondents who visited Usage History stated that they would not take the time to manually enter all their billing information. One or two mentioned that they keep their

records separate from their computer, and it would be "too much work" to retrieve the bills and enter in the information. Respondents also were not sure that the effort of inputting the data would be worth the benefit of seeing a chart.

  - A few assumed that their own electricity use would be accessible on this Web site

3.5.6 Users Consider the Web Site to be Credible and View PG&E as a Trusted Information Source

- Most respondents noticed the connection to PG&E and a few wondered why "this site isn't part of PG&E."

- Respondents generally perceived the Web site as credible.
  - Most assumed that the California Energy Connection Web site was a good-faith effort at helping customers reduce energy costs.

- Respondents had a positive perception of PG&E and regarded PG&E as a trusted source, more so than in Wave 1.
  - Respondents tended to expect PG&E to want to provide unbiased information on how to lower energy use, even though it is apparently "against their interests."
  - Knowing that a government agency (i.e. CPUC) was involved seemed to raise expectations that the site was unbiased.

3.5.7 Cross-Market the Web Site with PGE.com

- Since respondents' online experience with energy-related matters was typically limited to visits to PG&E's Web Site for billing/account details, California Energy Connection should cross-marketed with PGE.com and other printed PG&E materials.

- Choose a more intuitive URL

3.5.8 Convince Customers that the Tools are Worth Their Time

- Adding a "What you get" feature that shows potential results may motivate users to use the audits.
  - For Business Energy Analysis users, add a "what's this?" link below each of the questions in the form part of the tools that links to the pop-up help window. This extra call-out may aid users in understanding how to get definitions of the questions or terms in the form.
  - Inform users of the types of suggestions given by the Bill Analyzer. While users found value in the results, most were not sure what to expect while entering data.

3.5.9 Manage Customer Expectations Better

- Users needed to know in advance what information they would need to complete the forms.

- Inform users upfront that in order to complete the analysis they will need to have past bills handy.

- Present users with more information about the results of the Analyzers *before* they are asked questions. This will address users concerns about the Business Energy Analysis, such as: "I don't know exactly how the results will look, I'm not sure I'd have time to do this."

- 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; users who were presented with pre-filled data liked this feature)
  - Highlight areas where user-billing info is automatically imported and how using the tools can help save on energy costs.

3.5.10 Revisit Registration

- 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. On the intermediary page between the link to a tool and the login page, highlight that registration is only to save (or import) usage data. While this text is present, many users did not read it.
  - 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. To understand the full extent to which users perceive privacy, further quantitative research is needed.

4. WEB SURVEY

4.1 BACKGROUND

An online survey of California Energy Connection Web site users and non-users was conducted in order to further improve the Web site. Survey results offered in this chapter help us to

- Understand user reaction to various pats of the Web site
- Determine how often and which areas of the Web site users visited
- Evaluate changes to the Web site
- Measure the influence of the site in the adoption of energy efficiency measures
- Understand the level of awareness of the California Energy Connection Web site among non-users
- Gain insight into the level of interest in web sites devoted to energy efficiency

The survey instrument is presented in Appendix A.

4.1.1 Sample Design and Data Collection

Sample was selected from Socratic Technologies Forum and partnership panels, pre-recruited panels of online users that are representative of the online population as a whole. PG&E also provided sample of known Web site users. Because the target audience was web users, Socratic Web survey online research technology was used in this study.

Data collection began on December 11, 2003 and was completed on January 2, 2004. California Energy Connection Web site users who completed the entire questionnaire received a $10 Amazon.com gift certificate. Non-users received $3.

A total of 478 respondents participated in this study, including 177 users and 301 non-users. Users are individuals that have registered with the site. Non-users are customers that did not visit the site.

Exhibit 4-1
Respondent Sample

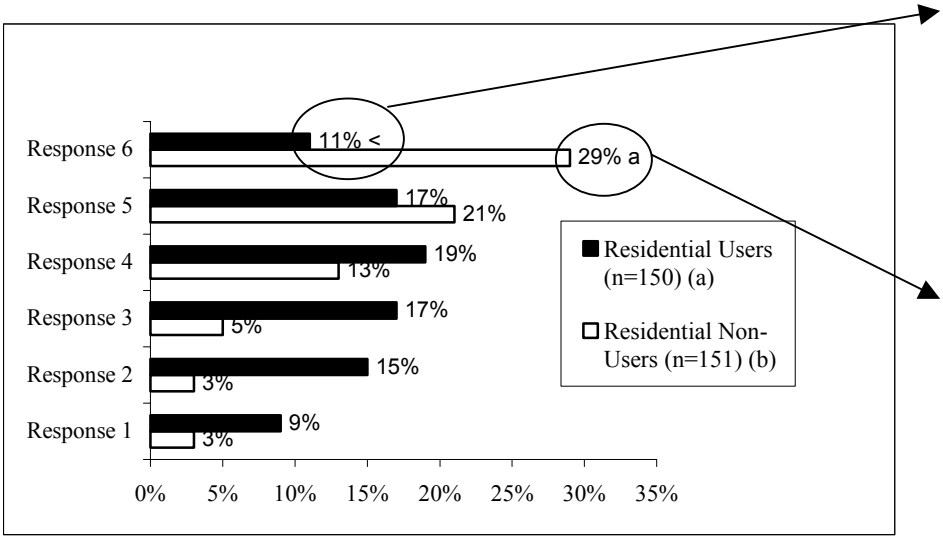
	Residential	Commercial	Total
Users	150	27	177
Non-users	151	150	301
Total	301	177	478

4.1.2 Explanation of Exhibits

In the exhibits that follow, comparisons of values were drawn between this year's evaluation (Wave 1) and the previous year's evaluation (Wave 2) to see if statistically significant changes occurred. To illustrate statistically significant differences between Wave 2 and Wave 1 findings at the 95% confidence level, the exhibits have notations showing "<" or ">", where "<" (less than) indicates Wave 2 findings are less than Wave 1 and ">" (greater than) means Wave 2 findings are greater than Wave 1 findings.

Similarly, comparisons within Wave 2 were made between different segments, such as users versus non-users, one-time visitors versus return visitors. These are indicated with letters corresponding to the segments being compared.

The example below illustrates statistical differences.



"<" indicates that for these respective sample sizes, 11% (Residential Users) is significantly less than the same result for response 6 in Wave 1 at the 95% Confidence Level

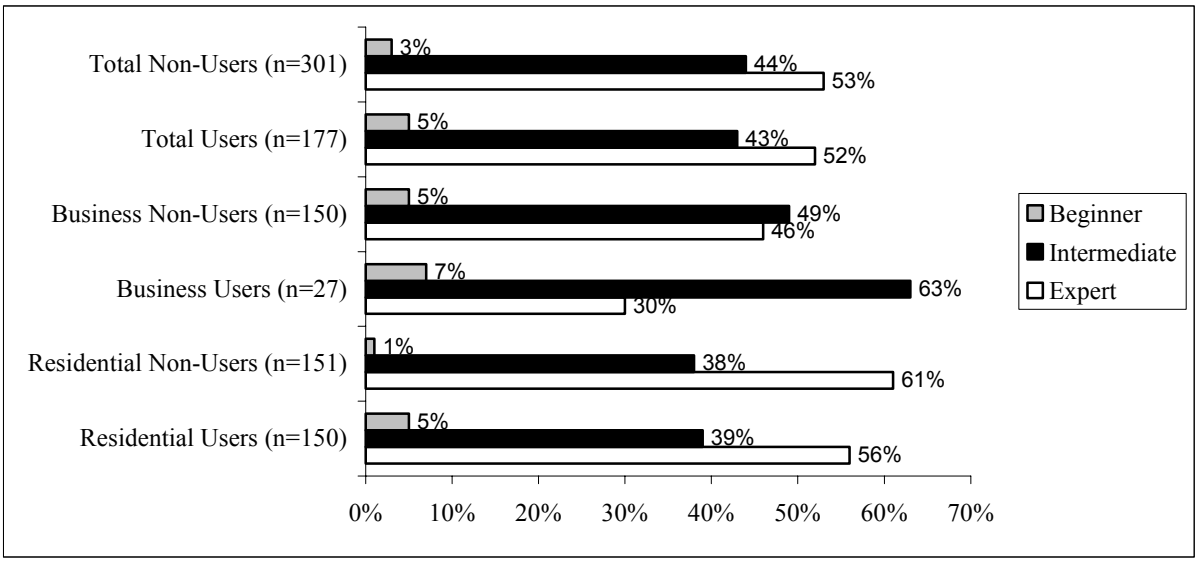
"a" indicates that for these respective sample sizes, 29% (Residential Non Users) is greater than 11% (Residential Users) at the 95% Confidence Level

4.2 DEMOGRAPHICS

4.2.1 Internet/WEB Usage

Users and Non Users of California Energy Connection Web site are very similar in terms of their Web expertise. Approximately half of each User group consider themselves to be "Web Experts" (53% of Users and 52% of Non Users). Business Non Users are more inclined to describe themselves as "intermediate Web users" than are Residential Non Users. However, Residential Non Users are increasingly "Web Experts" when compared to the previous wave.

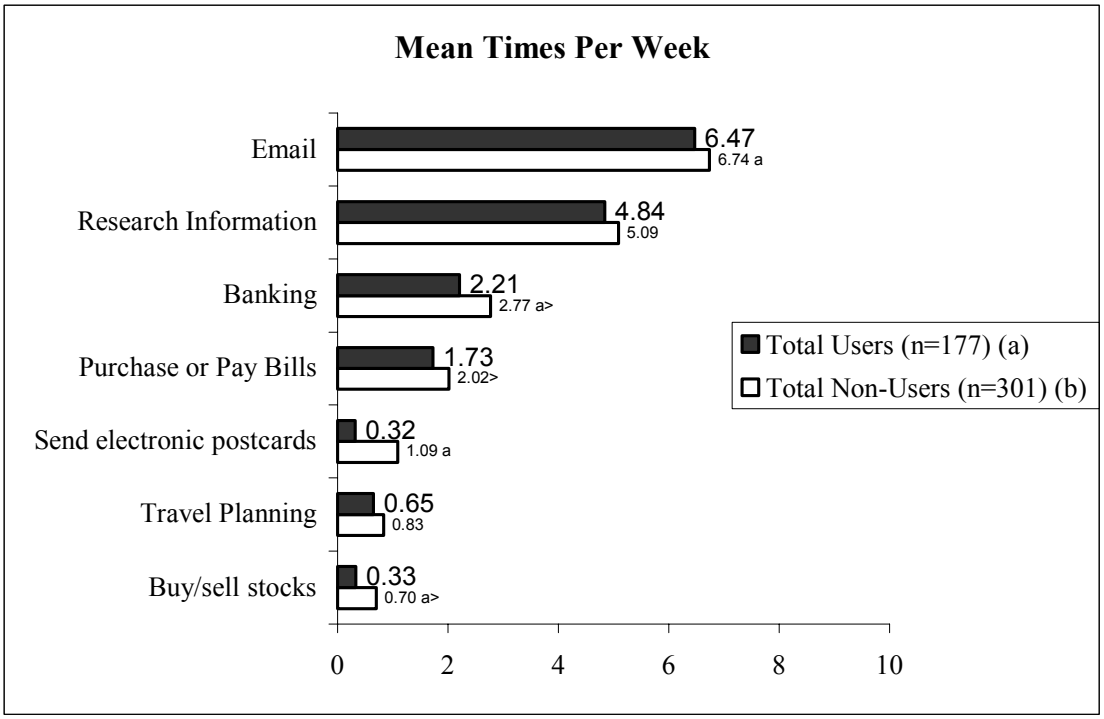
Exhibit 4-2
Level of Expertise When Using the Internet or Web



4.2.2 Online Activities

By far, email is the most pervasive Internet activity conducted on a weekly basis for both Users and Non Users of California Energy Connection Web site. In addition, both groups are equally inclined to use the Internet/Web to conduct online research, purchase items or pay bills, make travel plans and buy or sell stock. Interestingly, Non Users of California Energy Connection Web site are more inclined to use email, online banking and send electronic postcards than are California Energy Connection Web site Users. In addition, while Users are unchanged from the previous wave, Non Users are increasingly using online baking and using the Internet/Web to make purchases and pay bills.

Exhibit 4-3
Online Activities



4.2.3 Age

Overall, Users of California Energy Connection Web site are older than are Non Users. The approximated average age of Users is 47 while the Non Users average 42 years. Generally, most users are between 35 and 44 years of age. Residential Non Users definitely skew younger with nearly two-fifths with ages between 18 and 24 years. Users in this wave of research are older than those participating in last year's research.

Exhibit 4-4
Age

	Mean Age	Under 18	18-24	25-34	35-44	45-54	55-65	Over 65
Residential Users (n=150)	**48**	0%	1%	5%	29%	41%	17%	4%
Residential Non-Users (n=151)	**39**	1%	5%	38%	26%	23%	5%	3%
Business Users (n=27)	**46**	0%	11%	4%	22%	37%	26%	0%
Business Non-Users (n=150)	**44**	0%	1%	18%	31%	31%	14%	3%
Total Users (n=177)	**47**	0%	2%	5%	28%	40%	18%	3%
Total Non-Users (n=301)	**42**	*	3%	28%	28%	27%	10%	3%

4.2.4 Educational Background

At least two-fifths of respondents indicate having graduated college. However, as with last wave's findings, Users tend toward higher education levels.

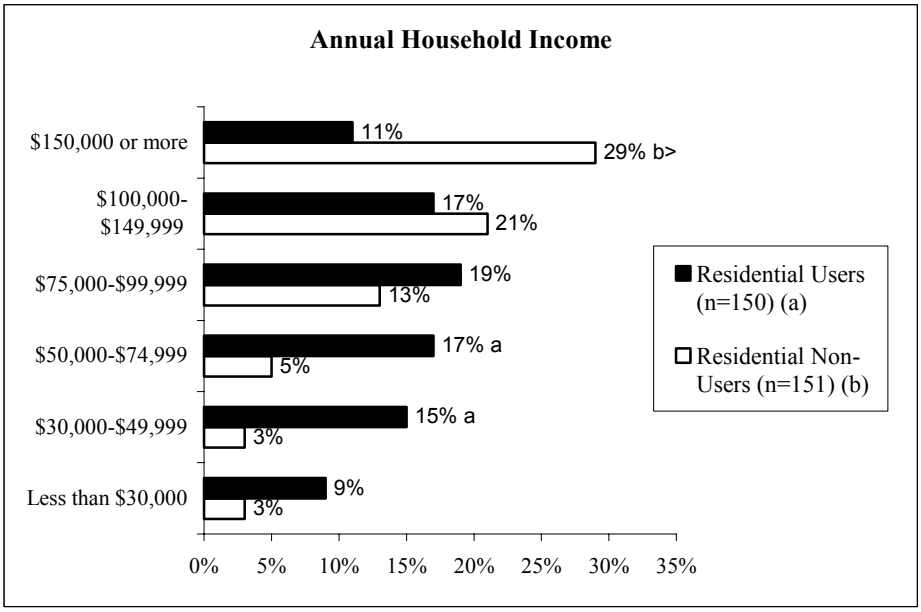
Exhibit 4-5
Education

	Graduated High School	Trade or Technical School	Some College	Graduated College	Graduate School
Residential Users (n=150)	3%	0%	13%	41%	41%
Residential Non-Users (n=151)	9%	4%	22%	44%	19%
Business Users (n=27)	0%	4%	33%	41%	22%
Business Non-Users (n=150)	5%	4%	29%	42%	19%
Total Users (n=177)	2%	1%	16%	41%	38%
Total Non-Users (n=301)	7%	4%	26%	43%	19%

4.2.5 Residential User Profile

While the average household income among Non Users is significantly higher this wave than last ($84,000 current wave vs. $65,000 previously), it continues to lag significantly behind that of Users ($84,000 for Non User households vs. $120,000 for User households). This is a significant increase in household income when compared to the previous wave of research. Non Users are more inclined to report household income levels below $75,000.

Exhibit 4-6
Annual Household Income



Nearly all of California Energy Connection Web site Users reside in single family homes (93%). While slightly more than two-thirds (69%) of Non Users reside in single family homes. More than two out of ten Non Users indicate residing in an apartment or condo (either with more or less than 4 units). These data are consistent with the previous wave's finding.

Exhibit 4-7
Description of Home

	Residential Users (n=150) (a)	Residential Non-Users (n=151) (b)
Single Family Home	93% b	69%
Apartment or condo in building with 4 or fewer units	1%	11% a
Apartment or condo in building with more than 4 units	2%	13% a
Townhome	1%	5%
Trailer/mobile home	1%	2%
Other	1%	0%

4.3. SOURCES OF AWARENESS AND SPONSORSHIP

Consistent with last year's research, more than one-third of all Users indicate being made aware of California Energy Connection Web site via a notice other than their electric bill received in the mail. Again, Business Users are more inclined to report this than are Residential Users. Residential Users are more likely to have been made aware of California Energy Connection Web site via their utility bill than are Business Users.

Exhibit 4-8
Sources of Awareness

Sources of Awareness	Residential Users (n=150) (a)	Business Users (n=27) (b)	Total Users (177)
Received Notice in Mail	33%	59% a	37%
Printed on Utility Bill*	17% b	4%	15%
PGE.com	12%	7%	11%
A Print Advertisement	7%	7%	7%
A Friend, Colleague or Family Member Recommendation	2%	0%	2%
Internet Search Engine	2%	0%	2%
A Link or Banner Ad on Another Website	1%	0%	1%
Other	5%	7%	5%
I'm Not Sure/Don't Remember	21%	15%	20%

*Note: California Energy Connection marketing materials were never printed in PG&E utility bills.

Awareness of PG&E as the sponsor of the California Energy Connection Web site has increased significantly since 2002, 64% currently vs. 42% last wave. This increase in sponsorship awareness is driven entirely by Residential Users. While the sponsorship communication has clearly improved, nearly one-quarter of Users continue to believe that the State of California is the Web site sponsor.

Exhibit 4-9
Sponsorship Awareness

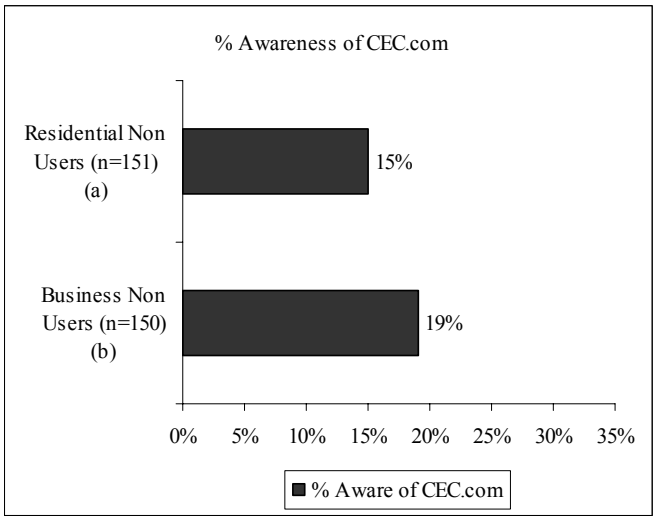
Sponsorship Awareness	Residential Users (n=150) (a)		Business Users (n=27) (b)	Total Users (177)	
Pacific Gas & Electric	67%	b >	44%	64%	>
California Public Utility Commission	22%		37%	24%	
The State of California	5%		11%	6%	
A consumer watchdog group	3%		0%	2%	
A for-profit energy services company	1%		4%	2%	
Southern California Edison	1%		4%	1%	
Someone else	1%		0%	1%	

4.4 NON-USERS

4.4.1 Website Awareness

Awareness of California Energy Connection Web site among Non Users is quite low. Residential and Commercial Non Users are equally likely to be aware of the California Energy Connection Web site.

Exhibit 4-10
Non-User Awareness of California Energy Connection Web Site



4.4.2 Energy Efficiency Attitudes

Overall, those Non Users who report being aware of the California Energy Connection Web site appear to be more attuned to energy efficiency issues and concerns. Specifically, those aware of the site feel they are "well informed about how to save energy", "aware of information about energy efficient products offered" feel that "credible information about energy is easy to find" and feel that the "media has effected their energy conservation" than are those who report being unaware of the Web site. Compared to the previous wave, those aware also feel the "media coverage… made them use energy more carefully" has increased significantly. In addition, those unaware of the California Energy Connection Web site agree less with the statement "I am aware of information about energy efficient products offered" than last year.

Exhibit 4-11
Energy Efficiency Attitudes Among Those Aware and Unaware of California Energy Connection Web Site

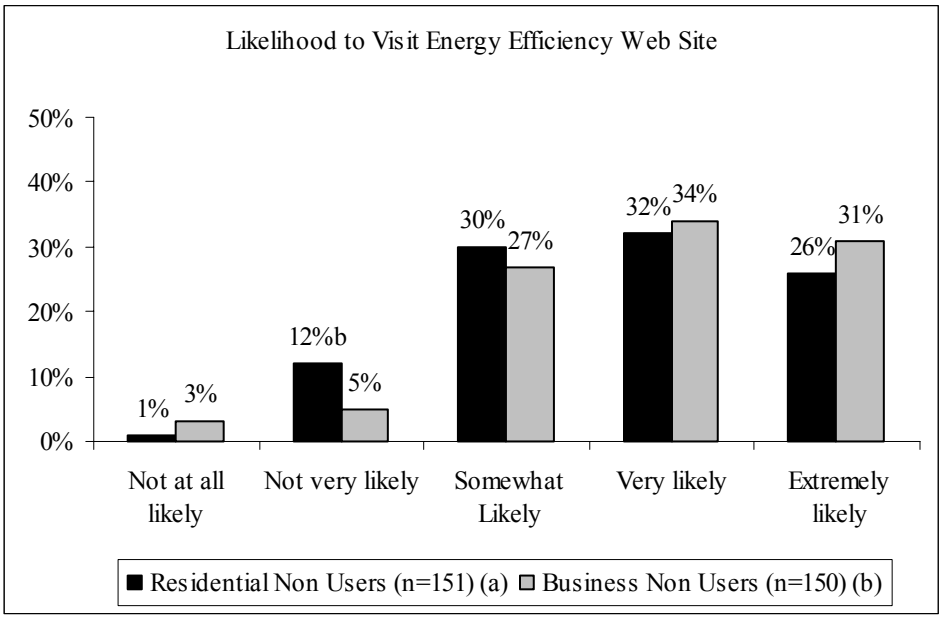
Mean agreement on a 5-point scale.

Mean Agreement on 5-point agreement scale	Non Users Aware of Site (n=51) (a)		Non Users Unaware of Site (n=250) (b)	
I am aware of information about energy efficient products offered by manufacturers	4.27	b	3.83	<
I am well-informed about how to save energy in my home/business	4.14	b	3.88	
PG&E is a useful source of energy efficiency information	4.02		3.83	
I've known all this conservation stuff for a long time	4.02		3.76	
Media coverage of the energy crisis made me use energy more carefully	4.02	b >	3.67	
Credible information about energy is easy to find	3.98	b	3.68	
All this conservation stuff is common sense	3.82		3.75	

4.4.3 Likelihood of Visiting Energy Efficiency Web Sites

More than one-quarter of both Residential and Business Non Users report being "extremely likely" to visit energy efficiency Web sites. In addition, around one-third of Non Users indicate being very likely to visit a Web site of this type in the future. Virtually none of the Non Users indicate full rejection of the idea of Web sites dedicated to energy efficiency.

Exhibit 4-12
Likelihood of Visiting An Energy Efficiency Web Site



4.4.4 Customer Attitudes on Energy Efficiency

Overall, there are few discernable differences in attitudes towards energy efficiency between those likely or unlikely to visit energy efficiency Web sites. The one difference is the pro PG&E statement "PG&E is a useful source of energy efficiency information". Those likely to use an energy efficiency Web site are more inclined to agree with this statement than are their counterparts.

Exhibit 4-13
Energy Efficiency Attitudes Among Non-users That are and are Not Likely to Use the California Energy Connection Web Site

Mean agreement on a 5-point scale.

Mean Agreement on 5-point agreement scale	Non Users Likely to use (n=270) (a)	Non Users Unlikely to use (n=31) (b)
PG&E is a useful source of energy efficiency information	3.91 b	3.39
I am well-informed about how to save energy in my home/business	3.91	4.00
I am aware of information about energy efficient products offered by manufacturers	3.90	3.97
I've known all this conservation stuff for a long time	3.81	3.71
All this conservation stuff is common sense	3.75	3.87
Media coverage of the energy crisis made me use energy more carefully	3.79	3.26
Credible information about energy is easy to find	3.75	3.61

4.4.5 Sources of Energy Efficiency Information

Consistently, online searches, specifically the Google engine and Yahoo! engine, are mentioned most frequently as the method used to gather information about energy efficiency among both Residential and Business Non Users. The PG&E Web site is the next most frequently mentioned source with around one-quarter mentioning it.

Exhibit 4-14
Sources of Energy Information

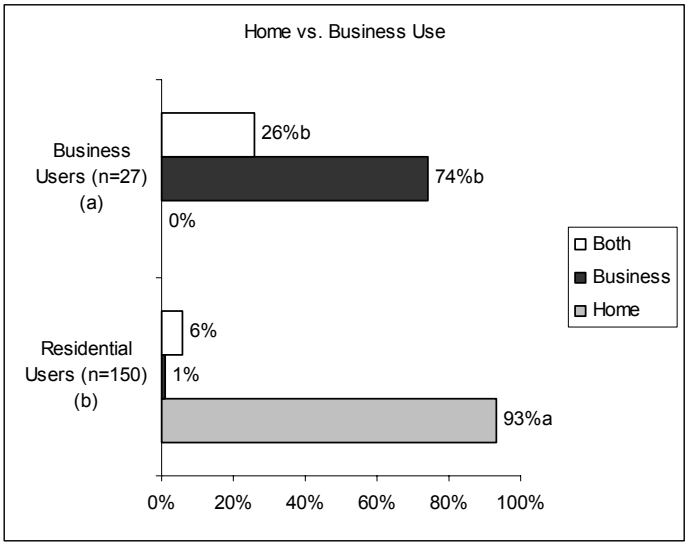
Sources of Information	Residential Non Users (n=144) (a)	Business Non Users (n=145) (b)	Total Non Users (n=289)
Online/Internet/Google/Yahoo	56%	51%	54%
PG&E Website	24%	23%	24%
PG&E (Non specific)	15%	18%	17%
California Energy Connection Web site	3%	3%	3%
Utility bill/stuffers/flyers included with my bill	1%	5%	3%

4.4.6 User Experience

Home vs. Business Use

Nearly all Residential Users came to the California Energy Connection Web site seeking information on home use (93%). Among Business Users, the vast majority (74%) were seeking information on business use. The remaining one-quarter (26%) were accessing efficiency information for their homes as well as their businesses.

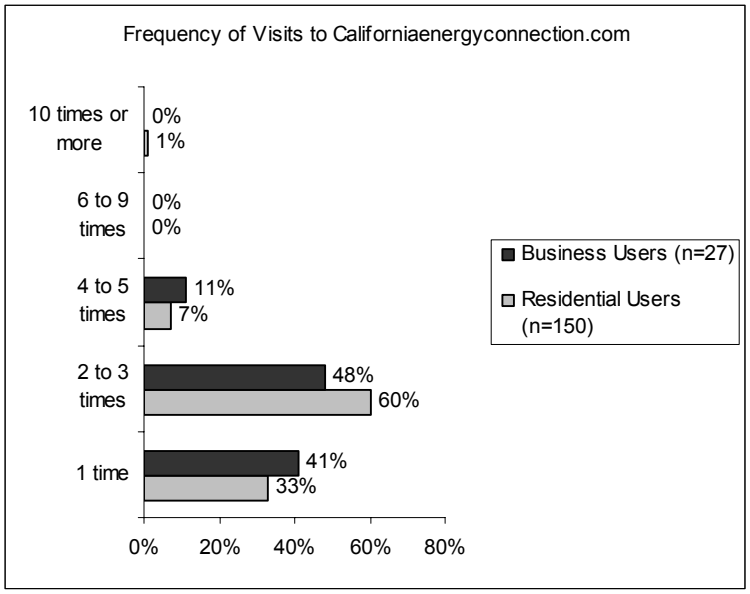
Exhibit 4-15
Home vs. Business Use



Frequency of Visits To California Energy Connection Web Site

On average, Users visited the California Energy Connection Web site twice in total. At least one-third of each User type indicate only visiting the California Energy Connection Web site once. There are no statistical differences in visitation frequency between the two User types. However, Business Users do indicate higher frequency of visitation, directionally speaking.

Exhibit 4-16
Frequency of Visits to California Energy Connection Web Site



Reasons For Visiting California Energy Connection Web Site

More than half of Users of California Energy Connection Web site (53%) visited the site to get information on energy saving. This is an especially strong reason among Business Users with more than two-thirds mentioning it (70%). In addition, rebate opportunity information was also reported as a key reason for visiting the Web site.

Exhibit 4-17
Reasons for Visit

Reasons for Visits vs. Most Important Reason	Reasons			Most Important Reason		
	Residential Users (n=150) (a)	Business Users (n=27) (b)	Total Users (n=177)	Residential Users (n=150) (a)	Business Users (n=27) (b)	Total Users (n=177)
Received a free gift from Amazon.com	57%	74%	59%	27%	19%	26%
Get tips on energy saving	49%	70% a	53%	15%	41% a	19%
Look for rebate opportunities	52%	37%	50%	14%	11%	14%
Learn about energy-saving products	40%	48%	41%	6%	4%	6%
Look at my energy usage history	38%	48%	40%	11%	15%	11%
Get an energy analysis	27%	30%	27%	6%	0%	5%
Use energy calculators to see the costs of various appliances	28% b	11%	25%	7%	0%	6%
Find out about renewable energy sources	19%	11%	18%	5%	7%	5%
See current news about energy	19%	7%	17%	3%	0%	2%
Use the Bill Analyzer to find out why my energy bill may have changed	9%	15%	10%	1%	0%	1%
Get information about the California energy market	9%	11%	9%	3%	0%	2%
Other	3%	4%	3%	2%	4%	2%

4.4.7 Visibility of Unvisited Areas of California Energy Connection Web Site

Energy saving tips, education about saving energy and rebate opportunities remain the most utilized sections of the California Energy Connection Web site, however, usage has declined from levels observed in the previous wave. Nearly half of all Users indicate not noticing the "My Home Page" section of the California Energy Connection Web site. Just less than one-third (29%) also indicate not observing the "Bill Analyzer" or "information about the California energy market" Web site features. Interestingly the two newest additions to the Web site, "My Home Page" and the "Bill Analyzer" are the only two areas visited with an attractiveness ratio less than one (the ratio of the percent that used the area divided by the percent that noticed but did not use the area.)

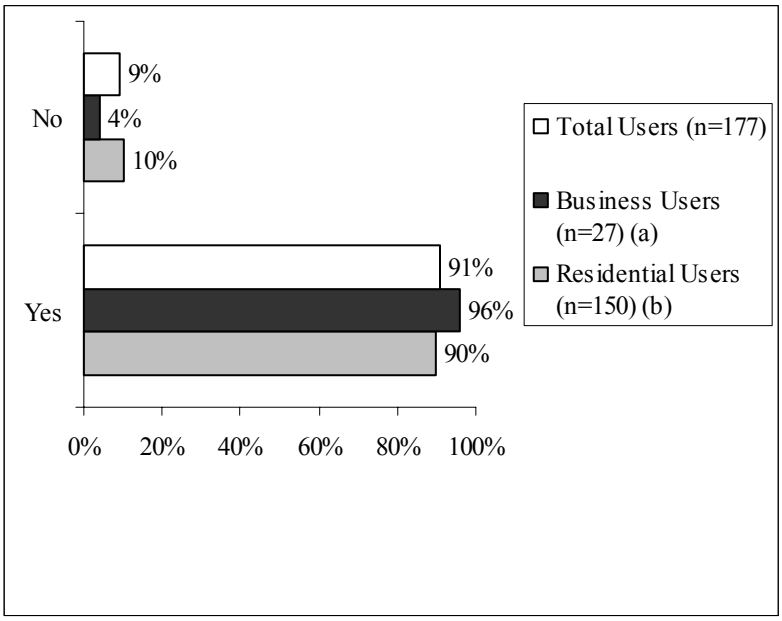
Exhibit 4-18
Most Used Areas and Visibility of Unvisited Areas
of California Energy Connection Web Site

Summary of Areas Visited on California Energy Connection Web site	Used (n=177)		Noticed But Did Not Use (n=177)	Did Not Notice (n=177)	Attractive-ness Ratio@
Get tips on energy savings	75%	<	10%	15%	7.8
Learn about energy savings	68%	<	14%	18%	4.8
Look for rebate opportunities	63%	<	18%	19%	3.6
See current news about energy	50%	<	25%	25%	2.0
Look at my energy usage history	48%	<	26%	26%	1.8
Use energy calculators to see the costs of various appliances	44%	<	28%	28%	1.6
Find out about renewable energy sources	44%	<	24%	32%	1.9
Get an energy analysis and customer savings recommendations	40%	<	34%	26%	1.2
Get information about the California energy market	38%	<	26%	36%	1.5
Use the Bill Analyzer to find out why my energy bill may have changed	29%		34%	37%	0.8
Use "My Home Page" to customize my Web site account	11%		36%	53%	0.3

4.4.8 Intention to Return to California Energy Connection Web Site

The preponderance of California Energy Connection Web site Users, both Residential and Business, indicate they intend to visit the site again in the future (90% Residential and 96% Business).

Exhibit 4-19
Intention to Return to California Energy Connection Web Site



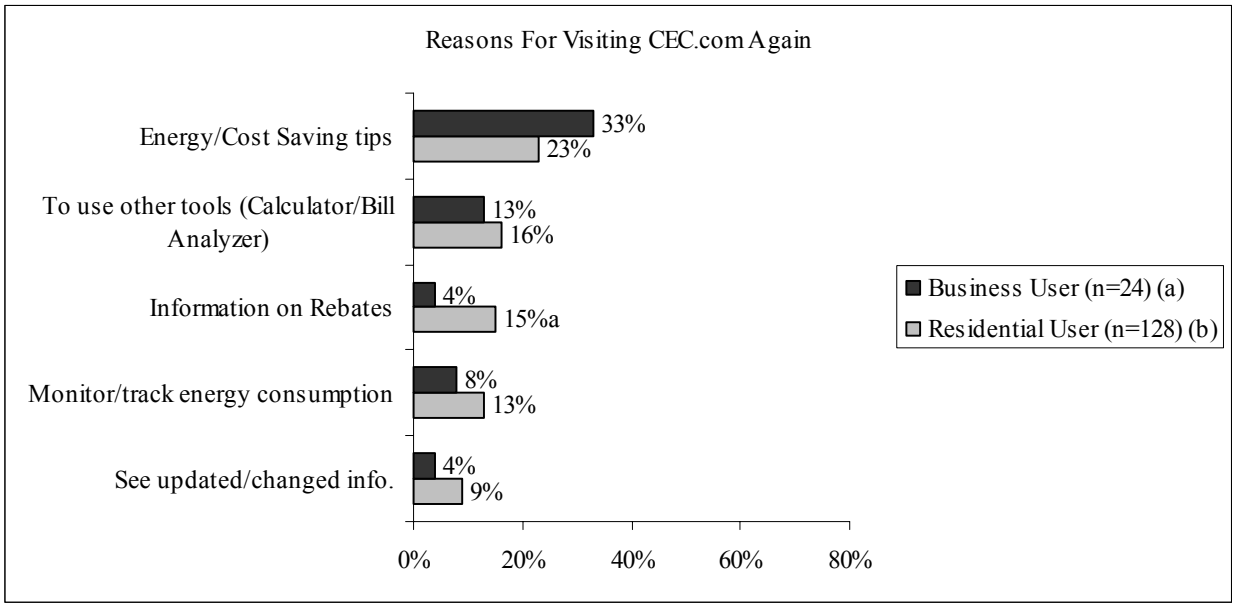
The most attractive aspects of the California Energy Connection Web site in terms of intended future use include rebate opportunities, energy saving tips and Usage history.

Exhibit 4-20
Areas of California Energy Connection Web Site Intended for Future Visits by Users

Areas of Califoniaenergyconnection.com intended for Future Visits by Users	Residential Users (n=135) (a)		Business Users (n=26) (b)		Total Users (n=161)
Look for rebate opportunities	81%		73%	<	80%
Get tips on energy savings	68%		73%		69%
Look at my energy usage history	70%		62%		69%
Learn about energy saving products	64%		73%	>	65%
Use energy calculators to see the costs of various appliances	62%	b	38%		58%
Get an energy analysis	56%		54%		55%
Use the Bill Analyzer to find out why my energy bill may be changed	47%		35%		45%
See current news about energy	31%		35%		32%
Fin out about renewable energy sources	31%		35%		32%
Get information about the California energy market	25%		23%		25%
Use "My Home Page" to customize my Web site account	13%		12%		12%
Not sure	4%		4%		4%

Predictably, access to energy saving tips is the most prevalent reason for both Residential and Business User future Web site use. Interestingly, though use of other tools like the Calculator and Bill Analyzer were quite low, these tools are key reasons for future use. It is important to point out that these tools were not highly noticed when the Web site was being utilized. The most logical explanation for these reasons being stated is that the survey instrument introduced respondent to these tools.

Exhibit 4-21
Reasons for Intended Return to California Energy Connection Web Site



4.5 USABILITY

4.5.1 Ease of Use

Users of the California Energy Connection Web site evaluate the site as being easy to use with average ratings around 4 where a 5 meant "Extremely easy" to use. The Web site's two new features, "My Home Page" and "Bill Analyzer," surface as the least easy to use with mean ratings around 3.

Exhibit 4-22
Ease of Use for California Energy Connection Web Site Features

Mean rating on a 5-point scale where 5 means "very easy."

Mean Rating on a 5-Point Ease of Use Scale	Residential Users		Business Users		Total Users	
	Rating	Sample Size	Rating	Sample Size	Rating	Sample Size
Get tips on energy savings	3.99	112	4.00	19	3.99	131
Learn about energy-saving products	3.88	101	3.89	18	3.88	119
Look for rebate opportunities	3.85	93	4.00	15	3.87	108
See current news about energy	3.76	70	4.19	16	3.86	86
Use energy calculators to see the costs of various appliances	3.83	66	3.91	11	3.84	77
Look at my energy usage history	3.70	71	4.00	13	3.75	84
Get an energy analysis	3.75	59	3.58	12	3.72	71
Find out about renewable energy sources	3.67	67	4.14	7	3.72	74
Get information about the California energy market	3.73	52	3.69	13	3.72	65
Use "My Home Page" to customize my Web site account	3.43	14	3.80	5	3.53	19
Use the Bill Analyzer to find out why my energy bill may have changed	3.38	40	3.22	9	3.35	49

4.5.2 Opinions Regarding California Energy Connection Web Site

Both types of Users agree that the California Energy Connection Web site is appealing, credible, technologically sound (loads quickly) and is well laid out. Business Users are more inclined to feel the lay out of the Web site is well done this year than previously. As with last year, Users continue to rate the Web site soft on being helpful in getting them to manage their energy usage or being helpful in getting them to make decision regarding purchasing energy efficient equipment. Return visitors evaluate every aspect of the Web site more positively than do one-time visitors. It is impossible to assess whether a higher satisfaction with a one-time visit drove the second visit or if multiple visits drive evaluations higher. Importantly, return visitors do not evaluate the Web site higher on being helpful in getting them to make decisions regarding purchasing energy efficient equipment.

Exhibit 4-23
Opinions About California Energy Connection Web Site Features

Mean agreement on a 5-point scale where 5 means "strongly agree."

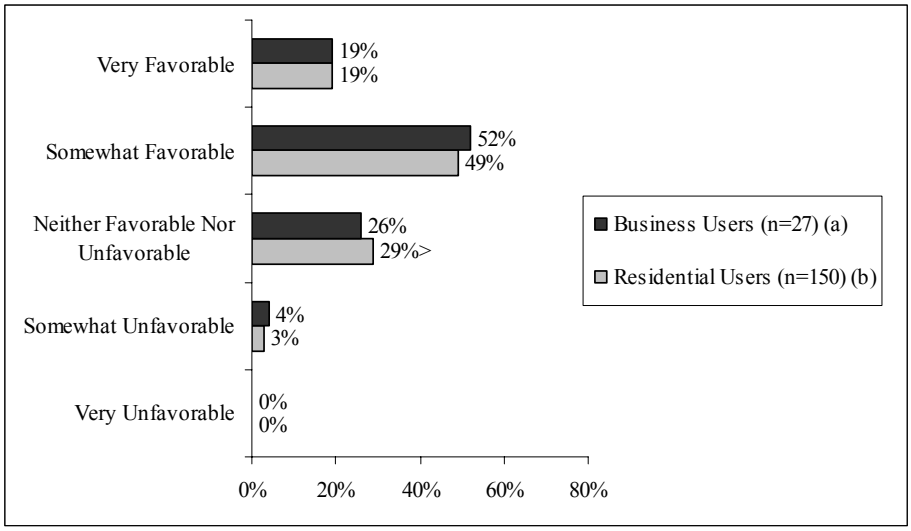
Mean Rating on a 5-Point Agreement Scale	Residential Users (n=150) (a)	Business Users (n=27) (b)	Total Users (n=177)
This Web site looks appealing	3.79	3.85	3.80
The energy-saving tips and recommendations are credible information	3.80	3.70	3.79
This Web site loads quickly and easily	3.75	3.85	3.77
The Web site is laid out well	3.75	3.74 >	3.75
This Web site is interesting	3.73	3.74	3.73
This Web site is useful to me	3.70	3.63	3.69
This web site is easy to navigate	3.67	3.70	3.68
I would recommend this site to others	3.65	3.52	3.63
I would bookmark this site	3.48	3.67	3.51
Overall, the Web site was helpful in getting me to manage my energy usage	3.35	3.41	3.36
This Web site was helpful in getting me to make decisions regarding purchasing energy efficient equipment	3.26	3.04	3.23
It was hard to get the information I was looking for	2.57	2.59	2.57
This Web site is hard to understand	2.31	2.44	2.33

4.6 USEFULNESS/SATISFACTION

4.6.1 Overall Impression

The majority of Users (~70%) assess the California Energy Connection Web site favorably (Somewhat or Very). More than one-quarter of Users were unable to commit to evaluating the site as favorable or unfavorable. This is a marked increase for Residential Users over last wave. No Users found the Web site to be Very Unfavorable.

Exhibit 4-24
Overall Impression of California Energy Connection Web Site



4.6.2 Usefulness of Activities

Most aspects of the Web site are evaluated as being fairly helpful. Repeat visitors are significantly more likely to assess several features as being more useful than are one-time visitors: Energy Calculators; The site overall; Energy saving tips; Bill Analyzer; and, Energy analysis and custom savings recommendations. The only two areas of the site that received an overall rating of less than 3 are the "My Home Page" and getting information about the California energy market.

Exhibit 4-25
Usefulness of Activities on California Energy Connection Web Site

Mean agreement on a 5-point scale where 5 means "extremely useful."

Usefulness of Activities	One-Time Visitors (n=60) (a)		Return Visitors (n=117) (b)	
Use energy calculators to see the costs of various appliances	3.29		3.82	a
Look for rebate opportunities	3.50		3.74	
Look at my energy usage history	3.06	<	3.70	
The site overall	3.22		3.72	a
Get tips on energy savings	3.21		3.69	a
Learn about energy-saving products	3.30		3.55	
Use the Bill Analyzer to find out why my energy bill may have changed	2.80		3.63	a
Get an energy analysis and custom savings recommendations	2.89	<	3.54	a
See current news about energy	3.05		3.36	
Find out about renewable energy sources	2.94		3.34	
Get information about the California energy market	2.64		3.14	
Use "My Home Page" to customize my Web site account	2.38		3.17	

4.6.3 Consumer Attitude Toward Activities

Return visitors somewhat agreed that California Energy Connection 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 California Energy Connection Web site. As far as influencing energy behavior is concerned, California Energy Connection Web site did not seem to fully convince visitors to change energy-usage habits.

Exhibit 4-26
Consumer Attitude Toward Activities on California Energy Connection Web Site

Mean agreement on a 5-point scale where 5 means "strongly agree."

Mean Rating on a 5-Point Agreement Scale	One-Time Visitors (n=60) (a)	Return Visitors (n=117) (b)	
This Web site looks appealing	3.58	3.91	a
The energy-saving tips and recommendations are credible information	3.57	3.90	a
This Web site loads quickly and easily	3.53	3.89	a
The Web site is laid out well	3.48	3.88	a
This Web site is interesting	3.45	3.88	a
This Web site is useful to me	3.38	3.85	a
This web site is easy to navigate	3.35	3.85	a
I would recommend this site to others	3.32	3.79	a
I would bookmark this site	3.32	3.61	
Overall, the Web site was helpful in getting me to manage my energy usage	3.08	3.50	a
This Web site was helpful in getting me to make decisions regarding purchasing energy efficient equipment	3.05	3.32	
It was hard to get the information I was looking for	2.75	2.48	
This Web site is hard to understand	2.45	2.26	

4.6.4 Level of Satisfaction With Information

Satisfaction with features remains consistent between User types with the exception of getting energy saving tips. Once again, the two newest areas of the site, "My Home Page" and the "Bill Analyzer" had the lowest overall satisfaction ratings.

Exhibit 4-27
Level of Satisfaction with Information Obtained on California Energy Connection Web Site

Mean agreement on a 5-point scale where 5 means "very satisfied."

Level of Satisfaction with Information Obtained @CEC.com	One-Time Visitors (n=60) (a)		Return Visitors (n=117) (b)
Look for rebate opportunities	3.52		3.92
Use energy calculators to see the costs of various appliances	3.69		3.87
Get tips on energy savings	3.51		3.93
Learn about energy-saving products	3.63		3.87
Look at my energy usage history	3.69		3.82
See current news about energy	3.71	>	3.69
Get an energy analysis	3.42		3.73
Find out about renewable energy sources	3.40		3.63
Get information about the California energy market	3.45		3.57
Use the Bill Analyzer to find out why my energy bill may have changed	3.00		3.62
Use "My Home Page" to customize my Web site account	3.29		3.50

4.6.5 Reasons for Overall Impression

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

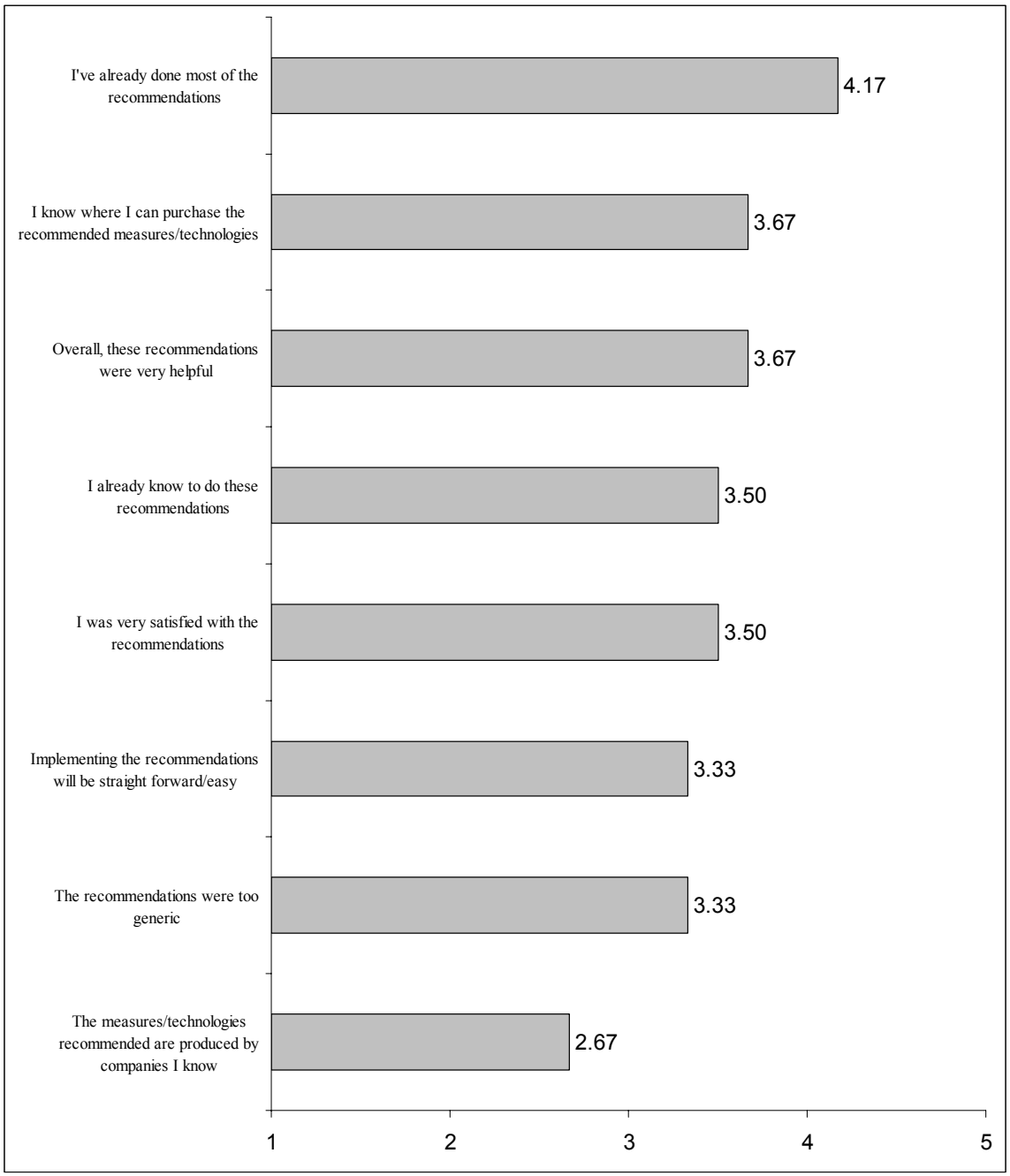
Exhibit 4-28
Reasons for Overall Impression of California Energy Connection Web Site

	Very Favorable (n=28)	Somewhat Favorable (n=75)	Neither Favorable Nor Unfavorable (n=44)	Somewhat Unfavorable (n=6)	Very Unfavorable (n=0)
Informative/useful information/suggestions	64%	49%	0%	0%	0%
Easy/quick to use/navigate	29%	19%	0%	0%	0%
Complicated/hard to use/takes to much time	0%	11%	7%	0%	0%
Information was not useful/current	0%	8%	9%	17%	0%
Not enough use to evaluate/too long ago	0%	8%	59%	0%	0%
Technical issues	0%	0%	0%	33%	0%
Needs link to past usage information	0%	7%	7%	17%	0%
Other	25%	15%	16%	50%	0%

4.6.6 Suggestions for Additional Information or Services

Exhibit 4-29 shows how useful users found the audit recommendations. Most users who had received recommendations had already implemented them prior to completing the audit. Some felt they already knew to do these recommendations. Customers were somewhat satisfied with the recommendations

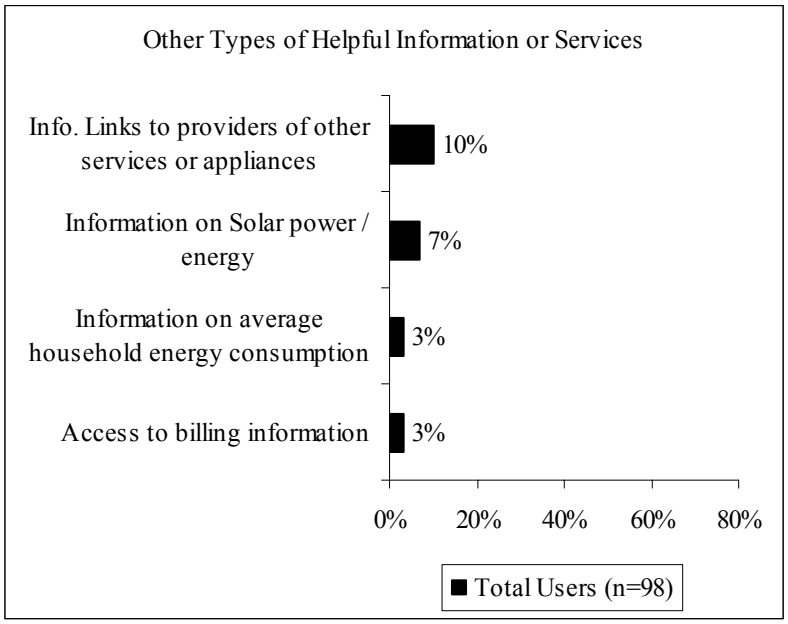
Exhibit 4-29
Usefulness of Recommendations on California Energy Connection
Mean agreement on a 5-point scale where 5 means "strongly agree"
(N = 6)



4.6.7 Suggestions for Additional Information or Services

The majority of Users had no suggestions for additional information or services needed on the Web site. Among those who did make suggestions, links to services providers and information on solar power were most prevalent.

Exhibit 4-30
Suggestions for Additional Information or Services to be Included on California Energy Connection Web Site



4.7 FINDINGS AND RECOMMENDATIONS

This section summarizes customer survey findings, with special emphasis on a year-over-year comparison.

4.7.1 User Profiles

Non-User Profile. Customers who have not visited California Energy Connection Web site say they are very likely to use energy efficiency web sites, and to view PG&E as a useful source of energy efficiency information. The majority of non-users use Yahoo! or Google to find information on energy efficiency. They also turn to PGE.com for energy efficiency information. About 11% of non-users report being aware of the California Energy Connection Web site but not yet accessing it. These aware non-users tend consider themselves well-informed about how to save energy and feel that credible information about efficiency is easy to find.

User Profile. As in 2002, California Energy Connection Web site users are more likely to be older, better educated and have higher income levels than non-users. In addition, users are much more likely to reside in single family homes than non-users. The average age of a user of California Energy Connection Web site increased significantly in 2003.

The free Amazon gift motivates users to visit the website. They also visit to find energy saving tips and rebate offers more so than any other reason.

Usage Patterns. Perhaps due to decreased sensitivity to the energy crisis, usage of almost all of the Web site features has declined since last year. The more advanced features of the Web site, particularly the Bill Analyzer, has not generated much interest. The Web site continues to fall short in convincing Users they have learned enough to actually decrease their energy efficiency. The statement, "This Web site was helpful in getting me to make decisions regarding purchasing energy efficient equipment" continues to be rated very low by Users.

Sources of Awareness. Mailings and utility bill information are the most frequent way that customers learn of California Energy Connection Web site, as well as PG&E's sponsorship of that Web program.

4.7.2 Summary of Findings

We summarize the survey findings presented in this chapter, with emphasis on year-over-year comparisons (such as overall impression, opinions of the user experience, ease of use, most visited areas, frequency of visits, reasons for visit, intentions to return, and sources of awareness). While survey results indicate few statistically significant differences between customer responses in Year 1 and Year 2, they offer some directional value. These directional findings are highlighted below. We also summarize users' opinion on enhancements to the Web site. User ratings are based on a 5 point scale, where 5 means extremely positive. Discussion focuses on residential users, because there are relatively few business users.

Overall Assessment.[1] Users' overall impressions of California Energy Connection Web site have declined year over year (although not a statistically significant change). Users were less favorably disposed toward California Energy Connection Web site in 2003. While few held a "very unfavorable opinion" of the Web site, user response was less than enthusiastic. Residential users who were "somewhat" favorably inclined toward the Web site fell from 63% to 49%, while the number of residential customers who were neither favorably nor unfavorably impressed tripled to nearly 30%. These lukewarm overall impressions are reinforced by users' opinions of the usefulness of Web site activities. In particular, one-time visitors rated site activities much lower than last year (Exhibit 4-26). User experience, such as ease of use, has not changed much from year to year. This may explain why satisfaction (with the exception of the two new site features discussed below) remained unchanged.

Year 2 Web Site Enhancements. Two new areas of the site, "My Home Page" and the Bill Analyzer, seemed to be the least important to users. Users found these features to be the hardest to use and were less satisfied with them than any other element of the Web site. They were also the least visited, even though they were noticed by the majority of users. Usability results, offered in Chapter 3, confirm these findings. In usability tests, respondents were frustrated at the prospect of *"answering so many questions."*

[1] For longitudinal data, see Appendix Exhibit D-1, Overall Impression of California Energy Connection, Year 1 versus Year 2.

User Opinions About the Web Site.[2] Residential users rated the Web site less favorably in terms of usability, interest, appeal, and usefulness (although not a statistically significant change). In 2003, residential users felt that the Web site was slightly less useful and interesting than the previous year (although responses in 2003 still indicated a favorable result). Both residential and business users gave their lowest rating to the Web's usefulness in encouraging them to purchase energy efficient products, finding California Energy Connection Web site to be less useful than in 2002. Both residential and business users in believed the Web site to be less "helpful in getting me to make decisions regarding purchasing energy-efficiency equipment."

Usability.[3] No clear pattern emerges regarding ease of use from year to year. Residential users found energy calculators, energy savings tips, information about renewable energy sources, and market news to be slightly more easy to use in 2003, while usability of usage history, product and rebate information declined a little.

Intention to Return.[4] Intent to return remains positive. 90% of 2003 residential users intend to return, versus 86% in Year 1. Year 2 visitors were increasingly interested in returning to look for rebate opportunities and get energy savings tips, find out about renewable energy sources and use energy calculators.

Most Popular Areas.[5] Overall, reported use declined for each of the trackable Web site areas. One-time visitors continued to seek energy savings tips (94% versus 75% in 2002), but visits to the audit tool, energy calculators and product information dropped dramatically in 2003 (all statistically significant at the 95% confidence interval).

Frequency of Visits.[6] The modal category remained 2-3 visits, while one-time visitation among residential customers increased to 33%.

Reason for Visit.[7] More customers came to the site in order to get a free gift in 2003 (57% versus 46%). The audit tool motivated far fewer customers to visit the site (27% in 2003 versus 47% in 2002). Likewise, interest declined in using energy calculators, learning about energy-saving products, energy usage history and even energy-saving tips year over year. Rebate opportunities continued to capture customers' interest in 2003.

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[2] For longitudinal data, see Appendix Exhibit D-2, User Opinions about California Energy Connection Year 1 versus Year 2.

[3] See Appendix Exhibit D-3, Usability of California Energy Connection, Year 1 versus Year 2.

[4] See Appendix Exhibit D-4, Intentions to Return and Future Visits, Year 1 versus Year 2.

[5] See Appendix Exhibit D-5, Most Visited Areas of California Energy Connection, Year 1 versus Year 2.

[6] See Appendix Exhibit D-6, Frequency of Visits, Year 1 versus Year 2.

[7] See Appendix Exhibit D-7, Reason for Visit, Year 1 versus Year 2.

Sponsorship Awareness.[8] Two-thirds of residential users were aware that PG&E sponsored the site in 2003, compared with 41% in 2002. More business users associated California Energy Connection Web site with the CPUC in 2003, 37% versus 31%.

Sources of Web Site Awareness.[9] For residential customers, sources of awareness remained unchanged in 2003. They continued to learn about California Energy Connection Web site from PG&E, typically a notice in the mail or PGE.com.

[8] See Appendix Exhibit D-8, Sponsorship Awareness, Year 1 versus Year 2.

[9] See Appendix Exhibit D-9, Sources of Web site Awareness, Year 1 versus Year 2.

5. IMPACT EVALUATION

In this section we analyze the effects of the California Energy Connection 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. Comparisons are made to findings from the first year evaluation of Program Year 2002.

The first step of this analysis was to develop an estimate of potential energy savings. Estimates of potential are developed based on all activity on the site since its inception to increase reliability in the estimates. To develop this estimate, 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. As part of the first year evaluation of Program Year 2002, 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. Because the audit's algorithms for estimating energy savings have not been significantly revised, no additional analysis was warranted for this evaluation.

Next, 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.[1] We also 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. Based on these self reported adoption rates and influence, 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.

Comparisons were also made to responses on adoptions, intentions and influence from the Program Year 2002 evaluation. 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. Again, comparisons were made to responses obtained in the Program Year 2002 evaluation.

5.1 ADOPTION (ATTRITION/PATH) ANALYSIS

There were 1,533 registered users on the site as of December 22, 2003. Most of these users (1,336 or 87%) are residential customers. The site was marketed by direct mail to 10,000 residential and 5,000 business "pilot" customers, and as a result 784 residential and 149 business pilot

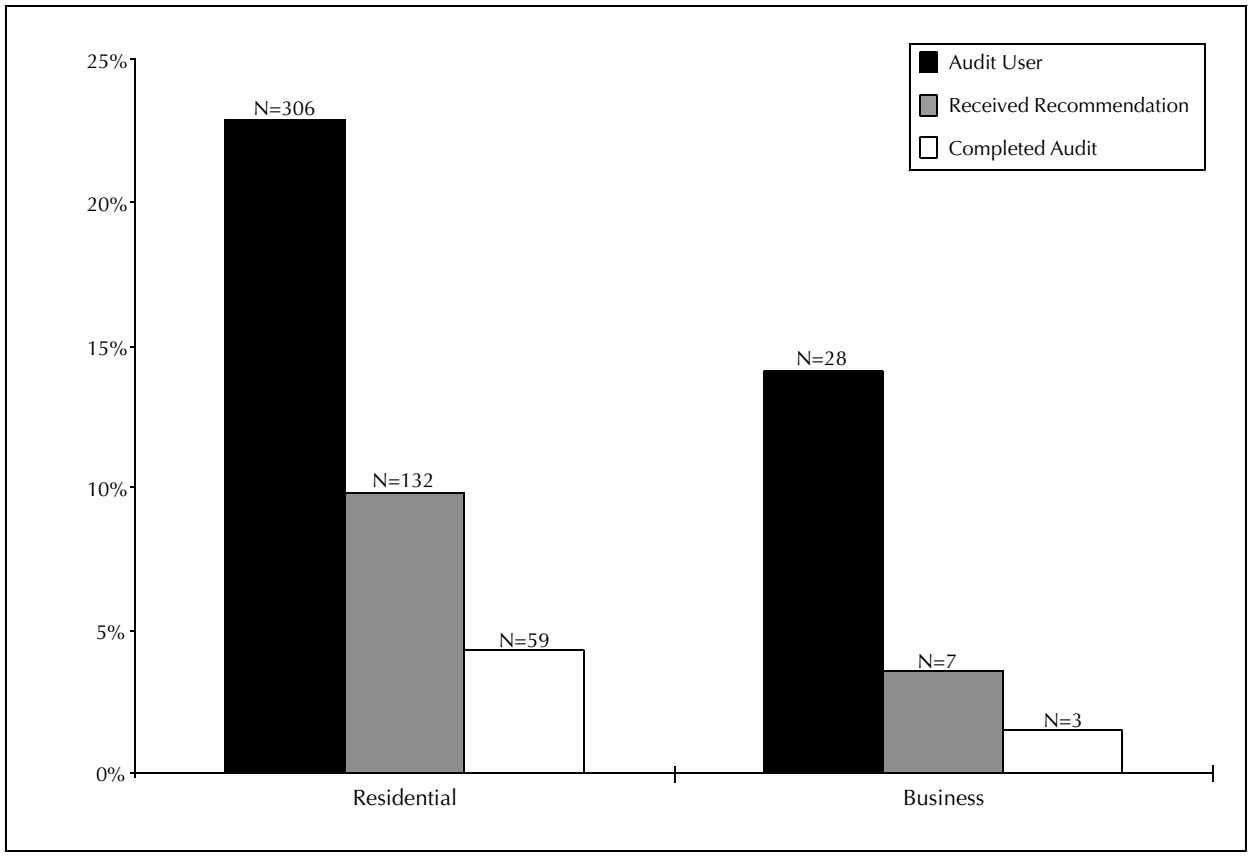
[1]Only three business users completed the entire audit, and only seven completed enough of the audit to receive recommendations from the Business Analyzer audit tool, so this component of the Web site was not analyzed as part of this activity.

customers registered with the site as of this date. This represents nearly an 8% penetration rate for residential customers and 3% for businesses.

5.1.1 Path Analysis

Exhibit 5-1 shows the percentage of users that registered with the Home and Business Analyzer audit tools, the percentage that received recommendations (by completing at least a portion of the audit or using FastTrack for high-level energy savings recommendations), and the percentage that completed the entire audit.

Exhibit 5-1
Registered User Attrition Trends
All Registered Users Since Web Site Inception



User Interest in Audit Tool. Of the 1,533 registered users, 22% registered with the energy audit portion of the site, which contained the Home Analyzer and Business Analyzer audit tools. Residential users were more likely to register with the audit site – 23% of residential users versus 14% of business users. These registration rates with the audit site suggest that perhaps the audit tool may not have been of great interest to users.

Audit Completion. Over forty percent of the users that registered with the audit portion of the site 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 9% of all users registered with the California Energy Connection Web site that received audit recommendations. Furthermore, only 4% of users completed the entire audit (or about 19% that registered with the audit portion of the site).

Relative to the Program Year 2002 evaluation, these rates are fairly similar. One positive increase relative to the 2002 evaluation is that users that register with the audit are more likely to complete the entire audit. As mentioned above, 19% of those customers that registered with the audit portion of the site completed the entire audit, which compares to a rate of only 13% from the Program Year 2002 evaluation.

5.2 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.[2] 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 more 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.

5.2.1 Potential Energy Savings Associated with the Home Analyzer Audit

As discussed above in Section 5.1, through December 22, 2003, the California Energy Connection Web site had attracted a total of 1,533 registered users, of which 1,336 were

[2] Because only three business users completed the audit and only seven received audit recommendations, the potential for the Business Analyzer is not addressed.

residential users. Of these 1,336 residential users, 132 received recommendations by completing all or a portion of the Home Analyzer audit. Only three of the registered business users completed the Business Analyzer audit and only seven received recommendations. However, three quarters of the users did visit the section of the Web site that provided energy savings tips.

Exhibit 5-2 below summarizes the recommendations received by the 132 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 the ten low cost/no cost and ten investment level measures that have the largest savings potential. 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 132 users that received recommendations and the 1,336 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 5-2
Savings Potential of Home Analyzer Audit
Based on 132 Audits Completed Through December 22, 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								
CL2	Raise your thermostat settings of your air conditioner.	35	26,373	-	199.8	-	19.7	-
HT1	Lower the thermostat setting of your heater	109	6,748	5,481	51.1	41.5	5.1	4.1
LT3	Use compact fluorescent lamps in high-use lamps	62	18,858	-	142.9	-	14.1	-
LT4	Replace halogen torchiere with compact fluorescent torchiere	41	13,857	-	105.0	-	10.4	-
LT7	Use compact fluorescent lamps in recessed fixtures	31	14,613	-	110.7	-	10.9	-
OA10	Turn off your computer when not in use	43	100,851	-	764.0	-	75.5	-
WE3	Caulk windows and doors to prevent drafts	119	(2,224)	6,258	(16.8)	47.4	(1.7)	4.7
WH10	Lower the temperature setting of your water heater	72	3,886	2,312	29.4	17.5	2.9	1.7
WH13	Install low flow showerheads	58	3,527	1,779	26.7	13.5	2.6	1.3
WH14	Take shorter showers	71	8,474	3,040	64.2	23.0	6.3	2.3
Total - All Low Cost/No Cost Measures		**2,169**	**253,008**	**25,419**	**1,917**	**193**	**189**	**19**
Key Investment Level Measures								
CL10	Replace your central air conditioner with a more efficient system	24	32,851	-	248.9	-	24.6	-
FS13	Replace your refrigerator with a more efficient model	39	24,348	-	184.5	-	18.2	-
HT16	Replace your heating system with a more efficient system	80	13,530	1,907	102.5	14.4	10.1	1.4
WE1	Replace the windows in your home with energy efficient windows	45	1,287	4,711	9.8	35.7	1.0	3.5
WE5	Improve attic, wall or foundation insulation	89	562	6,164	4.3	46.7	0.4	4.6
WE6	Seal leaks in air ducts	114	12,215	2,502	92.5	19.0	9.1	1.9
WE7	Install exterior solar screens on windows	64	71,127	-	538.8	-	53.2	-
WH17	Install heat traps for your water heater	108	5,330	1,288	40.4	9.8	4.0	1.0
WH22	Replace your water heater with a more Efficient model	57	14,936	1,125	113.2	8.5	11.2	0.8
WH24	Install a heat recovery water heating system	7	10,335	-	78.3	-	7.7	-
Total - All Investment Level Measures		**982**	**212,616**	**19,768**	**1,611**	**150**	**159**	**15**
TOTAL - ALL MEASURES RECOMMENDED		**3,151**	**465,624**	**45,187**	**3,946**	**383**	**349**	**34**

It is important to note that this analysis is based on a sample of 132 users that received recommendations, and is best 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 part of the Program Year 2002 evaluation, we assessed the accuracy and reliability of these savings estimates generated by both the Home and Business Analyzers. As part of this assessment we analyzed both the end use annual energy consumption as well as the measure specific energy savings estimates developed by the

audit tool. Overall, the Home Analyzer was found to provide credible estimates of savings, however the Program Year 2002 evaluation did identify a few potential issues with some of the measure level savings and end use consumption estimates.

Overall, these 132 users received over 3,000 recommendations, or nearly 24 recommendations per audit (same as found in the 2002 evaluation). The majority (69%) of these recommendations were for low cost and no cost measures. The total savings associated with all recommendations was 465 MWh and 45,187 therms. Low cost/no cost measures were responsible for 54% of the potential kWh savings and 56% of the potential therm savings.

The average energy savings potential for an audit was 3,946 kWh and 383 therms. For each registered user, there was an average of 349 kWh and 34 therms of potential energy savings if all recommendation were followed (for the 2002 evaluation, the average potential per registered user was nearly the same at 340 kWh and 32 therms).

As discussed in the Program Year 2002 evaluation, there are a few measures for which there is some concern with the reliability of the savings estimates. In particular, measure ID OA10, turning off computers when not in use, contributes 22% of the overall potential electric energy savings.[3] Measure ID WE3, caulking windows and doors, contributes a negative savings amount [4].

Given the comprehensiveness of the audit recommendations, it is reasonable the Home Analyzer would provide recommendations with the potential to save 3,946 kWh and 383 therms, which corresponds to roughly half of PG&E's reported annual electric and gas energy consumption. However, it is extremely unlikely that the this level of savings would be achieved by the average audit participant. The Program Year 2002 evaluation included an assessment of other evaluations conducted on audit programs. The most relevant finding was based on the September 2002 evaluation of Southern California Edison's (SCE) on-line home energy audit conducted by Ridge and Associates. This study found that residential customers that completed SCE's 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.[5] This savings of 171 kWh (which was achieved with far fewer recommendations given per audit, on average) is less than 5% of the California Energy Connection's per audit savings.

As discussed in the Program Year 2002 evaluation, it probably 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. In fact, based on a small sample of surveyed customers, as discussed in more detail below, it was found that audit

[3] This estimate of savings is large because customers indicated in the audit that they leave their computer on all day and night.

[4] The audit's savings estimate assumes that during the cooling season, less hot air escapes from a weatherized home, increasing the cooling load, and resulting in an increase in electric usage during the summer.

[5] It should also be noted that the 2002 Statewide Residential Audit Program (which includes an on-line audit as one of its various delivery mechanisms) is currently being evaluated by SCE and Ridge and Associates again, and may provide further information on typical energy savings associated with an on-line audit program.

participants were influenced to adopt, or intend to adopt 10.5% of the low cost/no cost measures, and 2.5% of the investment level measures, weighted by energy savings.

If the California Energy Connection Web site is capable of influencing customers to adopt 10.5% of the savings associated with the low cost/no cost audit recommendations and 2.5% of savings associated with the investment level measures, that would result in a savings of approximately 24 kWh and 2.4 therms for each registered residential user. On a per audit basis, this would be equivalent to 240 kWh and 24 therms, which represents an average reduction in usage of approximately 3% based on PG&E's reported whole premise usage. (Interestingly, the Program Year 2002 evaluation conjectured that a reasonable savings potential estimate would be 248 kWh and 24 therms per audit).

5.2.2 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. Three quarters 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[6]. Focusing solely on residential recommendations (as we only have sufficient 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 75% of the users view these tips, and another 10% (132 out of 1,332 registered residential customers received audit recommendations) 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 237 kWh and 55 Therms.[7]

As discussed in more detail below, it was found that surveyed users were very influenced to adopt 2.7% of the energy savings tips since visiting the Web site. The Web site also influenced another 6.9% to commit to adopting the energy savings tips within the next year. If we assume that half of those that intend to adopt actually will adopt, that results in an adoption rate of approximately 6.2%. This would correspond to an average savings of approximately 14.7 kWh and 3.4 therms (extremely close to the 15 kWh and 3.5 therms discussed in the Program Year 2002 evaluation).

5.2.3 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 39 kWh and 5.8 therms per registered user (again, extremely close to the 41 kWh and 6 therms discussed in the Program

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[6] 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.

[7] This is a decrease from the Program Year 2002 evaluation, as fewer customers claim to be visiting the energy savings tips section of the site (75% now versus 93% last year).

Year 2002 evaluation). 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.

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, which were used to help develop these rough estimates of potential energy savings.

5.3 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.

Furthermore, results are compared to those found in the Program Year 2002 evaluation.

5.3.1 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 no business users surveyed had completed the Business Analyzer.

Audit Adoption Rates

Exhibit 5-3 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 six customers that received audit recommendations responded to the quantitative survey, and the sample size for a given measure never exceeded five.

Exhibit 5-3
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	50%	50%	0%	0%	2
Insulate hot water pipes for your water heater	WH19	60%	0%	0%	40%	5
Properly maintain your water heater	WH16	40%	20%	40%	0%	5
Install low flow showerheads	WH13	0%	0%	0%	100%	2
Install efficient faucet heads (aerators) on bathroom and kitchen sinks	WH12	100%	0%	0%	0%	1
Lower the temperature setting of your water heater	WH10	0%	33%	33%	33%	3
Air dry dishes	WH7	60%	0%	20%	20%	5
Wash full loads of dishes when possible	WH5	100%	0%	0%	0%	1
When not washing full loads of clothes match the load setting to the size of the load	WH2	80%	20%	0%	0%	5
Wash full loads of clothes when possible	WH1	100%	0%	0%	0%	1
Caulk windows and doors to prevent drafts	WE3	50%	0%	17%	33%	6
Use compact fluorescent lamps in high-use lamps	LT3	80%	0%	0%	20%	5
Turn lights off when you're not using them	LT1	75%	25%	0%	0%	4
Lower the thermostat setting of your heater	HT1	100%	0%	0%	0%	4
Raise the temperature setting of your refrigerator	FS9	40%	20%	0%	40%	5
Properly maintain your refrigerator and clean the coils	FS8	80%	0%	20%	0%	5
Total No Cost / Low Cost Weighted by Number of Recommendations		**61%**	**10%**	**10%**	**19%**	**59**
Weighted by Total Energy Savings		**60%**	**5%**	**10%**	**26%**	**59**
Investment Level Measures						
Install heat traps for your water heater	WH17	20%	20%	20%	40%	5
Replace your clothes washer with a horizontal axis (side loading)	WH4	0%	0%	0%	100%	2
Seal leaks in air ducts	WE6	60%	20%	0%	20%	5
Improve attic, wall or foundation insulation	WE5	50%	25%	0%	25%	4
Insulate your air ducts	WE4	100%	0%	0%	0%	1
Replace the windows in your home with energy efficient windows	WE1	50%	0%	50%	0%	2
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%	1
Total Investment Level Weighted by Number of Recommendations		**38%**	**14%**	**14%**	**33%**	**21**
Weighted by Total Energy Savings		**39%**	**12%**	**23%**	**26%**	**21**
TOTAL Weighted by Number of Recommendations		**55%**	**11%**	**11%**	**23%**	**80**
Weighted by Total Energy Savings		**51%**	**8%**	**16%**	**26%**	**80**

Users reported that since visiting the Web site, they had adopted 10% of the no cost/low cost measures that were given, and had intentions to adopt another 10% of the recommendations. When weighted by the energy savings associated with these measures, users adopted fewer recommendations with high savings values, having adopted only 5% of the potential energy

savings from recommendations since visiting the Web site. User intentions again comprised 10% of the potential energy savings.

It was interesting to find that more users (14%) had adopted investment level measures, since visiting the Web site. As part of the 2002 evaluation, no users had adopted investment level measures at the time of the survey. This is attributable to the Program Year 2003 evaluation surveying users that had completed the audit as many as 11 months prior to the survey date. In the 2002 evaluation, all users had completed the audit within a month or two of conducting the survey. Clearly, making the decision to purchase an investment level measure takes more time and resources, explaining the difference between the two evaluation results.

Surveyed users also indicating having intentions to adopt another 14% of the investment level measures within the next year. When weighted by energy savings potential, users adopted 12% of the investment level measures since visiting the Web site, and intentions to adopt another 23% within the next year.

Overall, across all measures, users reported having adopted 11% of the recommendations (8% of the energy savings potential) since visiting the Web site, and had intentions to adopt another 11% of the recommendations (16% of savings).

Exhibit 5-4 below compares the self-reported adoption rates from the evaluations of Program Year 2002 and Program Year 2003.

Exhibit 5-4
Comparison of Adoption Rates for Home Analyzer Audit Recommendations
Program Year 2002 Evaluation vs. Program Year 2003 Evaluation

Energy Saving Measures	Year	Adopted Measure Prior to Visting Website	Adopted Measure Since Visiting Website	Plan to Adopt Measure within Year	Do Not Plan to Adopt Measure
Total No Cost / Low Cost					
Weighted by Number of Recommendations	**2002**	**51%**	**15%**	**17%**	**17%**
Weighted by Total Energy Savings		**45%**	**22%**	**15%**	**18%**
Weighted by Number of Recommendations	**2003**	**61%**	**10%**	**10%**	**19%**
Weighted by Total Energy Savings		**60%**	**5%**	**10%**	**26%**
Total Investment Level					
Weighted by Number of Recommendations	**2002**	**10%**	**0%**	**20%**	**70%**
Weighted by Total Energy Savings		**8%**	**0%**	**24%**	**68%**
Weighted by Number of Recommendations	**2003**	**38%**	**14%**	**14%**	**33%**
Weighted by Total Energy Savings		**39%**	**12%**	**23%**	**26%**
TOTAL					
Weighted by Number of Recommendations	**2002**	**40%**	**10%**	**17%**	**32%**
Weighted by Total Energy Savings		**30%**	**13%**	**19%**	**38%**
Weighted by Number of Recommendations	**2003**	**55%**	**11%**	**11%**	**23%**
Weighted by Total Energy Savings		**51%**	**8%**	**16%**	**26%**

Perhaps the most significant difference between the two evaluation results is the number of customers that had already adopted the recommendation prior to visiting the Web site. Weighted by energy savings, approximately half of the recommendations were already

adopted in 2003, versus only 30% in 2002. This may be a function of the energy crisis, and the call to conserve energy, that was so widely publicized. As discussed above, another interesting finding is the increase in adoption of investment level recommendations since visiting the site, which is likely due to the timing of the 2003 survey occurring much later after the audits had been performed. It is also of note that in 2002, users had intentions to adopt 20% of the investment level recommendations within the next year, and in 2003 users claimed to have adopted 14% of the investment level recommendations since visiting the Web site (most of which were surveyed 6 to 10 months after having completed the audit). This is an indication that customer's stated intentions are somewhat reliable.

Because the sample sizes for both evaluations are so small, it is difficult to draw reliable conclusions. But it is reassuring to see that overall customer adoption rates and intentions have not changed dramatically. Normalizing for the increase in customers that had already adopted measures, customers adopted or planned to adopt roughly half of the remaining recommendations (not already adopted) in both 2002 and 2003.

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 5-5 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 all of the measure adoptions and about half of the intentions to adopt.

Exhibit 5-5
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	50%	100%	0%	0%	2
Insulate hot water pipes for your water heater	WH19	0%	0%	0%	0%	5
Properly maintain your water heater	WH16	20%	100%	40%	50%	5
Install low flow showerheads	WH13	0%	0%	0%	0%	2
Install efficient faucet heads (aerators) on bathroom and kitchen sinks	WH12	0%	0%	0%	0%	1
Lower the temperature setting of your water heater	WH10	33%	100%	33%	0%	3
Air dry dishes	WH7	0%	0%	20%	0%	5
Wash full loads of dishes when possible	WH5	0%	0%	0%	0%	1
When not washing full loads of clothes match the load setting to the size of the load	WH2	20%	100%	0%	0%	5
Wash full loads of clothes when possible	WH1	0%	0%	0%	0%	1
Caulk windows and doors to prevent drafts	WE3	0%	0%	17%	100%	6
Use compact fluorescent lamps in high-use lamps	LT3	0%	0%	0%	0%	5
Turn lights off when you're not using them	LT1	25%	100%	0%	0%	4
Lower the thermostat setting of your heater	HT1	0%	0%	0%	0%	4
Raise the temperature setting of your refrigerator	FS9	20%	100%	0%	0%	5
Properly maintain your refrigerator and clean the coils	FS8	0%	0%	20%	100%	5
Influenced No Cost / Low Cost Adoptions/Intents Weighted by Number of Recommendations		**10%**	**100%**	**10%**	**50%**	**59**
Weighted by Total Energy Savings		**5%**	**100%**	**10%**	**60%**	**59**
Investment Level Measures						
Install heat traps for your water heater	WH17	20%	0%	20%	100%	5
Replace your clothes washer with a horizontal axis (side loading)	WH4	0%	0%	0%	0%	2
Seal leaks in air ducts	WE6	20%	0%	0%	0%	5
Improve attic, wall or foundation insulation	WE5	25%	0%	0%	0%	4
Insulate your air ducts	WE4	0%	0%	0%	0%	1
Replace the windows in your home with energy efficient windows	WE1	0%	0%	50%	0%	2
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%	1
Influenced Investment Level Apoptions/Intents Weighted by Number of Recommendations		**14%**	**0%**	**14%**	**33%**	**21**
Weighted by Total Energy Savings		**12%**	**0%**	**23%**	**10%**	**21**
TOTAL INFLUENCED ADOPTIONS/INTENTS Weighted by Number of Recommendations		**11%**	**67%**	**11%**	**44%**	**80**
Weighted by Total Energy Savings		**8%**	**34%**	**16%**	**27%**	**80**

As a result, about 5% of the potential energy savings across all recommended low cost/no cost measures were adopted due to the influence of the audit. Furthermore, another 6% of the potential energy savings recommendations are likely to be adopted within the next year as a result of the audit.

Across all investment level measures, the Web site had no significant influence over any of the investment level measures adopted since visiting the Web site, but influenced about one third of users' intentions to adopt the recommendations (10% of the energy savings). As a result, users had intentions to adopt within the next year about 2% of the potential energy savings across all recommended investment level measures, due to the influence of the audit.

Across all measures, users reported being very influenced to adopt 7% of all recommended measures, accounting for a total of 3% of the potential energy savings. Furthermore, users had intentions to adopt another 5% of the recommended measures within the next year, accounting for a total of 4% of the potential energy savings.

It is important to note that these results are based on a very small sample, and should NOT be considered to be statistically significant.

Relative to the findings from the 2002 evaluation, program influence has not changed dramatically, as illustrated in Exhibit 5-6.

Exhibit 5-6
Comparison of Influence on Adoptions of Home Analyzer Audit Recommendations
Program Year 2002 Evaluation vs. Program Year 2003 Evaluation

Energy Saving Measures	Year	Adopted Measure Since Visiting Website	Percent Very Influenced by Website to Adopt	Influenced Adoption Rate	Plan to Adopt Measure within Year	Percent Very Influenced by Website to Adopt	Influenced Adoption Rate
Influenced No Cost / Low Cost Adoptions/Intents							
Weighted by Number of Recommendations	2002	9%	60%	5%	9%	53%	5%
Weighted by Total Energy Savings		14%	63%	9%	7%	47%	3%
Weighted by Number of Recommendations	2003	10%	100%	10%	10%	50%	5%
Weighted by Total Energy Savings		5%	100%	5%	10%	60%	6%
Influenced Investment Level Apoptions/Intents							
Weighted by Number of Recommendations	2002	0%	-	-	10%	50%	5%
Weighted by Total Energy Savings		0%	-	-	5%	23%	1%
Weighted by Number of Recommendations	2003	14%	0%	0%	14%	33%	5%
Weighted by Total Energy Savings		12%	0%	0%	23%	10%	2%
TOTAL INFLUENCED ADOPTIONS/INTENTS							
Weighted by Number of Recommendations	2002	6%	60%	4%	9%	52%	5%
Weighted by Total Energy Savings		8%	63%	5%	6%	34%	2%
Weighted by Number of Recommendations	2003	11%	67%	7%	11%	44%	5%
Weighted by Total Energy Savings		8%	34%	3%	16%	27%	4%

Overall, 2003 found more customers to be influenced to adopt measures, but with less energy savings. However intentions were similar in 2002 and 2003, but energy savings associated with influenced adoptions was higher in 2003. None of these differences were statistically significant.

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, some customers mentioned hassle as a factor, but the large majority gave another unspecified reason. For investment level measures, reasons were split among being too expensive to implement, followed by not having enough information to implement. Overall, however, these three top reasons consisted of only 44% of all responses. These results are provided in Exhibit 5-7 below.

Exhibit 5-7
Reasons for Not Adopting Home Analyzer Audit Recommendations

Reason for not Adopting	Low Cost/No Cost Measures	Investment Level Measures	Overall
Too Expensive	0%	57%	22%
Too Much Hassle	9%	0%	6%
Not Enough Info	0%	43%	17%
Other Reason	91%	0%	56%
Sample Size	11	7	18

Overall, these results are very similar to those found in the 2002 evaluation as shown below.

Exhibit 5-8
Comparison of Reasons for Not Adopting Home Analyzer Audit Recommendations
Program Year 2002 Evaluation vs. Program Year 2003 Evaluation

Reason for not Adopting	2002 Overall	2003 Overall
Too Expensive	22%	22%
Too Much Hassle	15%	6%
Not Enough Info	13%	17%
Other Reason	50%	56%
Sample Size	46	18

Issues Affecting Adoption Rates

The 2002 Program Year evaluation discussed a number of issues that may have been barriers to higher adoption rates. Of the issues considered, the one that is still most prevalent is the fact that many of the recommendations provided have already been adopted by the customer. Surveyed users reported having adopted the 61% of the low cost/no cost recommendations and 38% of the investment level measures, prior to visiting the Web site. All but one of the six respondents agreed with the statement that "I've already done most of the recommendations."

Obviously, customers cannot adopt a measure they have already adopted, but there is another concern as well. The reason we continue to raise this as a potential barrier 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. Of the 6 users that received recommendations and participated in the quantitative survey, half agreed with the statement that the recommendations were too generic (a similar result was found among 11 users surveyed in 2002).

It is important to consider, however, that for the audit to rule out a recommendation due to the customer having already adopted the measure, it may require additional questions to be asked. Therefore, the trade off between increasing the respondent's burden by adding questions, to eliminate providing unnecessary recommendations, may not be worth the effort.

5.3.2 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 5-10 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 114 residential users, relative to the audit analysis.

[9] The analysis of the energy savings tips is limited only to residential users as only 19 business users viewed the tips and responded to the relevant questions in the quantitative survey (compared to 114 residential users).

Exhibit 5-10
Adoption Rates for Residential Energy Saving Tips

Residential Energy Savings Tip	Adopted Tip Since Visting 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	11%	17%		0%	0%
In the summer, turn your thermostat up when you leave your home	5%	17%		8%	44%
Consider installing an Energy Star® programmable thermostat	7%	25%		18%	40%
Consider installing an attic whole house fan	2%	50%		28%	22%
To heat your home, keep the shutters, drapes, and blinds on south-facing windows open during the day	18%	33%		14%	31%
During the cold winter months, close all shutters, drapes, and/or blinds at night	12%	43%		6%	14%
Move your refrigerator-freezer out from the wall for good air circulation and vacuum its condenser coils once a year	17%	21%		38%	58%
Use latex or silicone caulk to fill holes and cracks around windows	11%	17%		38%	37%
Consider using fluorescent light bulbs	13%	33%		13%	27%
Use photo sensors to ensure outdoor lighting is not on in the daytime	4%	20%		18%	43%
Influenced Tip Adoptions:	**10%**	**27%**		**18%**	**38%**

Note: Sample size for each tip was 114 users.

Overall, users reported having adopted 10% of the energy saving tips since visiting the Web site, and intended to adopt another 18% within the year. Overall adoption rates have decreased since the 2002 evaluation, primarily due to more customers having already adopted the measure. As shown below in Exhibit 5-11, 53% of all tips were already adopted in 2003 versus only 48% in 2002. This difference is equivalent to the decrease in adoption or planned adoption rate between 2002 and 2003.

Perhaps the most significant difference between 2002 and 2003 is the adoption of fluorescent light bulbs prior to visiting the Web site, which increased from 42% in 2002 to 65% in 2003. This is understandable given the wide publicity, product acceptance, and decrease in retail price of compact fluorescent lamps.

Exhibit 5-11
Comparison of Adoption Rates for Residential Energy Saving Tips
Program Year 2002 Evaluation vs. Program Year 2003 Evaluation

Residential Energy Savings Tip	Adopted Tip Prior to Visting Website		Adopted Tip Since Visiting Website or Plan to Adopt	
	2002	2003	2002	2003
In the winter, turn your thermostat down when your home is unoccupied	80%	87%	19%	11%
In the summer, turn your thermostat up when you leave your home	65%	65%	24%	13%
Consider installing an Energy Star® programmable thermostat	48%	55%	31%	25%
Consider installing an attic whole house fan	15%	17%	28%	30%
To heat your home, keep the shutters, drapes, and blinds on south-facing windows open during the day	56%	55%	30%	32%
During the cold winter months, close all shutters, drapes, and/or blinds at night	68%	72%	22%	18%
Move your refrigerator-freezer out from the wall for good air circulation and vacuum its condenser coils once a year	32%	29%	59%	55%
Use latex or silicone caulk to fill holes and cracks around windows	41%	40%	42%	49%
Consider using fluorescent light bulbs	42%	65%	43%	26%
Use photo sensors to ensure outdoor lighting is not on in the daytime	32%	40%	26%	22%
Tip adoption percentage:	**48%**	**53%**	**32%**	**28%**

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 5-12 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.

Exhibit 5-12
Influence on Adoptions of Residential Energy Saving Tips

Residential Energy Savings Tip	Adopted Tip Since Visting 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	11%	17%	0%	0%
In the summer, turn your thermostat up when you leave your home	5%	17%	8%	44%
Consider installing an Energy Star® programmable thermostat	7%	25%	18%	40%
Consider installing an attic whole house fan	2%	50%	28%	22%
To heat your home, keep the shutters, drapes, and blinds on south-facing windows open during the day	18%	33%	14%	31%
During the cold winter months, close all shutters, drapes, and/or blinds at night	12%	43%	6%	14%
Move your refrigerator-freezer out from the wall for good air circulation and vacuum its condenser coils once a year	17%	21%	38%	58%
Use latex or silicone caulk to fill holes and cracks around windows	11%	17%	38%	37%
Consider using fluorescent light bulbs	13%	33%	13%	27%
Use photo sensors to ensure outdoor lighting is not on in the daytime	4%	20%	18%	43%
Influenced Tip Adoptions:	**10%**	**27%**	**18%**	**38%**

Overall, the Web site influenced 27% of the measure adoptions and 38% of the intentions to adopt. This is a significant decrease in influence among those measures adopted since visiting the Web site, as shown in Exhibit 5-13. In 2002, 9% of all tips were adopted due to the influence of the Web site compared to under 3% in 2003. However, for both evaluation years approximately 7% of the energy saving tips were likely to be adopted within the year as a result of the Web site.

Exhibit 5-13
Comparison of Influence on Adoptions of Residential Energy Saving Tips
Program Year 2002 Evaluation vs. Program Year 2003 Evaluation

Residential Energy Savings Tip	Very Influenced by Website			
	Adopted Tip Since Visting Website		Plan to Adopt Tip within Year	
	2002	2003	2002	2003
In the winter, turn your thermostat down when your home is unoccupied	12%	2%	2%	0%
In the summer, turn your thermostat up when you leave your home	9%	1%	3%	4%
Consider installing an Energy Star® programmable thermostat	8%	2%	5%	7%
Consider installing an attic whole house fan	0%	1%	14%	6%
To heat your home, keep the shutters, drapes, and blinds on south-facing windows open during the day	6%	6%	5%	4%
During the cold winter months, close all shutters, drapes, and/or blinds at night	8%	5%	2%	1%
Move your refrigerator-freezer out from the wall for good air circulation and vacuum its condenser coils once a year	17%	4%	12%	22%
Use latex or silicone caulk to fill holes and cracks around windows	6%	2%	12%	14%
Consider using fluorescent light bulbs	23%	4%	5%	4%
Use photo sensors to ensure outdoor lighting is not on in the daytime	5%	1%	11%	8%
Influenced Tip Adoptions:	**9%**	**3%**	**7%**	**7%**

The decrease in influence is being driven primarily by CFL and thermostat oriented measures. This is understandable given that these are the measures most advertised by the Flex Your Power campaign, and are among the measures most commonly practiced.

Improving Energy Saving Tips Adoption Rates and Energy Savings

As part of the 2002 evaluation, a recommendation was provided in order to improve the potential achievable energy savings associated with the energy savings tips. It was recommended that the list of the 10 residential and business tips listed be revisited and possibly revised. In 2003, users were influenced to adopt only 3% of the energy savings tips. As shown in Exhibit 5-6, audit users were influenced to adopt 10% of the low cost/no cost measures recommended. Although the audit has the advantage of utilizing actual customer information to tailor the recommendations, it is worth considering some of the audit's recommendations and including them in the list of 10 energy savings tips if these low adoption rates persist.

5.3.3 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 177 users surveyed, 19 (11%) said they purchased energy efficient equipment as a result of visiting either the rebate finder tool, the manufacturer links, or both.

As Exhibit 5-14 shows, 13 people (7% of users) indicated that they had received rebates as a result of visiting the rebate finder, indicating customer interest in rebated equipment.

Exhibit 5-14
Users That Received Rebates for Purchasing Energy Saving Products Found Through the Rebate Finder Tool

	Residential	Business	Total
	11	2	13
Product Purchased with Rebate:			
Dishwasher	4	0	4
Thermostat	3	1	4
Clothes Washer/Dryer	3	0	3
Windows	2	0	2
Efficient Lighting	1	1	2
Water Heater	1	0	1
Air Conditioner	1	0	1
Refrigerator	1	0	1
N	**150**	**27**	**177**

As Exhibit 5-15 shows, 14 customers (8% of users) purchased equipment as a result of visiting the manufacturer links portion of the Web site.

Exhibit 5-15
Users Influenced by the Manufacturer Links to Purchase Products

	Residential	Business	Total
	12	2	14
Products Purchased:			
Clothes Washer	6	0	6
Efficient Lighting	3	2	5
Clothes Dryer	3	0	3
Thermostat	2	0	2
Water Heater	1	0	1
Windows	1	0	1
Refrigerator	1	0	1
Dishwasher	1	0	1
Other	3	0	3
N	**150**	**27**	**177**
No additional sources needed for product purchase	**83%**	**100%**	**86%**

Respondents were also asked if the information provided by the Web site was enough for them to select a product without using any other information sources. As shown above, all but one customer felt the Web site provided sufficient information for them to make their purchase decision.

Although there has been a relative decrease in the percentage of customers purchasing energy savings products using the rebate finder or manufacturer links, there has been a shift in the types of measures adopted.

In 2002 the rebate finder led most customers to purchasing either lighting or refrigerator measures. In 2003, customers were using the rebate finder to aid in their purchase of dishwashers, clothes washers and/or dryers, and thermostats. Furthermore, in 2002, half of the customers used the manufacturer links to aid in the purchase of efficient lighting products. In 2003, most customers used the links to aid in the purchase of a clothes washer and/or dryer in addition to efficient lighting.

Exhibit 5-16
Comparison of Users That Received Rebates for Purchasing Energy Saving Products Found Through the Rebate Finder Tool
Program Year 2002 Evaluation vs. Program Year 2003 Evaluation

	Rebate Tool		Manufacturer Links	
	2002	2003	2002	2003
	10	13	10	14
Products Purchased:				
Efficient Lighting	4	2	5	5
Clothes Washer/Dryer	1	3	1	9
Thermostat	1	4	2	2
Refrigerator	4	1	2	1
Dishwasher	2	4	0	1
Windows	2	2	0	1
Water Heater	1	1	1	1
Air Conditioner	1	1	1	0
Other	2	0	1	3
N	**76**	**177**	**76**	**177**

Eight customers visited both the rebate finder tool and the manufacturer links on the Web site (out of 19 total purchases that visited either portion of the site). 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; nearly 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.

However, none of the six surveyed users that adopted measures as a result of the Home Analyzer audit used the rebate finder to obtain a rebate for their purchase.

These findings are very consistent with the 2002 evaluation. As discussed in the web benchmarking analysis earlier, and consistent with the 2002 evaluation, we recommend 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.

5.3.4 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 5-17
Attitudes on Energy Use

	User			Non-User		
	Residential	Business	Total	Residential	Business	Total
Credible information about saving energy is easy to find	3.39	3.37	3.39	3.77	3.69	3.73
I am well-informed about how to save energy in my home/business	3.81	3.48	3.76	3.89	3.95	3.92
I am aware of information about energy efficiency products offered by manufacturers	3.69	3.67	3.69	3.91	3.90	3.90
All this conservation stuff is just common sense	3.57	3.63	3.58	3.74	3.78	3.76
I've known all this conservation stuff for a long time	3.82	3.41	3.76	3.85	3.75	3.80
PG&E is a useful source of energy efficiency information	3.90	4.00	3.92	3.85	3.87	3.86
Media coverage of the energy crisis in the last year made me use energy more carefully	3.46	3.56	3.47	3.68	3.79	3.73
Total	150	27	177	151	150	301

*1= strongly disagree, 5=strongly agree

The trends in Exhibit 5-17 are very similar to those found in the 2002 evaluation. The exhibit illustrates that 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 continue to feel PG&E is a useful source of energy efficiency information and have a more difficult time finding credible information about saving energy.

As shown in Exhibit 5-18, the attitude scores have not changed significantly, and more importantly, the differences between the user and non-user population are all relatively the same.

Exhibit 5-18
Comparison of Attitudes on Energy Use
Program Year 2002 Evaluation vs. Program Year 2003 Evaluation

	User		Non-User	
	2002	2003	2002	2003
Credible information about saving energy is easy to find	3.41	3.39	3.60	3.73
I am well-informed about how to save energy in my home/business	3.99	3.76	4.05	3.92
I am aware of information about energy efficiency products offered by manufacturers	3.78	3.69	4.04	3.90
All this conservation stuff is just common sense	3.54	3.58	3.73	3.76
I've known all this conservation stuff for a long time	3.72	3.76	3.79	3.80
PG&E is a useful source of energy efficiency information	3.96	3.92	3.78	3.86
Media coverage of the energy crisis in the last year made me use energy more carefully	3.76	3.47	3.70	3.73
Total	76	177	300	301

*1= strongly disagree, 5=strongly agree

Exhibit 5-19 similarly shows that prior to visiting the Web site, users were less knowledgeable about energy efficiency and conservation than non-users. Users showed a noticeable increase in their knowledge **after** they visited the site, and were at a level equivalent to the non-users. 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.

Exhibit 5-19
Knowledge of Conservation and Energy Efficiency

	User			Non-User		
	Residential	Business	Total	Residential	Business	Total
Before visiting web site	6.84	5.93	6.70	7.35	7.42	7.39
After web site visit	7.43	6.89	7.35	-	-	-
Total	150	27	177	151	150	301

* Scale from 1 to 10

Once again, these results are very similar to those found as part of the 2002 evaluation, as shown in Exhibit 5-20.

Exhibit 5-20
Comparison of Knowledge of Conservation and Energy Efficiency
Program Year 2002 Evaluation vs. Program Year 2003 Evaluation

	User		Non-User	
	2002	2003	2002	2003
Before visiting web site	6.76	6.70	7.33	7.39
After web site visit	7.74	7.35	-	-
Total	76	177	300	301

* Scale from 1 to 10

5.4 SUMMARY OF FINDINGS

As was reported in the Program Year 2002 evaluation, there exists 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 1,336 residential users that registered with the site, only 10% received audit recommendations. Although the audit was successful in influencing customers to adopt recommendations, web survey results indicated that some users felt the results were too general and not customized enough. Furthermore, customers reported having already adopted over half of the recommended measures prior to visiting the Web site. 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. Three-quarters 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. As with the audit recommendations, surveyed users report having already adopted more than half of the savings tips prior to visiting the Web site. Potential savings associated with the tips could be improved by reviewing and revising the list of measures presented.

Rebate Finder and Product Information. As with the 2002 evaluation, we found that the site was successful in providing information that led to customer adoptions through the rebate finder, product information and manufacturer links. Approximately 11% of users surveyed

said they purchased energy efficient equipment as a result of visiting either the rebate finder section of the Web site, the manufacturer links, or both (nearly half visited both sections).

Knowledge. Again, similar to the 2002 evaluation, we found that the site was successful in increasing customer knowledge about energy efficiency and conservation. Users continued to show 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 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. CONCLUSION AND RECOMMENDATIONS

This chapter integrates findings presented in the report, summarizing (1) the Web site's usefulness, (2) the effectiveness of California Energy connection in terms of changing energy usage and energy efficiency behaviors, (3) an assessments of improvements to the Web site and (4) benchmarking findings. The report concludes with a set of technical and strategic recommendations.

6.1 USEFULNESS OF CALIFORNIA ENERGY CONNECTION WEB SITE

Web site traffic increased in 2003, largely driven by the Amazon.com gift certificate.

- More users visited the Web site in 2003 than in 2002. The number of unique visitors in November 2003 was nearly triple the amount in November 2003. Likewise, more users moved through the pilot registration path in 2003 than 2002. However, traffic dropped off sharply in December 2003, suggesting the visitation was largely driven by PG&E mailers sent to 17,238 residential and small businesses customers on October 27, 2003, with a limited time Amazon.com offer to visit the Web site.

- Getting an Amazon.com gift certificate was the primary reason that customers visited the site (59%).

- The free gift was the most visited area of the California Energy Connection Web site, followed by energy savings tips and rebate opportunities (user survey)

- However, most areas of the Web site were visited less frequently, on a per user basis (e.g. tips were used by 94% of users in 2002 and only 75% in 2003)

Usability continues to be very good.

- The purpose and function of the site are immediately clear upon visiting the homepage and splash page.

- 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.

- Icons help users differentiate information and links, and also provide an attractive interface.

- Navigation throughout the site is consistent and provides a stable structure in which users can easily find information/content.

- Navigation elements (links and buttons) are consistent and easily recognizable.

- High-level organization of information and corresponding section nomenclature are intuitive; Residential and Business content is clearly distinguished.

- Content is comprehensive, including specific information about products and the electricity market in California.

Users consider the Web site to be credible and view PG&E as a trusted information source.

- Two-thirds of residential users were aware that PG&E sponsored the site in 2003, compared with 41% in 2002. More business users associated California Energy Connection Web site with the CPUC in 2003, 37% versus 31%.

- Respondents generally perceived the Web site and PG&E as credible.
  - Most assumed that the California Energy Connection Web site was a good-faith effort at helping customers reduce energy costs.
  - Respondents in 2003 had a more positive perception of PG&E and were more inclined to regard PG&E as a trusted source than in 2002.
  - Respondents tended to expect PG&E to want to provide unbiased information on how to lower energy use, even though it is apparently "against their interests."

- A few respondents wondered why "this site isn't part of PG&E."

Users made shorter visits in 2003 and did not interact with the Web site much.

- Both web statistics and user survey suggest that usage declined across the board.
  - Users spent far less time at the Web site in 2003. The average length of a visit in December 2003 fell to five minutes, compared with 11 minutes the previous December.
  - In 2003, the longest path typically involved three things: splash page entry, registration and site entry. By contrast, 2002 users tended to enter, register, and visit the Analysis Tools.

Usage has declined across the site, particularly use of the analysis tools.

- User survey results suggest that use declined for each of the trackable Web site areas. Visitors continued to seek energy savings tips (73% versus 94% in 2002), but visits to the audit tool, energy calculators and product information dropped dramatically in 2003. This was one of the few statistically significant differences between Wave 1 and Wave 2 in the quantitative user/nonuser survey.

- Web server statistics also indicate that visits to Analysis Tools dropped off in Year 2, as did Energy Saving Tips. These path statistics are consistent with customer survey results; far less customers reported that they visited the site in order to use the audit tool

- The least visited areas are energy market news and the Bill Analyzer, according to the user survey.

- Web statistics indicate that Energy-saving Products and Rebate Opportunities information areas gained some popularity in 2003. Rebate opportunities continued to capture customers' interest in 2003, according to users who offered reasons for their visit.

Users were uncertain about the value of the analysis tools.

- Generally, respondents who finished the Business Energy analyzer stated that there were *"too many questions, I don't have time for this."* Only one respondent found value in completing all the analyzer questions.

- Non-pilot respondents who visited Usage History stated that they would not take the time to manually enter all their billing information (billing history was loaded into the site for pilot users; non-pilot users do not have billing information available). One or two mentioned that they keep their records separate from their computer, and it would be "too much work" to retrieve the bills and enter in the information. Non-pilot respondents also were not sure that the effort of inputting the data would be worth the benefit of seeing a chart.

- Many users were unable to clearly differentiate between FastTrack and Home Energy Analysis.
  - Users were unsure which particular tool to use (Energy Analysis, Fast Track, Bill Analyzer, and Usage History). Respondents were sometimes unclear of the differences between FastTrack, Energy Analysis (home and business), and My Benchmark.

Customers visited the Web site twice on average, and claim they intend to return.

- According to the user survey, Customers visited California Energy Connection CEC.com two times on average
  - One-third indicated that they visited the Web site only once.

- Most users intend to return.
  - Users intend to explore energy saving tips in a return visit. Users also mentioned using other tools (calculator, bill analyzer, audit) in a return visit. However, many did not notice these tools in their initial visit, suggesting that they were introduced to the tools in completing the user/non-user survey, not during their Web site visit.
  - Business users noted that they might be less likely to return to the site, citing time concerns, as reported in usability testing (Chapter 3)

User satisfaction remained high, but overall impressions are unenthusiastic.

- User satisfaction is relatively high, unchanged from last year. Satisfaction may be related to ease of use; users again found California Energy Connection easy to use.

- Users were less favorably disposed toward California Energy Connection Web site in 2003, although few held a "very unfavorable opinion" of the Web site.

- Residential users who were "somewhat" favorably inclined toward the Web site fell from 63% to 49%, while the number of residential customers who were neither favorably nor unfavorably impressed tripled to nearly 30%.

- These lukewarm overall impressions are reinforced by users' opinions of the usefulness of Web site activities. In particular, one-time visitors rated the usefulness of site activities much lower than last year.

Recent changes to the Web Site did not improve its usefulness.

- Changes to site layout and interface, made in response to Year 1 usability, recommendations, increased the usability of California Energy Connection.

- However, two new areas of the Web site – "My Home Page" and the Bill Analyzer – were not attractive to users.
  - Of the users that noticed these areas, more chose *not* to visit them.
  - Users found these two features to be the hardest to use and were less satisfied with them than any other element of the Web site. Usability results, offered in Chapter 3, confirm these findings .
  - Users did not consider the "My Home Page" feature helpful, according to the quantitative survey.

6.2 EFFECTIVENESS OF CALIFORNIA ENERGY CONNECTION WEB SITE

As was reported in the Program Year 2002 evaluation, there exists 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. The primary component of the Web site likely to generate savings and affect customer behavior is the audit, but several factors limit its effectiveness.

Several factors limit the audit's potential to deliver energy savings.

- Relatively low number of customers completed at least enough of the audit to get energy saving recommendations. Of the 1,336 residential users that registered with the site, only 10% received audit recommendations.

- Although the audit was successful in influencing customers to adopt recommendations, web survey results indicated that some users felt the results were too general and not customized enough.

- Customers reported having already adopted over half of the recommended measures prior to visiting the Web site.

- None of the surveyed customers that received audit recommendations used the rebate finder to obtain an incentive on a purchased product, indicating a lack of linkage between these areas of the Web site.

Most registered users viewed the energy savings tips, but many users had already adopted more than half of the tips before visiting the Web site.

- The Web site is capable of generating significant energy savings and impacting customer behavior through the energy saving tips.

- Three-quarters of the registered users that participated in the quantitative survey reported having viewed these tips (down from 94% in 2002). 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.

- As with the audit recommendations, surveyed users report having already adopted more than half of the savings tips prior to visiting the Web site. Potential savings associated with the tips could be improved by reviewing and revising the list of measures presented.

About 10% of users surveyed said they purchased energy efficient equipment as a result of visiting either the rebate finder, manufacturer links, or product information.

- As with the 2002 evaluation, the site provided information that led to customer adoptions through the rebate finder, product information and manufacturer links.

- However, rebate and product information is helpful to customers who are in the market to purchase energy efficient equipment. Consequently, many users gave their lowest rating to the Web's usefulness in encouraging them to purchase energy efficient products. Both residential and business users believed the Web site to be less "helpful in getting me to make decisions regarding purchasing energy-efficiency equipment," according to the user survey.

The Web site was successful in increasing customer knowledge about energy efficiency and conservation.

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

- 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.

6.3 LESSONS FROM THE BENCHMARKING ASSESSMENT

The California Energy Connection Web site compares very favorably to its peers.

  - The California Energy Connection Web Site has fulfilled its mandate, "to provide residential and small business electricity customers with information and tools to help them analyze and evaluate their electricity usage and issues, effectively reduce their electricity consumption and costs, learn about techniques and products to improve their energy efficiency, understand recent and ongoing changes in the

California electricity market, and get up-to-the-minute news on a range of electricity-related topics."

Results of the benchmarking assessment of competitor sites suggests that the California Energy Connection Web Site could be strengthened by:

- Linking to utility customer information (like PGE.com) to enable customer account management.

- Adding a retail store (or contractor) finder that links consumers directly to stores.
  - Adding a printable checklist that customers can use to gather the information needed from their home or business (i.e. utility bill, thermostat setpoint) in order to complete the survey.
    .. Customers would benefit from this feature because the Nexus California Energy Connection tool require numerous inputs in order to generate detailed outputs.
    .. A printable checklist would serve as a quality control feature and could potentially reduce attrition, as some customers do not complete the survey due to the unexpected data and time demands of the audit tool.

- Informing customers about the time needed to complete the survey and status of the progress towards completion while performing the audit.

- Linking audit recommendations directly to energy efficiency rebate programs.

- Creating a summary list that sorts recommendations by cost-effectiveness and/or highlights key cost-effective measures.

PGE.com and the California Energy Connection Web site are not significantly different.

- Both PG&E.com and California Energy Connection offer the same set of content and features that users found to be the most useful – energy calculators, energy saving tips, product information, rebate information, and usage history.

- Both sites also offer the same Nexus audit products.

California Energy Connection could eliminate duplicative content and analysis tools and instead provide links to the four California IOU Web sites.

- The IOU web sites have the advantage of having access to customer billing data, eliminating the need for customers to enter in this information.

- The IOUs are considered to be a trusted brand and credible information source, helping to increase the likelihood of customers adopting energy efficient measures and practices.
  - A few respondents wondered why "this site isn't part of PG&E."
  - Eleven percent of users found the site through PGE.com.

- Similarly, the IOU Web sites could provide links to unique areas of the California Energy Connection Web site, such as the market information. Or this information could be migrated over to the IOU Web sites, eliminating the need for the California Energy Connection Web site.

6.4 RECOMMENDATIONS FOR WEB SITE ENHANCEMENTS

Finding/ Issue Area	Recommendation
Site Awareness	
Marketing	• Since Mailings are effective at increasing awareness of the California Energy Connection as well as PG&E's sponsorship, continue utilizing this channel for accessing and attracting new users.
Marketing	• 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.
Marketing	• 11% of Non-users were aware but had not accessed the site, so marketing efforts will need to break through the Non-users' attitudinal barrier in order to create interest in using the California Energy Connection Web site.
Marketing	• Since the majority of Non-users mentioned Yahoo! or Google as search engines they would use to find information on energy efficiency, be certain that these search engines cross reference California Energy Connection as a source of information on energy efficiency.
Marketing	• By keeping the site updated with current (seasonal) information as well as new rebates and links to other energy efficiency sites return usage should increase.
Marketing	• Emphasize interactive tools on the Web site to increase their use, either at the initial visit or at a future visit, because users indicated they were interested in these advanced features
Splash Page and Homepage	
Layout/Design	• Consider adding more graphical representation on Splash page that will entice users to enter and explore. Users responded overall to images (including clickable links and images) more than text.
Content	• Consider making the bulleted text in the three modules (Analyze Your Usage, Reduce Usage & Costs, Energy-Saving Products) link to the appropriate tools.
Nomenclature/ Content	• Remove the Quick Find feature: users did not find value in it and were confused about its purpose. To search the site respondents used the Search feature.

Finding/ Issue Area	Recommendation
Registration	
Registration	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. On the intermediary page between the link to a tool and the login page, highlight that registration is only to save (or import) usage data. While this text is present, many users did not read it. • Make the registration process itself easier by eliminating confirmation/activation step. Users do not consider their electric bill "confidential" information enough to merit the extra effort it takes for this added step. To understand the full extent to which users perceive privacy, further quantitative research is needed.
Energy Saving Tips	
Impact/ 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 • Link energy saving tips to relevant rebates and product information
Home/Business Energy Analysis	
Marketing	• Focus efforts on including interactive and customizable tools on the site that incent users to return. Also illustrate examples of savings opportunities by providing examples for how the Web site can provide specific-targeted recommendations based on real-world data. • Highlight areas where user-billing info is automatically imported and how using the tools can help save on energy costs.
Content	• Add a printable checklist that customers can use to gather the information needed about their home or business (i.e. utility bill, thermostat setpoint) in order to complete the survey. Such a checklist would serve as a quality control and potentially reduce user attrition, as some customers do not complete the survey due to unexpected data requirements and time demands of the audit tool.
Content	• Create a summary list that sorts recommendations by cost-effectiveness and/or highlights the most cost-effective measures.
Content	• Present users with more information about the results of the Analyzers before they are asked questions. For example, "What you get" showing potential results may motivate users to use the audits.
Content	• Consider adding a "what you'll need" action list prior to starting these tools. Other Web sites make use of the 'checklist' style to ensure users are fully prepared for the process, providing a more efficient experience overall.
Content	• Bullet the differences between FastTrack and Home Energy Analysis. Users tended not to read the descriptions on the Analyze Your Usage page. • Showing examples of the Savings Options in the Analyze Your Usage page may also help users differentiate between the audits, and entice them to use the tools.

Finding/ Issue Area	Recommendation
Content	• Present users with more information about the results of the Analyzers before they are asked questions. For example, a more apparent illustrative "What you get" showing potential results may motivate users to use the audits.
Content	• Add a link from the Usage History results to the Home Energy Analysis or Business Energy Analysis tools. This would help users understand that the site has additional functionality for providing specific recommendations.
Content	• Include examples of savings opportunities in the description of the Business Energy Analyzer to illustrate the benefits of using the tool.
Content/Usage History	• Inform users upfront that in order to complete the analysis they will need to have past bills handy.
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; users who were presented with pre-filled data liked this feature)
Content/Information Hierarchy	• Include links from the My Benchmark charts to relevant savings opportunities.
Impact /Energy Savings	• Reduce number of recommendations and highlight key recommendations.
Impact/Energy Savings	• Eliminate or de-emphasize recommendations that have negative savings, excessively long payback periods or very small savings
Impact/Energy Savings	• De-emphasize more generic recommendations that are likely to have already been adopted
Layout/Design	• Default the Savings Opportunities/Priorities to Show All, not Quickest Payback.
Design	• Ensure that all options on drop-down menus are visible, unless the list is very long (e.g. Facility Type).
Nomenclature/ Navigation	• Include more descriptors with navigation elements, e.g. "Next: Detailed Analysis."
Nomenclature/Help	• Add a "what's this?" link below each of the questions in the form part of the tools that links to the pop-up help window. This extra call-out may aid users in understanding how to get definitions of the questions or terms in the form.
Product Information	
Content	• Add a retail store (or contractor) finder that links consumers directly to stores
Calculators	
Information hierarchy	• Since users liked the functionality of the calculators, consider bringing them up higher on the products page. Even at higher resolutions the calculator link/icon was below the page fold and respondents did not immediately find it.
Content	• Boldly state on the Fridge Calc that it is intended for the user to specify his/her current refrigerator on the first page of the calculator.

Finding/ Issue Area	Recommendation
Content	• Outline the relationship of the manufacturers with the California Energy Connection Web site. Highlight that the listed manufacturers have energy-efficient products, and are not in a business relationship with the Web site or PG&E in closer proximity to the links. • While a disclaimer exists in the text above the manufacturer's Web site, nearly no respondents noticed it.
My Homepage	
Content	• Clearly highlight on homepage why a visitor should register, and what the benefits are of having a customized Web site. Users need a call to action to take the time to customize Web sites.
Content/ Organization	• Remove the Change Layout/Choose Content links. While users were able to find these links when prompted, most did not notice them upon initial exploration and did not find value in them.
Bill Analyzer	
Information Hierarchy	• Add a link to the Bill Analyzer from the results of the Usage History tool. Users usually visited the Usage History first, and mentioned that it was logical to look at their usage patterns then move on to the Bill Analyzer.
Information Design	• The Bill Analyzer tool should have a table of contents upfront to allow users to a) know how long the whole audit takes, and b) be able to jump to a specific section.
Content	• Inform users of the types of suggestions given by the Bill Analyzer. While users found value in the results, most were not sure what to expect while entering data. • Respondents preferred specific recommendations and information on why specific months might have a particularly high or low energy cost.