2006-2007 FLEX YOUR POWER NOW! EVALUATION REPORT

CALMAC Study ID PGE0255.01

Submitted To:

Demand Response Measurement and Evaluation Committee (DRMEC)

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FINAL REPORT

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EXECUTIVE SUMMARY

Flex Your Power NOW! (FYPN) focuses on achieving voluntary peak demand reductions on days when the California Independent System Operator (CAISO) determines that electricity supply may not be sufficient to meet demand. The campaign uses a mass media implementation strategy to ask Californians to reduce peak electricity use on critical days. Flex Your Power NOW! is cobranded with the broader Flex Your Power (FYP) campaign, which promotes the purchase of energy-efficient appliances and products. Both campaigns are administered by McGuire and Company (formerly Efficiency Partnership). While FYP and FYPN have different goals, the messages were developed in conjunction with each other and are promoted to the same target audience through similar mass media communications channels. The FYP and FYPN campaigns operate across the state of California, spanning the territory of the major investor-owned utilities. Program funding, authorization, and evaluation are covered by the jurisdiction of the California Public Utilities Commission (CPUC). Oversight for this evaluation of FYPN's program years (PY) 2006 and 2007 is provided by the Demand Response Measurement and Evaluation Committee (DRMEC), a statewide committee with representatives from San Diego Gas & Electric (SDG&E), Southern California Edison (SCE), Pacific Gas and Electric (PG&E), the California Energy Commission (CEC), and the CPUC.

The evaluation's research plan was developed by Summit Blue Consulting, LLC and its research partners, Braig Consulting and MoGo Marketing and Media (together referred to as the Summit Blue team), based on an initial kick-off meeting with and input from the DRMEC, as well as the oversight of Tim Caulfield of Equipoise Consulting, the outsourced project manager designated by PG&E. The evaluation approach is consistent with the direction and observations of recent CPUC decisions, which expressed concern about the cost-effectiveness of "generalized advertising efforts like Flex Your Power Now."[1]

The terminology used to identify the program itself and the event days have gone through several iterations through the lifetime of the program. In this report, the program is referred to as Flex Your Power NOW! (FYPN) and the event days are referred to as Flex Alerts.

E.1 Program Objectives

As stated above, Flex Your Power NOW! focuses on achieving voluntary peak demand reductions on days when CAISO determines that there is a potential supply/demand imbalance. These event days are called "Flex Alerts", although the term is not consistently used by the many different entities involved (FYP, CAISO, the IOUs, and the news media). The specific actions promoted include turning off unnecessary lights, setting the thermostat to 78 degrees, and delaying the use of energy-consuming appliances such as dishwashers until after 7 PM. Flex Alerts are typically issued the day before or the day of the possible system emergency, via radio and TV commercials, email "blasts", electronic Amber Alert signs, and increasingly through the news media. The Flex Alerts typically ask Californians to voluntarily reduce their load during the peak hours (2-7 PM) by taking the recommended actions listed above.

There is some disagreement among stakeholders whether the program's primary intent is achieving widespread awareness of the need for peak conservation (with potentially smaller impacts) or achieving the biggest MW reductions on event days (with potentially lower overall awareness, but higher impacts coming from "superconservers"). A review of the authorizing decisions for FYPN revealed an increasing emphasis on achieving cost-effective demand reductions "on targeted summer days when the state has

[1] CPUC Decision 06-04-024, March 15, 2006.

heightened supply/demand balance concerns," and that advertising efforts should focus on "effectively communicating critical information."[2] This indicates that the primary goal of the program is achieving demand reductions on specific days, and that building awareness is important as a mechanism to increase consumers' motivation to conserve during those targeted summer days and to educate them on the desired behaviors. The program implementer's view of the program's intent is consistent with that summary.

E.2 Evaluation Objectives

The Summit Blue team was tasked with the following objectives for the evaluation of the 2006-2007 Flex Your Power NOW! campaign, per the approved research plan.

1. Document the program goals and the implementation strategy for reaching them.
2. Assess customer awareness of and response to the program.
3. Assess how effectively the program was administered and whether the program has caused a reduction in peak load.
4. Provide guidance on whether the program should be continued in the future and, if so, make recommendations for future program design.

E.3 Evaluation Methods

The evaluation methods used included:

- In-depth interviews with program staff (McGuire and Company) and media team (Frasier Communications), and with representatives of the California Independent System Operator (CAISO) and the investor-owned utilities (IOUs).
- Review of program documentation regarding target audience, creative message development, and other program design issues.
- A media purchasing review conducted by MoGo Marketing and Media to assess the program's media campaign planning and purchasing strategies in terms of cost-effectiveness and reach.
- A qualitative review of the promotion and media coverage of the August 2007 Flex Alerts, including close monitoring of information provided on the FYP, IOU, and CAISO websites.
- Focus groups conducted by consumer psychology and marketing specialist Braig Consulting to obtain qualitative reactions to the program concept and messaging from members of the target audience.
- Three major survey efforts to obtain quantitative estimates of customer awareness and response to the program: a baseline survey conducted prior to the 2007 campaign; a post-event survey conducted immediately after the August 2007 Flex Alert event period; and a post-summer survey conducted in late 2007-early 2008.
- Three indirect impact analyses to place bounds on the possible demand response (DR) effects of the FYPN program: examination of CAISO level forecast and actual load data to identify the aggregate demand response on FYPN event days; analysis of baseline and post-event survey responses to estimate the impact from residential air conditioner event response; and econometric analysis of customer-level residential interval load data.

[2] CPUC Decision 06-04-024, March 15, 2006.

E.4 Overarching Themes and Key Findings

A number of overarching themes emerged during the course of the evaluation.

1. All parties interviewed expressed the view that coordination between the program implementer, CAISO, and IOUs has improved significantly from previous years, but there is still room for additional improvement by all parties, particularly in the areas of event notifications and coordination of web-based messaging.
2. Most Californians still have a difficult time understanding that conservation[3] is needed more on some days than others. It appears that the concept of peak usage (relating to a time of day) is better understood than the need for load reduction on specific days. For some, the FYPN messages are interpreted as requesting long-term lifestyle changes, not short-term behaviors to avoid emergencies.
3. Flex Your Power and Flex Your Power NOW! may be *too* closely integrated, contributing to confusion between long-term energy efficiency strategies (such as purchase of energy-efficient appliances) and short-term demand response.
4. Despite this confusion, consumer recall of Flex Alerts increased significantly from 2006 to 2007.
5. The target audience (defined by the larger FYP campaign) may include those most willing to conserve but may not be reaching those who are most willing *and also able* to respond to alerts; generally speaking, someone needs to be home during peak hours to adjust thermostat settings or turn off unneeded lights and appliances.
6. Inconsistent and frequently changing program names and logos contribute to confusion in the marketplace and weaken the FYPN message. Different entities (FYP, CAISO, the IOUs, the media) used a wide variety of names and logos during the August Flex Alert event, including the FYP logo, the old FYPN logo, and the new Flex Alert: Save Energy Now! logo, as well as the phrases "power alert", "power emergency", "electrical emergency", and others.
7. Online advertising, text messaging, email, and other cost-effective social media channels are underutilized and could be better utilized to leverage the media buy.
8. Understanding program cost-effectiveness is complex. The value of the program may extend beyond simple peak load reduction. Political figures have used the program to stress the need for building additional power plants in load constrained areas and at least one Flex Alert day in 2007 was called due to a transmission failure when a plane flew into a power-line tower.

Key findings by topic area are summarized below. Methodologies and full results are presented in the body of the report.

Program Goals and Implementation Strategy

- There does appear to be consensus that the FYPN effort is designed to increase awareness of the need for conservation during peak demand periods; however, there is less consensus on the nuances of program intent. Stakeholders disagree as to whether broad awareness of the program

[3] Responding to the requested actions of Flex Your Power NOW! may not technically be viewed as conservation by many utility professionals due to the snapback phenomenon, however, conservation is how Californians *understand* the request to reduce energy use on particular days at particular times. Focus groups and verbatim responses to survey questions confirmed that consumers use the terms "saving energy", "conserving", etc., when describing the requested actions.

with potentially less demand response impact is preferable to having lower awareness in the general population but higher impacts (coming from those most able to contribute significant demand reduction). The program implementer believes that the primary intent of the program is behavior change on Flex Alert days, but that raising awareness is important also to give Californians the motivation and ability to respond to the alerts.

- There is significant concern about attribution and how to single out the effects of the FYPN advertisements as compared to education about peak pricing. This is especially relevant with rates such as the Peak Time Rebate, which is currently being rolled out in SDG&E territory and seems possible in SCE territory as well.

- The program implementation strategy should continue to strive for earlier upfront notification so that Californians have adequate time to modify their typical daily energy usage. Earlier notification of events to both the implementer and public would help place announcements about alert days in the nightly news, the night before conservation is needed.

- In 2006, FYPN ads only aired on nine out of 15 alert days due to the inflexible terms of the joint FYP/FYPN media buy.

- Designing the program to geotarget messaging could bring in more megawatts in critical areas. Thus on days when San Diego is suffering from unusually high temperatures, but the San Francisco Bay area is temperate, regional calls to action could be issued; similarly seasonal variations could also be accommodated.

- Combining the FYPN media buy with the FYP media buy appears to bring excellent purchased value, but does also limit the market segments that are reached by the ads to those selected as the primary target audience for the FYP campaign.

Customer Awareness and Response

- Both focus group and survey results indicate that the three major requested conservation actions promoted in FYPN messaging (shut off unneeded lights, set thermostat to 78 degrees or higher, and avoid using appliances until after 7 PM) are widely understood and easily recalled. However, most people do not understand that the conservation is requested for particular *days*, not just particular *times of day*.

- Focus group and survey results show that the California pride element of the current TV spots resonates well. There is some confusion about whether the global warming message ("prevent blackouts today and global warming tomorrow") leads Californians to believe that the requested actions are long-term rather than short-term in nature. While raising general awareness of the importance of conserving during peak times is a step in the right direction, it is important that the alerts convey that conservation is especially important *today* (i.e., the day of the Flex Alert itself).

- Using a similar program name and a modified version of the FYP logo as the FYPN logo may contribute to the undesired effect of having Californians think FYPN is an "everyday" message, in that it appears so similar to the FYP logo that appears on television ads, bill inserts, and many other IOU-customer interactions year-round. Note that the program name and logo was changed for the 2007 season, although similarities between the FYP logo and the new Flex Alert logo remain and some stakeholders used the older logo styling in their messaging.

- Survey data show that 23% of Californians recalled seeing an energy conservation alert before summer 2007 (the term Flex Alert was not used consistently prior to 2007), and 34% recalled a Flex Alert or energy conservation alert based on post-summer surveying. Most commonly, Californians report seeing or hearing about the alert on television (75%), followed by radio (33%), newspaper (18%), websites (8%), and email (4%), based on post-summer surveying.[4]

- The majority of people who see an alert do conserve energy in response. Nearly two-thirds of both baseline survey respondents (63%) and post-summer survey respondents (64%) who recalled an alert reported taking action in response to the alert. Post-summer survey data indicate that renters are more likely to respond to alerts than homeowners; 74% of renters who saw an alert took conservation actions in response, compared to 61% of homeowners.

Effectiveness of Implementation Strategy and Likely Impacts

- Air time during broadly appealing summer television programs such as sporting events (e.g., Wimbledon, World Cup, All Star Game) and first-run cable programming was not purchased and could improve summer messaging reach. Many of the programs identified as high priority for the advertising (based on popularity with the target audience), such as Grey's Anatomy and CSI, would be in reruns during the summer season.

- In order to respond to a request for conservation, Californians may need to be at home or able to reach those in their homes (e.g., by phone) during the requested time period. Since the value-driven purchase of the FYPN media buy derives from the FYP purchase, the target audience is not focused solely on those that are home and able to receive the call to action during the peak hours in the afternoon.

- Analysis of the difference between CAISO forecasted and actual load data on both non-event days and Flex Alert days indicated that total system-wide demand response on Flex Alert days (including the effects of all DR programs) ranges from 200 to 1100 MW. Therefore, the indirect impact of FYPN would likely be some fraction of this estimated aggregate impact. See Section 5.0 for further discussion.

Recommendations for Future Program Design

As discussed above, consumers report increased awareness of Flex Alerts and the requested conservation behaviors, and the majority of consumers who recall an alert report taking action in response to the alert. These achievements are especially notable when viewed through the lens of the high cost of media in California and the fact that energy and the environment remain low-intensity issues (often subservient to more pressing issues such as the economy[5]). Despite these positive findings, Summit Blue identified several areas of potential improvement for future program design:

- In the future, the program could be designed to generate larger impacts in areas that are particularly load constrained, using advanced geotargeting techniques with online advertising and

[4] Note that respondents may be recalling newspaper, TV, or radio *news stories* regarding the Flex Alert event as well as *paid* FYPN advertisements.

[5] A recent Gallup poll found that the percentage of Americans favoring environmental protection over economic growth has dropped significantly as fears of recession loom. http://www.gallup.com/poll/105715/Half-Public-Favors-Environment-Over-Growth.aspx.

cable networks. By focusing on constrained areas, additional value could be generated by the program.

- It may be more effective to expand the target audience for FYPN to include those that are home during the day and able to reduce electrical demand. For instance, according to the California Statewide Residential Appliance Saturation Study, a significantly higher percentage of households which include children and/or senior citizens use electrical appliances during peak times than homes without children or seniors.

- Television ads must continue to emphasize that conservation is particularly needed *today* (i.e., the day of the Flex Alert itself).

- During the media purchasing negotiations, additional premiums associated with being able to switch out ads more quickly should be considered to ensure that ads run on all Flex Alert days.

- Future program design must consider and address the possibility of message confusion with the advent of Peak Time Rebate type rates.

- The program should work to improve and increase social media efforts to leverage the large media presence. As an example, text message subscribers on the FYPN site did not receive any Flex Alert announcements, possibly leading to feelings of disenfranchisement. Being able to use the site to forward the message to friends was a program improvement in 2007.

- The use of electronic outdoor media (such as Amber Alert road signs) should be favored over static outdoor media (i.e., traditional billboards) so that messaging conveys the immediacy of the call to action in the Flex Alerts. However, in areas that are load constrained, traditional billboards, though imperfect, may be cost-effective.

- Website coordination between FYPN, CAISO, and the IOUs must increase. Announcements of Flex Alert days by IOU websites should match actual alert days, and FYPN, the IOUs, and CAISO should be willing to link to each other's websites. CAISO website should include links to more information on energy conservation (e.g., on the fypower.org website), as many of the news media website referrers readers to the CAISO website rather than FYPower.org or the IOUs' sites. Web statistics analyzing referral pages and click-throughs should be tracked in detail and reported in future years.

- Additional local news media outreach should occur prior to the summer season so that FYPN graphic elements and specific talking points are prepared, thereby reducing confusion about "electrical emergencies" and other phrases inconsistent with the empowering message of the FYPN campaign.

- Community action kits and plans could be created to assist in getting the word out. Partnering with local governments would be a potentially useful strategy. Note that this would not be inconsistent with the first filed advice letter for the program, which recommended grassroots activism coupled with a statewide media umbrella. Forming partnerships with local schools and rec centers could assist in reaching parents on Flex Alert days at an ideal point in time, as they pick their children up from school in the afternoon or from summer activities.

- Focus group results were consistent with survey data indicating that both the state and utilities are perceived as appropriate and important leaders in this effort. Other necessary messaging is competing with FYPN: messaging about cooling centers for the elderly and infirm and Spare the

Air pollution advisories both typically occur during FYPN events. Coordination between these efforts does occur but increased coordination could improve each effort's reach.

E.5 Recommendations for Future Research

The following bullets present some of the key research questions to consider for the 2008 evaluation, based on findings from the PY 2006-2007 evaluation.

- How effective was the **implementation strategy**?
  - Were recommendations from the PY 2006-2007 evaluation regarding *media planning and purchasing* put into effect?
  - Were recommendations from the PY 2006-2007 evaluation regarding the use of cost-effective *social media leverage strategies* put into effect?[6]
  - Were recommendations from the PY 2006-2007 evaluation regarding *geotargeting* in critical regions put into effect?
- How effective is the campaign at increasing **customer awareness**?
  - Is the *target audience* properly defined? Are the customers most *likely and able* to respond to alerts being reached at the proper time? This builds on previous findings that segmentation strategies should be reconsidered.
  - How effectively is the program targeting *small business customers*?
  - Has *consumer awareness* increased since the 2007 campaign?
- How do customers respond to the **new creative strategy** of the 2008 ads and alerts? Are they more or less effective than the previous ads?
  - Do customers understand the *time-specificity* of the message? Do they understand that behaviors are requested not just for a specific time of day but also a specific day (today)?
  - How *motivating* are the messages? Do customers respond more to the global warming/environmental message or to the California pride appeal (if retained)?
  - Are the messages sufficiently distinguishable from the more general energy efficiency messaging of the FYP campaign?
- What estimates can be made from **customer behavior**?[7]
  - What *conservation actions* are customers taking, and when?
  - How are members of the target audience *seeking and sharing information* on Flex Alert days?
- What are the key **barriers to participation** or message compliance?
- How is the program interacting with other demand response and real-time pricing programs?

[6] The 2007 campaign used a "tell a friend" email strategy that differed from the earlier email notification efforts. Options were also provided in 2007 to receive a text message to the phone. This research would evaluate these strategies and recommend improvements.

[7] Promising avenues of further research into the program impacts include: detailed econometric analysis of all DR events called on all days; expanded analysis of residential customer survey data to include actions beyond air conditioning setbacks; and development of improved forecast models for aggregate and individual analyses of residential interval load data. See Section for more detailed recommendations for further impact analysis research.

1. INTRODUCTION

1.1 Program Description

Flex Your Power NOW! (FYPN) focuses on achieving voluntary peak demand reductions on days when the California Independent System Operator (CAISO) determines that electricity supply may not be sufficient to meet demand. The campaign uses a mass media implementation strategy to ask Californians to reduce peak electricity use on critical days. Flex Your Power NOW! is cobranded with the broader Flex Your Power (FYP) campaign, which promotes the purchase of energy-efficient appliances and products. Both campaigns are administered by McGuire and Company (formerly Efficiency Partnership). While FYP and FYPN have different goals, the messages were developed in conjunction with each other and are promoted to the same target audience through similar mass media communications channels. The FYP and FYPN campaigns operate across the state of California, spanning the territory of the major investor-owned utilities. Program funding, authorization, and evaluation are covered by the jurisdiction of the California Public Utilities Commission (CPUC). Oversight for this evaluation of FYPN's program years 2006 and 2007 is provided by the Demand Response Measurement and Evaluation Committee (DRMEC), a statewide committee with representatives from San Diego Gas & Electric (SDG&E), Southern California Edison (SCE), Pacific Gas and Electric (PG&E), the California Energy Commission (CEC), and the CPUC.

The Flex Your Power NOW! campaign is designed to build awareness of energy saving/shifting actions that one can take during hot summer afternoons and particularly when a Flex Alert is called. The specific actions promoted include turning off unnecessary lights, setting the thermostat to 78 degrees, and delaying the use of energy-consuming appliances such as dishwashers until after 7 PM. Advertisements are run on the radio, TV, newspapers, billboards, ethnic media outlets, and online. A Flex Alert is issued when CAISO officials decide that there is a danger that the demand for electricity could outstrip supply on a particular day, possibly leading to brown-outs. Flex Alerts are typically issued the day before or the day of the possible system emergency, via radio and TV commercials, email "blasts", electronic Amber Alert signs, and increasingly through the news media. The Flex Alerts typically ask Californians to voluntarily reduce their load during the peak hours (2-7 PM) by taking the recommended actions listed above.

The terminology used to identify the program itself and the event days have gone through several iterations through the lifetime of the program. In this report, the program is referred to as Flex Your Power NOW! (FYPN) and the event days are referred to as Flex Alerts.

1.2 Evaluation Objectives

The evaluation's research plan was developed by Summit Blue Consulting, LLC and its research partners, Braig Consulting and MoGo Marketing and Media (together referred to as the Summit Blue team), based on an initial kick-off meeting with and input from the DRMEC, as well as the oversight of Tim Caulfield of Equipoise Consulting, the outsourced project manager designated by PG&E. The evaluation approach is consistent with the direction and observations of recent CPUC decisions, which expressed concern about the cost-effectiveness of "generalized advertising efforts like Flex Your Power Now."[8]

[8] CPUC Decision 06-04-024, March 15, 2006.

The Summit Blue team was tasked with the following objectives for the evaluation of the 2006-2007 Flex Your Power NOW! campaign, per the approved research plan.

1. Document the program goals and the implementation strategy for reaching them.

2. Assess customer awareness of and response to the program.

3. Assess how effectively the program was administered and whether the program has caused a reduction in peak load.

4. Provide guidance on whether the program should be continued in the future and, if so, make recommendations for future program design.

1.3 Organization of Report

The remainder of this section focuses on the program background and history. **Section** : **Methodology** presents a brief overview of the specific research tasks undertaken in this evaluation study.

The remainder of the report is organized around the four major evaluation objectives outlined in Section :

- **Section : Program Goals and Implementation Strategy** focuses on the assessment of program goals and implementation strategies, including the results of program staff interviews, interviews with representatives of the investor-owned utilities (IOUs), and the media purchasing review.

- **Section : Customer Awareness and Response** focuses on the qualitative assessment of customer awareness of and response to the program, including the results of the focus groups and the survey efforts.

- **Section : Indirect Impact Analysis** focuses on the quantification of program impacts in terms of a reduction in peak load.

- Finally, **Section 6: Conclusions and Recommendations** summarizes the evaluation's key findings and provides recommendations for future program design.

There is a large amount of information presented in this report. More detailed conclusions on each thematic area of evaluation (Program Goals and Implementation, Customer Awareness and Response, and Impact Analysis) are presented in the conclusions of their respective sections in the report. Overarching themes and major conclusions and recommendations are presented in Section .

Appendices include the focus group discussion guide, survey instruments, tabulations of all survey responses, and supplemental information related to the impact analysis.

1.4 Program Background

This section provides an overview of the history of the Flex Your Power NOW! program, including the program's regulatory context, descriptions and screenshots of the television ads used in 2006 and 2007, the dates of Flex Alert events in 2006 and 2007, and a description of the program's target audience.

1.4.1 Regulatory Context

The recent regulatory context for Flex Your Power NOW! was reviewed to provide insight into program goals. Table - presents a brief overview of the CPUC record regarding the authorization and evolution of the FYPN campaign.

Table -. CPUC Decisions and Utility Advice Letters Regarding Flex Your Power NOW!

Date	Document	Relevance
June 4, 2004	Assigned Commissioner Ruling (ACR) in R.02-06-001	Invites utilities to submit Advice Letters describing programs to address potential supply shortages that summer: "I invite, but do not require, all three utilities to submit advice letters within five business days of this ruling to implement programs that achieve demand response through Advanced Load Control (as proposed by Southern California Edison Company (SCE)) and expansion of Smart Thermostat programs (as proposed by SCE and San Diego Gas & Electric Company). … In addition, the utilities should include in their advice letters all of the details necessary for a full evaluation of the program design, including strategies for marketing and roll-out, technology specifications, ***and detailed cost information,*** at a minimum." (emphasis added)
June 8, 2004	Advice Letter 1804-E. Proposal of Southern California Edison Company to Mitigate Peak Demand During Summer 2004 by Reopening Schedule 20/20 for Commercial and Industrial Customers on Time-of-Use Rate Schedules, Expanding the AB 970 Smart Thermostat Program and Increasing Enrollment in the Residential Air Conditioning Load Control Program	"In order to help avoid the potential supply shortage issues discussed in this filing, SCE intends to conduct an integrated outreach campaign to reach its very diverse customer base. The purpose of the campaign is twofold: (1) build participation in the proposed Smart Thermostat Program expansion, 20/20 Rebate Program, and ACCP expansion; and ***(2) create demand reduction by raising general customer awareness of the need to conserve energy during peak periods"*** (emphasis added). Mass media costs for this campaign were to cap at $1.85 million and were to be used for "an integrated outreach campaign to build participation in SCE's load control programs for the summer of 2004, and [to] raise customer awareness of the need to conserve energy during periods of peak electricity usage."
June 14, 2004	Advice Letter 2523-E PG&E[9]	Advice Letter responds to ACR of June 4, 2004, requesting $2 million dollars in funding for "Power Down" to be recovered from the Advanced Metering and Demand Response Account. The campaign is to be based on Spare the Air campaign and is described as ***an "awareness campaign to encourage customers to voluntarily reduce energy consumption during summer peak periods***."
July 8, 2004	The Commission issued Resolution E-3879	In the Resolution, the Commission approved SCE's three load control proposals for the summer of 2004, and approved SCE's Mass Media Campaign Memorandum Account (MMCMA) related proposals.
July 8, 2004	Resolution E-3882. Pacific Gas & Electric Company (PG&E) for approval of Adoption of Proposed Summer Demand Response Reduction Programs in Response to Assigned Commissioner's Ruling on June 4, 2004	Program is described as "***an awareness campaign to encourage customers to voluntarily reduce energy consumptions during critical summer peak periods.*** This program will compliment the State's "Flex Your Power" program and will be modeled after the "Spare the Air" statewide air pollution campaign to reduce peak usage during certain summer days." Discussion indicates that the ***program is expected to reduce peak demand; however, no specific megawatt target was set or estimated***. Finding #10 indicates that "***Power Down shall be subject to the same monitoring and evaluation as other existing demand response programs.*** The Working Group is directed to include the program for M&E.

[9] Advice Letter not reviewed. Summary based on Approval issued in Resolution E-3882.

Date	Document	Relevance
July 12, 2004	Advice Letter 1597-E, SDG&E	SDG&E proposed the Power Down Program to reduce peak usage. The program was to partner with FYP to develop a grassroots media campaign and was to include government entities and customer groups. The program was to be generally based on the Spare the Air campaign and ***was to provide targeted messages to "customers" regarding ways to reduce peak usage and save money***.
August 19, 2004	Resolution E-3886. San Diego Gas & Electric Company (SDG&E) for Approval to Adopt Proposal for a Summer 2004 Demand Reduction Program	Discussion on the issue indicated that Energy Division's original recommendation that SDG&E's proposal be denied was ***"driven by the lack of a cost-effectiveness*** showing in SDG&E's proposal," amongst other reasons. The Energy Action Plan was cited as authority for this proposition. (The "Energy Division recognizes that cost-effective programs that reduce peak demand are a key component of meeting the commission's objectives in the Energy Action Plan.") Additional circumstances persuaded the Energy Division to ultimately support SDG&E's proposal, namely the stated importance of continuing the "Flex Your Power Now effort as underway at PG&E and SCE, the desirability of a consistent program, proof that the program could be timely implemented. Furthermore the general showing that the cost of rotating outage ($12 million) would be greater than the $500,000 requested in Advice Letter 1597-E was also deemed persuasive. The Commission stated general support for cost-effective demand reduction. Thus the implication is that some threshold showing of cost-effectiveness is required.
January 27, 2005	CPUC Decision 05-01-056	Approves FYPN for 2005. All three utilities participated in 2004 in an existing statewide marketing campaign targeted to all customers using radio, print, website, email, and various written material to encourage customers to reduce demand, and to explain how to reduce demand, ***on days when supply is particularly tight.*** The program was to be operated by the Department of Consumer Affairs. "Between the three utilities they propose to contribute an additional $7.3 million to expand the effort for 2005 [a total of $4.3 million was authorized from demand response budgets in response to utility Advice Letters filed in June 2004] and include demand response messaging. ***There are no estimates on potential MW savings in 2004 or for 2005 because attribution of demand response to media campaigns is difficult and very expensive."*** States as a conclusion of law that some budget should be directed towards messages to reflect ***concerns about reliability for Summer 2005*** and ***the importance of reducing energy use during critical peak periods.***
February 28, 2005	Advice Letter 1873E. Recovery of Amounts Recorded in the Mass Media Campaign Memorandum Account	In accordance with Resolution E-3879 Southern California Edison Company (SCE) hereby submits a request for recovery of costs recorded in its MMCMA. Invoices from McGuire and Company indicate $2.9 million in expenditures to be split evenly with PG&E per agreement. Expenditures submitted are predominantly for media support ($2.4 million for radio and $0.47 million for newspaper) with substantially smaller amounts for outreach, staffing, and website and educational materials**.**
March 15, 2006	CPUC Decision 06-03-024 Adopting Settlement:	The decision emphasizes the need for cost-effective programs. "In the case of other programs, the utilities are unlikely to ever be able to demonstrate any benefit. ***We are especially concerned about generalized advertising, such as that provided by Flex Your Power Now, … We do, however, expect the utilities to carefully evaluate these programs from the standpoint of effectively communicating critical information and to terminate those that do not produce results."*** In this decision the primary goal of FYPN is "to reduce peak period usage during targeted summer days when the State has heightened supply/demand balance concerns." And it is targeted at all customers, including residential and small business customers, and relies heavily upon mass media announcements during those targeted summer days.

The summary shows that FYPN was first funded through a series of individual advice letter filings by the utilities in response to an Assigned Commissioner Ruling expressing concern about supply shortages for the summer of 2004. The original proposal by PG&E was for a program entitled "Power Down". SDG&E's proposal was originally rejected, in part for lack of cost-effectiveness, however was subsequently authorized due to a showing that the costs of rolling outages in the region could be expected to greatly outweigh the requested media funding. The early advice letters describe a program that will:

- Create demand reduction by raising general customer awareness of the need to conserve energy during peak periods (SCE).
- Be an awareness campaign to encourage customers to voluntarily reduce energy consumption during critical summer peak periods (PG&E).
- Partner with Flex Your Power to develop a grassroots media campaign and to provide targeted messages to customers regarding ways to reduce peak usage and save money (SDG&E).

A later decision, D.05-01-056 states as a conclusion of law: "*The utility proposed budgets for Flex Your Power Now! should be approved and some portion of that funding should be directed toward messages about the importance of reducing load during critical peak days for summer 2005*." This could be interpreted to mean that only one of the program goals in 2005 was messaging about peak load as other efforts are contemplated; the decision continued on state that "*educating customers about the new [default peak] rates and implications is increasingly important*."

An increasing *emphasis on cost-effectiveness* is observed in the March 15, 2006 Decision 06-04-024, which authorizes FYPN implementation for PY 2006. The decision states, "We are especially concerned about generalized advertising, such as that provided by Flex Your Power Now…We do…expect the utilities to carefully evaluate these programs from the standpoint of communicating critical information and to *terminate those that do not produce results"* [emphasis added]. The 2006 decision describes a FYPN program with the primary goal of *reducing peak period usage during targeted summer days* when the state has heightened supply/demand balance concerns. The program description goes on to state that FYPN is *targeted at all customers*, including residential and small business customers, and relies heavily upon *mass media announcements during those targeted summer days.*

1.4.2 2006 Campaign

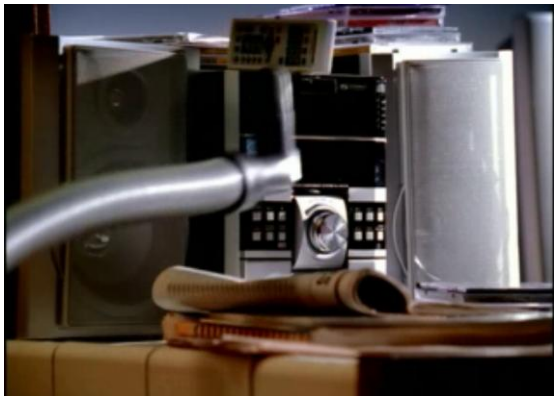
The 2006 Flex Your Power NOW! campaign used the following logo for its communications:

Message Tone and Content in 2006 Ads

There were three TV ads created for the 2006 Flex Your Power NOW! campaign: an education spot, an alert, and a thank-you message. It is reported that only the main alert message and the thank-you were

aired; the education spot was never aired in 2006.[10] Each ad featured an anthropomorphic vacuum cleaner comically fumbling about the house trying to shut off lights and appliances to conserve and finally collapsing when the power goes out, with a newscast on the TV in the background. The content of the newscast varies by ad.

In the education spot (not aired), the newscaster discusses the possibility of a Flex Alert and what to do if one is called.



In the alert itself (aired on the day of the Flex Alert), the newscaster states that a Flex Alert is in effect and a voiceover and scrolling subtitles explain the three major actions to take (turn off unnecessary lights, use appliances after 7 PM, set A/C to 78 degrees).

[10] The *Flex Your Power Campaign Impact Study 2006* presentation given on May 15, 2007 indicated that the education spot was never aired.

In the thank-you message (aired after the alert has ended), the newscaster begins with the statement that a Flex Alert is in effect and then is interrupted and says that the Flex Alert is canceled, because "you flexed your power – but don't stop saving energy, because energy can't save itself."

Alerts in 2006

According to 2006 press releases archived on the CAISO website, "Flex Your Power NOW! PowerWatch Days" were declared for June 22-28, July 14-19, and July 21-24. However, the television advertising (alerts and thank-you messages) were only aired during the July events. Table - summarizes the FYPN events called in 2006, including the forecasted and actual peak demand.

Table -. 2006 FYPN Events

Date	Location	Forecasted Peak Demand (MW)	Actual Peak Demand (MW)
June 22, 2006	Statewide	42,300 MW	40,561 MW
June 23, 2006	Statewide	44,000 MW	42,355 MW
June 24, 2006	Statewide	40,000 MW	42,210 MW
June 25, 2006	Statewide	44,000 MW	37,678 MW
June 26, 2006	Statewide	45,907 MW	38,713 MW
June 27, 2006	Statewide	43,741 MW	43,062 MW
June 28, 2006	Statewide	41,950 MW	40,433 MW
July 14, 2006	Statewide	46,283 MW	44,384 MW
July 15, 2006	Statewide	42,000 MW	42,883 MW
July 16, 2006	Statewide	42,000 MW	41,875 MW
July 17, 2006	Statewide	46,499 MW	46,499 MW
July 18, 2006	Statewide	47,049 MW	46,373 MW
July 19, 2006	Statewide	46,604 MW	45,812 MW
July 21, 2006	Statewide	47,087 MW	49,036 MW
July 22, 2006	Statewide	44,000 MW	48,490 MW
July 23, 2006	Statewide	44,000 MW	45,765 MW
July 24, 2006	Statewide	52,336 MW	50,270 MW
July 25, 2006	Statewide	50,221 MW	49,762 MW

Note: Reason for alert for all events was "Extended heat wave, high forecasted demand."

Source: http://www.fypower.org/flexalert/now_events.html.

1.4.3 2007 Campaign

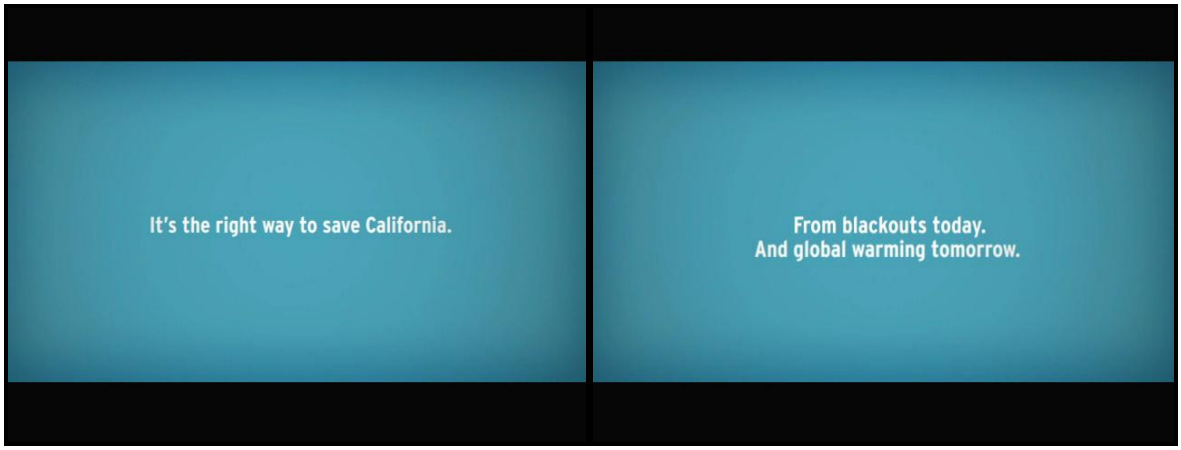
In 2007, the phrase "Flex Your Power NOW!" was officially dropped[11] in favor of the new tagline "Flex Alert: Save Energy Now!" and a new logo:

[11] This change was in response to the previous evaluation of FYPN conducted by Opinion Dynamics Corporation, which found that the similarities between Flex Your Power and Flex Your Power NOW! were too confusing and consumers had difficulty distinguishing between the two terms.

Message Tone and Content in 2007 Ads

The TV ads broadcast in 2007 had a very different look and feel than the 2006 ads. There were three different TV spots: a brief alert, an extended alert, and a thank-you/education message. All three ads featured a series of words and/or icons over a solid colored background, with a solemn announcer's voice doing a voiceover. The two alert messages (aired on the day of the Flex Alerts) had a red background; the thank-you/education message (aired after the Flex Alert is ended) had a blue background.

The text of the blue thank-you/education ads reads, "During hot weather, we all know how important it is to conserve energy. That's why Californians should take pride for saving so much electricity during power shortages. Of course, officials could still call a Flex Alert. If they do, start saving energy immediately. It's the right way to save California from blackouts today and global warming tomorrow."



Alerts in 2007

CAISO issued six "Flex Alerts" in 2007, for July 3-5 and August 29-31. The need for a Flex Alert in July was partially due to a transmission line problem when a small plane crashed into a tower in the San Diego area. During the unexpected event over the 4th of July week, radio ads were placed on KGO and web postings were placed on KGO and KSFO radio in San Francisco. Television ads announcing the alerts were limited to the August event.

1.4.4 Target Audience

According to documents provided by McGuire and Company on the target audience composition, the target audience for the Flex Your Power campaign (and by extension the Flex Your Power NOW!

campaign, since the media buys are linked) was determined by analyzing the demographics of people who replied favorably to the following statements:

- "I am willing to give up convenience in return for a product that is environmentally safe."
- "I have participated in environmental groups or causes."
- "I regularly recycle."
- "I believe that preserving the environment and helping to preserve nature is very important."

This target audience consists of adults, skewed towards women, over 35 years old who tend to be pro-environment, own their own homes, be married, and have higher income and education levels. In terms of a media buy, this target audience translates to adults 35-64 years old.

The campaign is statewide, although resources are focused primarily in the major metropolitan areas of San Diego, Los Angeles, Sacramento, and San Francisco.

2. METHODOLOGY

Summit Blue undertook a variety of research activities to achieve the four evaluation objectives (discussed in Section).

2.1 Overview of Methodology

Research activities related to the goal of **documenting program goals and assessing the effectiveness of implementation strategies** included:

- **In-depth interviews with program staff (McGuire and Company) and media team (Frasier Communications)**. Senior utility representatives were also interviewed regarding program goals and implementation experiences. Additional interviews were conducted with personnel from the California Independent System Operator (CAISO).
- **Review of program documentation** regarding target audience, creative message development, and other program design issues.
- **A media purchasing review** conducted by MoGo Marketing and Media to assess the program's media campaign planning and purchasing strategies in terms of cost-effectiveness and reach. MoGo has conducted purchasing analyses for other social marketing efforts, including the Spare the Air campaign in the Bay Area.
- **A qualitative review of the promotion and media coverage** of the August 2007 Flex Alerts, including close monitoring of information provided on the FYP, IOU, and CAISO websites.

Research activities related to the **assessment of customer awareness of and response to the program** include:

- **Focus groups** conducted by consumer psychology and market specialist Braig Consulting to obtain qualitative reactions to the program concept and messaging from members of the target audience.
- **Three major survey efforts** to obtain quantitative estimates of customer awareness and response to the program:
    - A **baseline survey** to measure existing levels of awareness and recall of FYP, FYPN, and Flex Alert messaging, as well as actions taken in response to energy conservation alerts seen in previous years. In addition, the baseline survey collected data on consumer media habits, appliance usage habits, demographics, and attitudes regarding environmental and social issues.
    - A quick-turnaround **post-event survey** to measure recall of the August 2007 Flex Alert event and conservation actions taken.
    - A **post-summer survey** to measure changes in awareness and recall of FYP, FYPN, and Flex Alert messaging as compared to the baseline survey, as well as actions taken in response to alerts seen during summer 2007. As with the baseline survey, the post-summer survey collected data on appliance usage habits, demographics, and attitudes regarding environmental and social issues.

Research activities related to the assessment of whether the program has caused **a reduction in peak load** included three impact analyses:

- Examination of California Independent System Operator (CAISO) level forecast and actual load data to identify the aggregate demand response on FYPN event days.
- Analysis of baseline and post-event survey responses to estimate the indirect impact from residential air conditioner event response.
- Econometric analysis of customer-level residential interval load data.

2.2 Focus Groups Methodology

Summit Blue collaborated with Braig Consulting for their expert consumer psychology and marketing qualifications to conduct three focus groups in California on June 12-14, 2007, as part of the larger Flex Your Power NOW! evaluation efforts. The overall goals of the focus groups were to get a qualitative read on consumer opinions of the FYPN advertisements from 2006 and the recently completed 2007 spots. Specific objectives included:

- Message comprehension of FYPN advertisements (2006 and 2007).
- Appropriateness of the tone of the communications.
- Assess attitudes toward the FYPN concept including beliefs about importance, benefits to themselves and beyond, barriers to compliance, and potential motivations to participate.
- Provide some qualitative insight into the appropriateness of media vehicles for the FYPN alerts.

The focus groups were not used to measure awareness of FYPN, but rather to gain a richer sense of knowledge of and response to the FYPN program, and to provide context for the results of the quantitative survey efforts that followed. Responses to FYPN ads were examined in the form of attitudes and self-reported behaviors. The focus group discussion guide is included as an attachment to this report in Section .

One 2-hour focus group was conducted in each of three cities: Los Angeles, San Diego, and San Francisco on June 12th, 13th, and 14th respectively. A research facility located appropriate respondents from their database with the goal of having six people in each group. The final participation rates of 4-6 were consistent with industry norms.

Each group was recruited for a mix of men and women aged 35-49, with a slight skew toward females based on prior research suggesting greater FYPN participation rates for women. All respondents owned their home and had a household income of at least $75,000, reflecting upper middle-class homes and above. The majority of respondents had central air conditioning or at least a window unit. Finally, all respondents had to exhibit a certain predilection to engage in conservation behaviors based on agreement with environmental-related statements provided by Summit Blue from previous research on the stated target audience for the FYPN media pieces.

Although several consistent themes arose as a result of the three focus groups, it must be emphasized that the results are *qualitative*. As such the goal was to obtain a qualitative read or gist of responses to the FYPN ads and concept.

2.3 Survey Methodology

Three major survey efforts were fielded to obtain quantitative estimates of customer awareness and response to the program:

- The **baseline survey** was conducted via both telephone and web[12] between May 22nd and June 29th, 2007. The telephone surveys were conducted by Opinion Research Northwest (formerly Northwest Research Group), which obtained 1122 completes; the web surveys were conducted by Vovici and obtained 1260 completes.
- The **post-event survey** was conducted via telephone by Opinion Research Northwest. The survey was fielded between August 30th and September 9th, 2007, and resulted in 613 completes.[13]
- The **post-summer survey** was conducted via telephone by Opinion Research Northwest. The survey was fielded between December 22nd, 2007 and January 18th, 2008, and resulted in 1217 completes.[14]

2.3.1 Sample and Survey Design

The sampling plans for each survey effort were designed to have quotas in each designated market area (DMA) that were large enough to obtain statistically valid results in each region.[15] The minimum sample size per DMA that would provide statistically valid results at the 90% confidence level (based on a binomial distribution and assuming the largest variance in response) was calculated to be 67. Thus, the sampling plans were designed with minimum sample sizes of 67 respondents for the smallest DMAs and the larger DMAs having larger samples roughly corresponding with their larger populations.[16] The total target sample size for the baseline and post-summer surveys was 1200 completes; for the post-event survey, which required a quicker turn-around, the total sample size was 600 completes.

Each survey was translated into Spanish so respondents had the option of completing the survey in either English or Spanish. The baseline survey instrument was a modification of the baseline survey fielded by Opinion Dynamics Corporation (ODC) in November 2005 as part of a previous evaluation of FYPN. The

[12] In the final March 29, 2007 workplan, Summit Blue indicated that if the web and phone surveys had good comparability, post-event surveys would be conducted by web, as web surveying is somewhat more cost-effective. If, however, the results differed, the post-event surveys would be conducted by phone, to better facilitate comparison to previous evaluation surveys which were also conducted by phone. Summit Blue found meaningful and statistically significant differences between the results of the phone and web baseline surveys; thus, subsequent survey efforts were conducted by telephone.

[13] The post-event survey was fielded immediately after the Flex Alert was announced and the majority of responses were collected during the first four days following the event, but due to the Labor Day long weekend, the data collection period was extended to obtain the required number of completes. There was no significant observed decline in alert recall levels or conservation activity based on survey completion date.

[14] The long fielding time for the post-summer survey was due to the difficulty of reaching respondents during the holiday season.

[15] It is important to recognize that each question in a survey will produce a set of answers that will have its own mean and variance and, therefore, each question will have different levels of confidence and precision. This is a common problem in all survey research.

[16] Minimum sample sizes for the smaller DMAs had to be reduced in the web survey due to the fact that the web survey uses a recruited panel; there simply were not enough panelists in some of the smaller DMAs.

post-event survey was modified from a previous post-event survey conducted by Glacier Consulting Group during summer 2006; modifications to the instrument were informed by findings from the focus group which indicated that respondents were interpreting the FYPN messages as asking for long-term lifestyle changes rather than short-term emergency behaviors. The post-summer survey instrument was further modified from the baseline survey instrument based on findings from the previous evaluation activities; baseline survey questions that were not expected to change over time (e.g., media usage habits) and that did not provide useful cross-tabulations were removed from the post-summer survey.

2.3.2 Data Collection Quality Control

For the telephone surveys, Opinion Research Northwest utilized the Sawtooth Software's **Ci3 CATI** (Computer Assisted Telephone Interviewing) for data collection and sample management. The questionnaire and accompanying logic program were entered into a computer program. Interviewers then read the questionnaire directly from the computer screen and entered the data directly into a data file. Interviewers keyed data for closed-response questions directly into the computer as respondents answered each question. The questionnaire programming automatically controlled out-of-range responses. Interviewers typed in verbatim responses to questions with an "other" category. All interviewers assigned to the project attended a project briefing / training session. The sessions included the purpose of the study, a discussion of issues and technical information specific to the study, and a question-by-question analysis.

Opinion Research Northwest's Project Managers and Field Services Managers continually monitored data collection. Daily interviewing was supervised with a supervisor to interviewer ratio of 1:8. Each interviewer was monitored through a complete interview at least once every shift. As part of the monitoring process, supervisors completed a question-by-question analysis of the interview and reviewed the call with the interviewer. A supervisor was immediately available to handle any questions that arose during an interview. Call records and the data were reviewed daily to ensure that sample specifications were met and data quality was maintained.

All sampling and call management, including scheduling of callbacks, call dispositions, quota controls, etc. was handled by Opinion Research Northwest's Ci3 CATI networked system. Opinion Research Northwest employed the following methods of contact and dialing protocol:

- Calling hours on weekdays were from 4 p.m. to 9 p.m., and weekends from1 p.m. to 9 p.m., local time.
- Numbers which had scheduled callbacks were given precedence in the sample.
- For each number dialed, interviewers reviewed a complete call history that detailed the number of attempts made to a particular number and the status of the last attempt.
- Busy numbers were kept in the active queue and retried within 10 minutes of the first dialing.
- Numbers with a respondent no answer or with an answering machine were returned to the sample to be tried at a later time. These numbers were returned randomly at different days and times. Up to five callbacks were made on different days and at different times to reduce bias resulting from non-response due to respondent unavailability and busy numbers.
- Callback appointments were made with respondents who qualified and/or agreed to complete the survey but were not available for the required length of time. These numbers took precedence over all other calls and were automatically returned to the interviewer at the appointed time.

2.3.3 Survey Data Analysis

The survey data was analyzed using SPSS statistical software. Results are presented in Section of this report. When appropriate, confidence intervals at the 90% precision level were calculated to place reasonable bounds on the results. Note that confidence intervals can only be accurately estimated for binomial (e.g., yes/no) questions.

The analysis of survey data also explores whether or not select targeted groups (geographic, demographic, and psychographic) exhibit higher recall of Flex Your Power, Flex Your Power NOW!, and Flex Alert messaging and/or greater willingness to respond to such messaging. Chi-square tests were performed to determine if these comparisons are statistically significant; if a comparison is described as statistically significant in Section , the chi-square test was passed at the 90% confidence level. When chi-square statistics are presented, any time the "asymp. sig." statistic is *under* 0.10, the comparison is statistically significant at the 90% level. In some cases the statistics are presented in footnotes as: (chi-square, df, Asymp. Sig.).

To compare responses from different survey efforts (i.e., compare the baseline survey results to the post-summer survey responses) to measure changes in awareness, recall, and behavior over time, t-tests were conducted to determine if the changes were statistically significant at the 90% level.

The baseline and post-event survey data were also incorporated into the impact analysis methodology, which is fully explained in Section . The impact analysis utilized the SAS statistical software.

3. PROGRAM GOALS AND IMPLEMENTATION STRATEGY

3.1 Interviews with Program Staff and Stakeholders

Summit Blue conducted extensive interviews with the FYPN program staff and other key stakeholders at the IOUs and CAISO to review the parties' experience with FYPN, as well as the parties' understanding of the intent of the FYPN efforts.[17] Overall, comments indicated that coordination between FYPN, the IOUs, and CAISO has improved significantly over previous years. However, it does appear that support exists for more coordination and a more formal process in future program years.

3.1.1 Understanding of Goals of FYPN

- CAISO media relations staff are grateful to have the program, indicating that actual load relief can be observed at the system level. Engineers at CAISO were less convinced of the ability to identify load reductions related to the FYPN. Both stakeholders, however, were convinced that the effort was designed to reduce load from the grid.

- The majority of high-level IOU stakeholders as well as the program staff conceived of the effort as a general awareness effort that could be locally leveraged. There was conflicting feedback on whether the program should be designed for greater "impacts," e.g., reaching those that are both likely and able to conserve, versus raising general awareness of the issue.

3.1.2 Coordination of Efforts

- The effort's timing may need to be more flexible to accommodate other system demands encountered by the CAISO, such as unexpected transmission constraints. For example, the July 5th alert was called from 7AM to 7PM by the CAISO. But FYPN messaging more typically reflects a request for reduction in electrical use in afternoon hours.

- Other social marketing efforts such as the Bay Area's Spare the Air Campaign seem to have a simpler system for calling an alert.

- Getting the alert out in a timely fashion for news media to issue a call to action the night before a Flex Alert can be difficult. Also, several entities coordinate with news media, e.g., the CAISO calls the media, as do FYPN and the IOUs. This could be a cause of confusion in terminology. It may be best to kick the FYPN effort off with a regional briefing for the news media at the beginning of each summer to improve consistency in language.

[17] Interviewees included: Ms. Lynda Ziegler of SCE, Mr. Mark Gaines of SDG&E, Mr. Roland Risser and Mr. Fred Whitfield of PG&E, and Ms. Stephanie McCorkle of the CAISO. Mr. Walter McGuire of McGuire and Company was extensively interviewed and additional follow-on phone calls with Ms. Colleen McCarty (McGuire and Company) and Ms. Leah Mitchell (Frasier Communications) were conducted in the spring of 2007. . . . .

- The IOUs would prefer to be briefed on the strategy and design approach earlier in the process. There is a preference for this approach to be more formalized than it has in the past, though the marketing program advisory group ("PAGette") briefing process was cited by several as an improvement over prior years.

- IOU stakeholders generally believe that the timing of the final creative leaves little time for efficacy testing and results presentation to the PAGette. Though most do appreciate that creative design "by committee" is not the best way to prepare a social marketing effort, there still is a desire for the process to begin sooner. (In the current process, the IOUs have input but not "approval" of the messaging.)

3.1.3 Design Feedback

- Modifying the name of FYPN effort (Power Alerts, PowerDown, Flex Your Power Now, Flex Alert, etc.) each year may undermine efficacy. Stakeholders get confused about how to refer to the effort and may lapse into older terminology.

- Political constraints could affect messaging choices and efficacy. For example, helping to avoid turning on expensive peak power generation with potentially greater pollution impacts could resonate – but it is not likely to be worth testing for FYPN as it could engender finger-pointing rather than being solution-focused. Note that it was only in this past year that the use of "global warming" became politically tenable for a state endorsed marketing effort like FYPN. In a similar vein, the emphasis on preventing blackouts is new for 2007 and appeared to resonate well.

- Some stakeholders are open to a more regional alert scheme that would allow a focused effort in those areas most in need of load relief on a given day. This might also allow the timing of the call to address the local system peak. Allowing inclusion of utility logos and driving website traffic from FYPN to IOUs (or in reverse) are design questions that recur and should continue to be considered. Still others feel that a consistent statewide message would best serve the needs of the state.

- Most IOUs felt that the FYPN effort did provide local leverage, but with increasingly sophisticated IOU demand response programs and even tariffs, such as the Peak Time Rebate in SDG&E territory and under consideration at SCE, there was concern about confusing customers in future years.

- Other necessary messaging is competing with FYPN: messaging about cooling centers for the elderly and infirm and Spare the Air pollution advisories both typically occur during FYPN events. Coordination between these efforts does occur but increased coordination could improve each effort's reach.

- Several interview subjects expressed concern about the timing of the alert season, indicating that each IOU had to compromise to obtain the coverage best suited for the entire state, rather than each IOU. Many feel that it should be possible for the media buy to accommodate a different season for each IOU territory.

- The need for a formal process, presenting market research on barriers to action, appeared to be supported by all interviewed. Many support expanded targeting but appreciate the cost to run a media campaign in a state as large and diverse as California. Note that this could potentially be exacerbated in election years.

- Some concern existed about using similar logos for FYPN and FYP and whether this confuses viewers.

- It would appear from interviews that partnership effects of the FYPN could be undervalued. Focusing solely on residential response in the evaluation could be missing voluntary corporate response in the form of commercial and industrial voluntary load reduction or employee response to messaging, such as through response to rebroadcast emails.

- General support exists for thanking Californians for doing their part.

3.1.4 Conclusions from Program Staff and Stakeholder Interviews

- Significant process improvement has occurred since the program was last evaluated. Many participants expressed appreciation for this.

- Additional room for improvement in coordination does exist, e.g., with respect to the timing of the calling of Flex Alerts and support of the many news media outlets and IOU websites that pick up and amplify the message.

- Modifying segmentation should be considered, but could have potentially significant financial impacts.

- If FYPN were to be modified substantially, there is concern about losing ground with current program name recognition.

3.2 Media Purchasing Review

As part of the process evaluation of the Flex Your Power Now! (FYPN!) campaign, Summit Blue Consulting solicited the assistance of MoGo Marketing and Media ("MoGo") to perform an audit of Frasier Communications' media campaign planning and purchasing strategies for the summer 2006 FYPN campaign. MoGo is a highly reputed California-based firm with large clients nationwide. The firm developed and implemented the Bay Area Air Quality Management District's Spare the Air Campaign's media purchasing strategy, and is familiar with the goals and challenges of social marketing campaigns. Given the unique terminology and standards used in the field of media buying, Summit Blue believed a peer media firm was best-positioned to evaluate Frasier Communications' media purchasing strategies. MoGo reviewed a variety of characteristics of the 2006 campaign including media mix, "daypart" mix (times of day ads are run), specific programs purchased, cost per point ("CPP") and cost per thousand people reached ("CPM") of all media purchased, reach (percentage of population reached) and frequency (number of times each consumer receives a message).

Frasier Communications provided the information MoGo requested to complete the evaluation. Two additional sources of information used for the evaluation were: 1) SQADs, long-term industry standard benchmark data drawing on pricing data provided by many agencies; and 2) market intelligence through outbound calls placed by MoGo.

On September 5, 2007, MoGo presented its findings to the Demand Response Measurement and Evaluation Committee (DRMEC) which is responsible for the management and oversight of the FYPN evaluation. This section summarizes MoGo's findings.

3.2.1 Campaign Planning

The FYPN media campaign was planned and purchased as part of the broader Flex Your Power (FYP) summer campaign. According to Frasier, the FYP campaign ran from July 3rd through September 24th, 2006 and FYPN messages were trafficked into the ad inventory during Flex Alert days. FYPN messaging ran on nine days (7/17-7/21 and 7/24-7/27) during the July '06 heat storm. Because of the timing limitations of the umbrella FYP media purchase agreement, there were certain weeks during which no ads were bought. Therefore, if a Flex Alert day occurred during one of these weeks, no FYPN ads could be run. Six days of potential FYPN messaging were lost due to the closure of weekend station logs before Flex Alerts were called.

Target Audience Analysis

The same target audience was used for both FYPN and FYP: married, college educated adults with a skew to women, 35 years of age or older with a household income of $75,000 or more. The target was derived from analyzing the demography of those who indicated that they:

- are willing to give up convenience in return for a product that is environmentally safe;
- have participated in environmental groups or causes;
- regularly recycle;
- and believe that preserving the environment and helping to preserve nature is very important.

The target audience for FYPN was based on the assumption that the FYPN media buy would be most cost-effective if leveraged off the FYP buy, using a trade out strategy where FYPN spots are rotated when needed into the FYP time slots.

MoGo suggests reconsidering segmentation, such that the target audience could be expanded for the FYPN component of the campaign to include a younger segment of the population, noting that 18-34 year olds comprise 35% of the state's total 18+ population. The target could also be expanded to include renters and non-conservation minded people. By expanding the target, the campaign would cover a broader list of programs and cable networks, and a deeper list of radio formats. Different messaging could be used for different target segments.

Communication Strategy Analysis

The overall strategy was to surround the target with the FYPN messages through their days to yield a positive consumer action. Specifically, the campaign sought to achieve a "reach"[18] of 95% and a "frequency"[19] of 35 exposures within the top four markets. For the remaining markets, the goal was a reach of 90% and a frequency of 25 exposures. The rationale behind these goals is that the campaign window is very short, spanning only the three months when the weather is the hottest and the need to reduce demand is most crucial. The goal was to reach the greatest number of different people across all counties, and to provide numerous reminders to emphasize the importance of taking action.

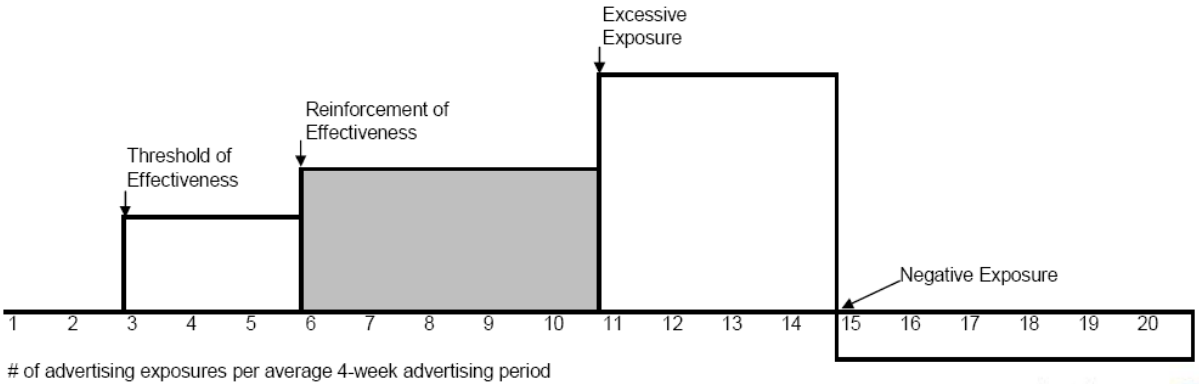
MoGo found the frequency goals excessive, with potential to actually have a negative impact on consumers as they may tune out or become aggravated by the message after hearing it too many times. The actual frequency of the messaging was 25 to 35 exposures during the campaign. MoGo cited the

[18] Reach is defined as the percentage of the population reached in a given media vehicle.

[19] Frequency is defined as the number of times each consumer receives the message of a campaign.

theory of a well-recognized leader in media, Alvin Achenbaum, who states that three to five exposures fall in the "threshold of effectiveness" category, that six to ten exposures fall into the "reinforcement of effectiveness" category, that 11 to 14 messages fall in the "excessive exposure" category, and that anything over fifteen exposures is in the "negative exposure" category. It is important to note, however, that placing an emergency call to action is somewhat different than traditional advertising. Still it may be that refocusing the buy to have slightly lower exposure rates (frequency) but a greater range of segments could result in better market penetration (reach).

Figure -. Frequency Spectrum



Source: Alvin A. Achenbaum (ANA Media Workshop)

MoGo suggested that Frasier consider using separate communication strategies for general FYP efficiency education and for alerts. The Flex Alert portion of the campaign should be at relatively high frequency levels during only the short time frames of the Flex Alerts so they will be more effective in bringing about action during critical periods.

Media Mix

The media mix consisted of TV (broadcast including PBS, cable, sports & news, traffic reports), radio (spot radio and traffic reports), and "Out-of-Home" formats (large billboards, public transportation, city panels). MoGo explained that TV and radio are strong vehicles for the FYPN message because they accommodate the need for immediacy of message exposure, copy can be trafficked into rotation quickly during specific Flex Alert days, and they provide efficient, broad reach of the local markets. A unique benefit of TV is that it provides message impact through sight, sound, and motion. Radio is a strong frequency builder since listeners tend not to flip through stations like TV viewers.

MoGo found that Out-of-Home media is generally somewhat difficult to use effectively in the FYPN message because fixed media don't allow for sufficiently tactical trafficking of the FYPN message, and don't convey the necessary sense of urgency on specific days. Since the public saw the FYPN! messaging during the entire summer on Out-of-Home media, rather than just on Flex Alert days, the message likely lost impact. Out-of-Home media may not have provided a creative enough platform for the FYPN message. The best use of Out-of-Home media would have been to geo-target specific areas with high summer electricity demand levels and to use digital boards for quick message changes. The donated use of the digital Amber Alert street signs is thus likely to be very effective at building reach.

Weekly Weight Levels

For the top four markets, the weekly weight levels were 245 target rating points (TRPs) for TV and 210 TRPs for radio.[20] In the remaining markets, the weekly weight levels were 150 TRPs for TV and 210 TRPs for radio. MoGo found that strategic use of low weekly weight level sponsorships in sports, news, and traffic provided additional message frequency at much lower cost. While weekly weight levels were at appropriate levels for achieving the communication goals, they could be fairly high for any ongoing education or thank you efforts. MoGo suggested scheduling lower weekly weight levels during the general FYP education campaign, and increasing to higher levels during Flex Alert days to emphasize the importance of taking specific actions on those days in particular. Frasier should also consider skewing media weight levels to alert days to bring about immediate behavior impact, as opposed to using uniform media weight levels regardless of whether FYP or FYPN messages are being shown.

3.2.2 Campaign Purchasing: Analysis by Media Type

Analysis of Use of Television

TV Daypart Mix

The planned FYPN! daypart mix consisted of 10% early morning, 15% day, 20% early fringe/early news/weekend, 25% prime access, 15% prime/sports, and 15% late news.[21] The actual daypart mix varied by market based on upgrades that were negotiated and resulted in a greater mix of primetime than planned. The TV daypart mix was on target to achieve the communication goals, including a balance of high reach and cost-efficient dayparts, and providing coverage throughout the day. The message also benefited from upgrades to primetime and sports events. MoGo suggested skewing the mix to dayparts during which there is high power consumption to bring about immediate behavior impact.

TV Cost Per Point (CPP)

CPPs[22] were compared to industry benchmarks (SQAD data[23]) as well as market intelligence gained by calls placed by MoGo. Low SQAD data was used as a benchmark because large buys, like the FYP/FYPN campaign will garner lower CPP. For market intelligence, non-negotiated CPP data was collected from stations in each market to compare with the purchased CPPs. Cable was not analyzed separately as no specific benchmarks exist to separate it out from market CPPs. El Centro/Yuma was not included, as industry research is not available for this market.

[20] Weight levels are measures of the intensity of an advertising campaign over a period of time, expressed in target rating points (TRPs). Rating points are a measure of the combination of the percentage of an audience reached by a broadcast message and the frequency of that audience's exposure to the message. For example, if an ad is aired twice in one week and reaches 10% of the audience, the ad totaled 20 rating points.

[21] Dayparts are the specific time segments of a broadcast which are determined by the type of programming and who provides it (local or network). Despite the "time of day" connotation implied by the term "daypart", weekends can be considered a daypart because they have different broadcast schedules than weekdays and thus are treated differently in media buys.

[22] Cost Per Point (CPP) is defined as the cost, per one percent of a specified audience, of buying advertising space in a given media vehicle.

[23] SQADs are long-term industry standard benchmark data drawing on pricing data provided by many agencies. The term is derived from the company that provides the data, SQAD Inc.

MoGo found that the campaign achieved good pricing, as expected, because it is large and carries substantial buying power. Overall, purchased CPPs were below SQAD and market intelligence pricing. In the few cases where purchased CPPs were higher than SQAD, they were below market intelligence pricing. For example, for the top four markets: Los Angeles came in 11% under the low SQAD and 23% under the market intelligence; San Francisco came in 3% over the low SQAD and 10% under the market intelligence; San Diego came in 5.6% under the low SQAD and 20% under the market intelligence; and Sacramento came in 13% over the low SQAD and 11% under the market intelligence.

MoGo stated that the FYP/FYPN campaign could have the same buying power if they negotiated more flexible terms allowing different target markets or different weight levels during Flex Alert periods vs. non-Flex Alert periods. They could promise to spend a certain total dollar amount, but just require the ability to have more say over when those dollars are spent.

TV Programs

Programs identified as being high priority for FYP advertising, given the target audience, included: 60 Minutes, Dateline, 20/20, Prime Time Live, 48 Hours, Grey's Anatomy, CSI (CSI, Miami, New York), Good Morning America, Today Show, Oprah, Ellen, and Dr. Phil. However, given that the campaign is limited to summertime, these shows are not necessarily the most appropriate selections. MoGo pointed out that the summer is rerun season so it would make more sense for the campaign to focus on summer first run programming and sporting events (i.e., All Star Game, Wimbledon, and Miss Universe) which are much more highly ranked during summer months than program reruns.

Cable Networks

Cable networks identified as high priority for the FYPN campaign included CNN, CNBC, MSNBC, History, Discovery, HGTV, A&E, Travel, Bravo, and Food Network. Purchased cable networks reflected those on the priority list in virtually all of the markets. However, the priority list did not include two top-ranked networks catering to those in the 35-64 age bracket: USA and TNT. MoGo suggested that the campaign capitalize on first run programming on cable networks, noting that July is a strong month for first run programming due to summer reruns on broadcast stations. Several top-ranked cable programs were not bought by Frasier (e.g., Monk, Psych, and The Closer). MoGo suggested using fixed spots in programming to help build message frequency.

Analysis of Use of Radio

Radio Daypart Mix

The FYPN daypart mix consisted of: 27% morning drive, 25% midday, 18% afternoon drive, 13% weekend, 17% 6am-7pm energy vignettes (short spots throughout the day).[24] Additionally, traffic report sponsorship ran on rotation from 5am to 8pm. The majority of traffic report sponsorships aired during morning and afternoon drive times. The daypart mix was on target to achieve communication goals. The majority of ads ran during high-rated morning and afternoon drive times. MoGo discussed the importance of radio as part of the media mix because it reinforces ideas, even if listeners are not at a place where they can turn off equipment (e.g., if they are listening to the radio while driving). Radio listeners tend to listen

[24] Dayparts are the specific time segments of a broadcast which are determined by the type of programming and who provides it. Despite the "time of day" connotation implied by the term "daypart", weekends can be considered a daypart because they have different broadcast schedules than weekdays and thus are treated differently in media buys.

to the same station regularly; therefore, it is easier for a media campaign to achieve frequency goals with radio.

Radio CPPs

Radio CPPs were compared with industry benchmark (SQAD) and market intelligence. Again, El Centro/Yuma was not included as industry data is not available for those markets. As with the TV analysis, low SQAD data was used as a benchmark given the large size of the campaign and the likelihood for it to achieve low pricing. As with the TV CPPs, purchased radio CPPs were below SQAD and market intelligence pricing. In some of the smaller markets, CPPs were higher, but this is generally a result of poor SQAD data. In the few cases where purchased CPPs were higher than SQAD, they were below market intelligence pricing.

Radio Formats Purchased

Radio formats identified as priorities for the FYPN message included: news, news/talk, National Public Radio, country, adult contemporary, oldies, classic rock, soft adult contemporary, and smooth jazz. The purchased radio formats reflected those on the priority list. The buy also included top-ranked stations targeting the 35-64 age bracket in each market.

Analysis of Use of Out-of-Home

Out-of-Home purchases were made in Los Angeles (bulletins, "bus kings" - large signs on sides of buses, and city light panels); San Diego (bulletins and bus kings); and San Francisco (bulletins and BART-public transit). Bulletin coverage in each of the markets was strong, delivering high impressions at an efficient cost per thousand people (CPM). The two most cost-efficient buys in terms of CPM were the LA City Lights Panels (CPM: $1.87) and the BART (CPM: $2.28). Bus kings in LA and San Diego were the least efficient of all outdoor ads purchased. A poster or bulletin campaign may have been a more efficient alternative to transit for covering the Orange County and North County areas.

MoGo suggests that the use of and weighting given to Out-of-Home media in the buy should be reconsidered. In order to provide the specific FYPN message with a call to action, use of digital boards should be maximized since they can be changed frequently during Flex Alert days. Geo-targeting should be used to target areas with high power consumption.

3.2.3 Achievement of 2006 Campaign Goals

Broadcast Reach and Frequency Goals

In virtually all markets communication goals were exceeded. Shortfalls were negligible. The 95% reach goal was achieved in each of the top four markets, and only one market fell short of the frequency goal (33x frequency in Sacramento, compared to 35x goal). Of the remaining markets, two fell short of the 90% reach goal (88% and 89%), and one fell short of the 25x frequency goal (21x).

Planned vs. Actual Expenditures

An analysis of planned versus actual expenditures was conducted. Overall, the campaign was able to achieve somewhat lower spending than planned and somewhat higher media weight than planned. For the top four markets, the "index to planned" ratio was close to 100 (or 100% of the target) in TV, radio, and Out-of-Home media channels (a reasonable result is anywhere from 90 to 110). The grand total for net

dollars spent was 99, and for media weight was 105. Some target areas were over- (cable TV) or under-delivered (sports and news TV), but these differences balanced each other out. The top four markets over-delivered TRPs by 8% and hit 100% of budget. For the remaining eight markets, actual schedules achieved or exceeded goals as well. These eight markets also over-delivered TRPs (1%) with a 5% savings in budget. Overall (statewide), purchased dollars came in 1% below goal, and purchased TRPs exceeded planned by 5% (Table -).

Table -. Statewide Summary of Planned v. Delivered Advertising

MEDIUM/MARKET	PLANNED	DELIVERED		INDEX TO PLANNED	
	Net Dollars	Net Dollars	Difference	Net Dollars	Media Weight
GRAND TOTAL TELEVISION	$6,005,369	$5,802,558	-$202,812	97	98
GRAND TOTAL RADIO	$2,786,834	$2,877,298	$90,464	103	112
GRAND TOTAL OUTDOOR	$1,000,000	$1,036,951	$36,951	104	NA
GRAND TOTAL MEDIA	***$9,792,203***	***$9,716,806***	***-$75,397***	***99***	***105***
MEDIA PARTNERSHIPS	$595,807	$595,807	$0	NA	NA
GRAND TOTALS	***$10,388,010***	***$10,312,613***	***-$75,397***	***99***	***105***

Source: MoGo Marketing PowerPoint Presentation, Sept. 5, 2007

3.2.4 Conclusions from Media Purchasing Review

Overall, expert purchasing review of the FYPN campaign revealed excellent achieved value and general achievement of the objectives set out in the media plan. The core target was reached through a varied media mix that was competitively priced to industry standards and balanced with high reach and frequency. Programs and radio stations selected were consistent with the target's listening habits. The plan delivered on its goal for dollars and Target Rating Points ("TRPs", a measure of media "weight" in the market). However, MoGo found potential for a number of improvements.

In the area of **campaign planning**:

- Frequency goal could be decreased. Too many exposures can leave a negative impression, and can cause consumers to tune out when the messaging is most important on Flex Alert days. The optimal frequency could be tested in focus groups.

- There should be greater differentiation between the FYP and FYPN campaigns; communication goals and weight levels did not take into account the differences in the type of messaging between the two components of the campaign.

- The target audience could be expanded for FYPN ad placement (while maintaining the focused target for general FYP ads).

- Lower "weight levels" (market reach) could be used for the standard FYP efficiency education campaign to minimize message burnout, increasing to substantially higher market weight during Flex Alert days to compel the target audience to take immediate action. During the summer of '06 there was no differentiation. It should be noted that only FYP education ads (focusing on general efficiency messaging) and Flex Alerts ran during 2006. FYPN education was not run during 2006.

- Reconsider weight received by out-of-home media for FYPN ads, increasing use of digital boards so messages can change quickly during Flex Alert days, and geo-target areas with highest power consumption. This out-of-home format needs to convey the message in two seconds, which can be difficult for a campaign like FYPN. Donated Amber Alert sign time may be effective and should be considered.

- Use online advertising. There was no online component to the campaign except for email blasts, though online in the form of banners and other web ads is an ideal messaging vehicle for this type of campaign. Online can be a highly responsive and cost efficient medium for FYPN messaging and can now be deployed using geo-targeting to the zip code level if necessary. An online campaign can be staged and triggered remotely via computer access within less than one hour of an alert notification, instantly delivering millions of impressions to thousands of websites. Online banners would allow for numerous creative messages, could be targeted contextually as well as behaviorally, and the optimization tools would drive performance and valuable learning for future alerts.

In the area of **campaign purchasing**:

- To ensure FYPN messaging on all alert days, pay scheduling premiums to alleviate creative trafficking issues. Flexibility could be built into media purchase ensuring ability to purchase FYPN ads on Flex Alert days. FYPN ads only ran on nine of 15 Flex Alert days due to limitations in the umbrella media purchase used in 2006. The campaign could pay a premium to ensure FYPN ads could be run at the last minute. A successful approach pioneered by MoGo for the Bay Area Air Quality Management Board's Spare the Air campaign was to negotiate the ability to make incremental purchases of ad spots during high priority days (so other advertisers would be bumped during those priority days to make space for the alert ads).

- Differentiate buying strategies for FYP and FYPN, maximizing cost efficiency with FYP education ads, and expanding target and using heavier weight levels for FYPN! ads (alerts only).

- Consider increasing weight levels for areas with highest power consumption. It is likely that higher demand response impact areas are actually lower weight (and therefore less expensive) media areas. For example, the state's interior (i.e., Central Valley) has higher A/C load than the foggy coastal areas, though Central Valley media outlets have lower weight than coastal areas due to lower population.

- Top summer TV programs were not purchased for 2006 FYPN campaign (first-run programming on cable, World Cup, All Star Game, Wimbledon, and Miss Universe). These top-rated summer programs should be a priority for future media purchases.

3.3 Observations from Flex Alert Days

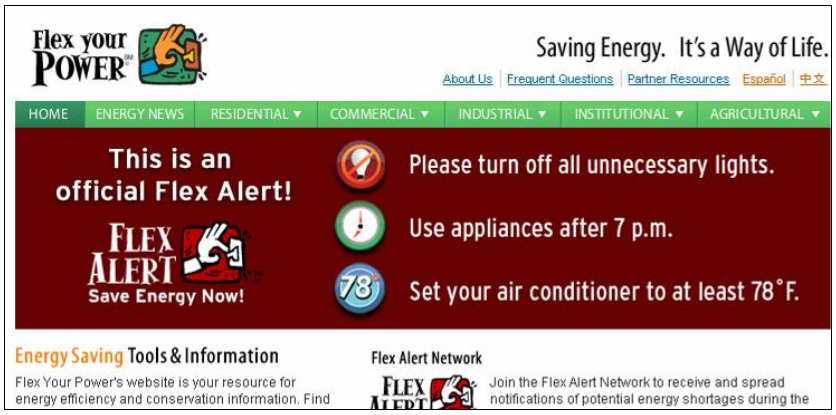
On the afternoon of Tuesday, August 28, 2007, the California ISO announced that a Flex Alert would be called for the following Wednesday and Thursday (it was subsequently extended through Friday). The Summit Blue team tracked the coverage given to the Flex Alert on the Flex Your Power website (fypower.org), the California ISO's website, the IOUs' websites, and various news media websites, and also reviewed television broadcasts to see what paid commercials and/or unpaid mentions in the news that the Flex Alert was receiving. The results of this review were presented in detail in Summit Blue's post-event memo; this section summarizes the memo's key points.

Note that no first-hand observations were made during the 2006 FYPN campaign because Summit Blue was awarded the evaluation contract after the 2006 campaign had ended.

3.3.1 Information/Alerts Displayed on FYPower.org, CAISO.com, and Utility Websites on Flex Alert Days

Flex Your Power Website

The Flex Your Power website (fypower.org) displayed the following banner graphic on its website starting the morning of Wednesday, August 29, 2007 (image captured at 9:04 AM). The graphic announced that "This is an official Flex Alert!" and listed the three key recommended conservation actions: turning off unnecessary lights, use appliances after 7 PM, and set your air conditioner to at least 78 degrees. Because Californians appear to be having a hard time understanding that the response is needed *today*, some additional message content emphasizing the immediacy could be useful; otherwise, visitors to the site might think the banner could have been up for a week. The site also prominently featured a sign-up for email alerts.



On Friday, visitors to the FYPower.org website encountered an animated intro screen with glass over a light switch being broken and text declaring that "State officials have called a Flex Alert." At the end of the animation, visitors are presented with a form to spread the word to family and friends with an emailed Flex Alert. After viewing the intro and email form, visitors could click through to the same FYPower.org home page displayed above. Summit Blue considers these additions to the website to be a significant improvement. The new animated intro to the website was attention-grabbing and the email form tapped into social networks by encouraging the visitor to get the conservation message out to their friends and family. However, there is some concern that flashy animation may not load well on slow internet connections.

Section below presents an overview of the traffic to the FYPower.org website over the summers of 2006 and 2007, including traffic to the site during the August 2007 Flex Alert period.

CAISO Website

This section provides a summary of the alert timing and information provided by the California Independent System Operator (CAISO) on its website, www.caiso.com, during the Flex Alert period.

CAISO Alert Procedures

Alert notification timing is a critical component to effective message provisioning. CAISO holds the responsibility to "call an alert" and notify FYPN, who in turn triggers media efforts. Timely notification is key to obtaining paid and news media access that allows Californians to be notified of Flex Alert days and critical peak concerns *before* these events occur so that they may *plan ahead* to use less electricity. Other providers of emergency or event based marketing, such as Spare the Air in Northern California, point to their ability to predict and notify the media of an event in a timely manner in part due to their single agency status and simple notification procedures. Recently CAISO updated their emergency procedures to also reflect an emphasis on this timing concern. Their procedures call for notification of Alerts (for Potential Firm Load Interruptions) to issue by 2:00 PM on the day prior, though provision for shorter notification times due to severe conditions are also envisioned. However, the Flex Alerts which are declared in advance of—and for the purposes of avoiding—a "stage 1 electrical emergency" could be better integrated with the ISO alert-warning-emergency (AWE) structure.[25] In the past, the emergency procedures called for Flex Alerts to be issued when operating reserves dipped below 7%. However, in practice, other circumstances may create the need to call a Flex Alert without much warning such as was the case in July 2007 when a transmission line was damaged in a small plane crash; other low-probability/high-consequence events can readily be imagined, such as fires, earthquakes, transmission failures, or other forced outages.

It is important to note that in CAISO's recent review of summer operating procedures designed to help personnel plan for a range of possible summer operating conditions (for 2008), no mention of the Flex Alert system was made. For this work, CAISO relied on available demand response as provided by the Energy Commission. Because FYPN does not have specific MW goals, it was appropriately not included in the estimates. However, the lack of discussion in this document about FYPN and Flex Alert procedures does suggest a potential disconnect at CAISO in how the FYPN effort is viewed, e.g., as more of a media function rather than an important operating procedure capable of delivering load relief to the grid. [26]

Alerts/Data Provided on CAISO Website during August 2007 Flex Alert

The CAISO website was slower than the Flex Your Power website in posting an alert message; at 10:15 AM on 8/29/07, the website gave no indication that there was a need for energy conservation that day, other than a small "Conserve-O-Meter" being at "Needed". By 11:54 AM, the CAISO website had added a "Flex Alert: Save Energy Now!" logo to its homepage. However, the logo did not link to the FYPower.org website or any additional information on energy conservation tips. Throughout the Flex Alert period, the CAISO website provided information on the current alert level, the current system demand, the peak demand thus far that day, the forecast peak demand, and the available energy supply. However, the only conservation tips were found in the press releases, which were buried in subpages of the website; a prominent Flex Alert graphic with the three key Flex Alert-recommended actions (or at

[25] The CAISO communicates with several constituencies (as do utilities). Notifications must go out for firm load reductions as well as to the general public regarding grid operating conditions and the need for conservation. The possibility for communications intended for different audiences to be conflated (particularly by the news media) is a potential concern.

[26] CAISO Operating Procedure, E-508: Electrical System Emergency, Version 4.6, May 23, 2007 and Operating Procedure E-508C Version 2.1, Electrical Emergency Notices, revised July 7, 2007. Available at: http://wepex.net/thegrid/operations/opsdoc/emergency/index.html. See also CAISO 2008 Summer Loads and Resources Operations Preparedness Assessment, April 28, 2008. Available at http://www.caiso.com/1fb7/1fb7855eed50.pdf. See also Section for discussion of Summit Blue's process interviews with CAISO staff.

least a link to the FYPower.org website) right on the CAISO homepage would have been helpful, considering that many of the news outlets' websites directed readers/viewers to the CAISO homepage, rather than the FYPower.org website, as did SDG&E's website (see following sections).

CAISO Press Releases

Summit Blue reviewed the press releases archived on the CAISO website to observe how CAISO communicated the Flex Alert event to the media. CAISO issued a series of six press releases related to the Flex Alert. The first one, titled "Flex Alert", was released on Tuesday, August 28, 2007, and stated that conservation was urged during the peak hours of 4-6 PM on Wednesday and Thursday. It listed "Powerful Habits" to conserve energy, including setting thermostat at 78 degrees or higher, cooling with fans, drawing the drapes, turning off unnecessary lights and appliances, and using big appliances in early morning or late evening. The press release also suggested visiting www.fypower.org for more energy conservation tips. It stated that "the California ISO is not expecting any shortages…but is urging all Californians to reduce energy demand during the afternoon."

On Wednesday, August 29th, CAISO issued a press release titled "Conservation Urged With Westwide High Temps" and provided much of the same information as the previous press release, with the addition that a Stage One Electricity Emergency was now expected for that afternoon, meaning that voluntary conservation was needed between 4 and 6 PM. It also listed "Powerful Habits", but slightly different ones that the day before: set your thermostat at 78 degrees or higher when home, off when away; avoid using unnecessary lighting and appliances during the peak usage period from 4 to 6 PM; turn off your pool pump and avoid outdoor watering during peak hours. Later on Wednesday, another press release was issued, announcing the Stage One Electrical Emergency coming into effect from 3:20 to 8:00 PM that afternoon and evening.

On Thursday, August 30th, CAISO issued a press release titled "Stage 1 Electrical Emergency Expected: Conservation Urged." The release emphasized that blackouts were not expected. The release provided similar energy conservation tips as the previous releases had, but this time they were called "Flex Your Power NOW! Conservation Tips" rather than "Powerful Habits."

Another press release was issued on Thursday evening, crediting Californians with achieving over 1000 MW of voluntary conservation and extending the alert through Friday afternoon. CAISO followed up with another thank-you press release on the following Tuesday, September 4th.

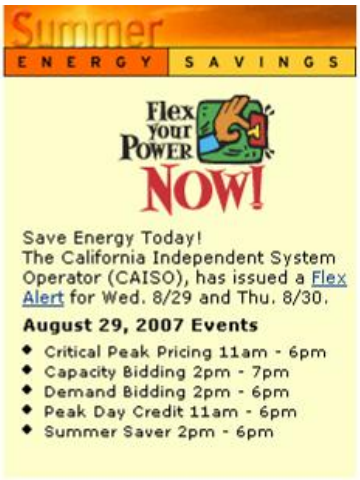
Utility Websites

The three investor-owned utilities' (IOUs') websites used different phrases and logos to promote voluntary conservation during the three-day Flex Alert period. SCE and PG&E both used the phrase "Conservation Alert"; by Thursday, August 30th, SCE added a "Flex Alert: Save Energy Now!" logo to its Conservation Alert banner image on its homepage, but PG&E never used the Flex Alert or Flex Your Power NOW! phrase or logo. SDG&E started out using the Flex Your Power (not Flex Your Power NOW! or Flex Alert) logo, added the phrase "Flex Alert" in text, eventually switched to the Flex Your Power NOW! logo, but never used the new 2007 "Flex Alert: Save Energy Now!" logo.

Section below presents an overview of the traffic to the IOU websites during the August 2007 Flex Alert period (Wednesday, August 29th through Friday, August 31st).

San Diego Gas and Electric Website

By mid-morning Wednesday, the SDG&E website displayed a Flex Your Power (not Flex Your Power NOW! or Flex Alert) logo and the words "Save Energy Today! The California Independent System Operator (CAISO) has issued a Flex Alert for Wed. 8/29 and Thu. 8/30." The words "Flex Alert" were a link to the CAISO website. The only explanation that conservation was needed was "Save Energy Today!" and no conservation tips were provided. By mid-afternoon, they had switched over to the *old* Flex Your Power NOW! logo. The SDG&E website provided the same information on Thursday, but on Friday, only the FYPN logo remained, with no indication that the Flex Alert had been continued.



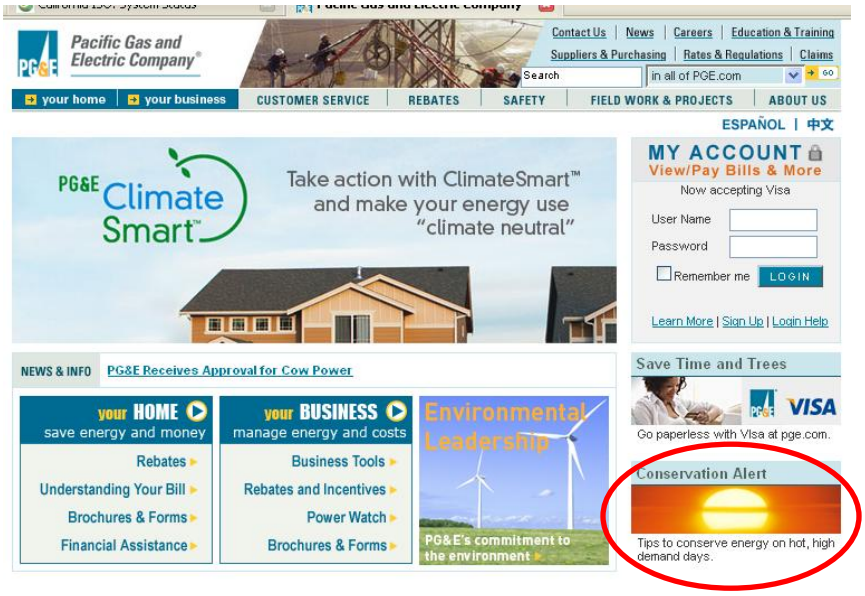
Southern California Edison Website

On Wednesday morning, the SCE website declared a "Conservation Alert", with no mention of Flex Alert. The banner graphic's tagline read "Conservation is always in season, especially on hot days." If visitors clicked on the "Learn More" button, they were taken to a page with conservation tips and an explanation of why conservation can help keep the lights on. On Wednesday afternoon, the phrase Flex Alert was added to this conservation page, with a link to the CAISO website (but not FYPower.org).

By Thursday afternoon, the SCE website was modified to include a "Flex Alert: Save Energy Now!" logo, the tagline "Power reserves are low – please limit your electricity usage", and the word "Urgent" on the Conservation Alert banner. Later in the afternoon, the banner was further modified, adding the phrase "This is an official Flex Alert!" but removing the statement "Power reserves are low – please limit your electricity usage" and the word "Urgent", and returning to the "Conservation is always in season" message. This tagline conflicts with the concept of an alert, suggesting long-term behavior changes rather than short-term emergency response.

Pacific Gas and Electric Website

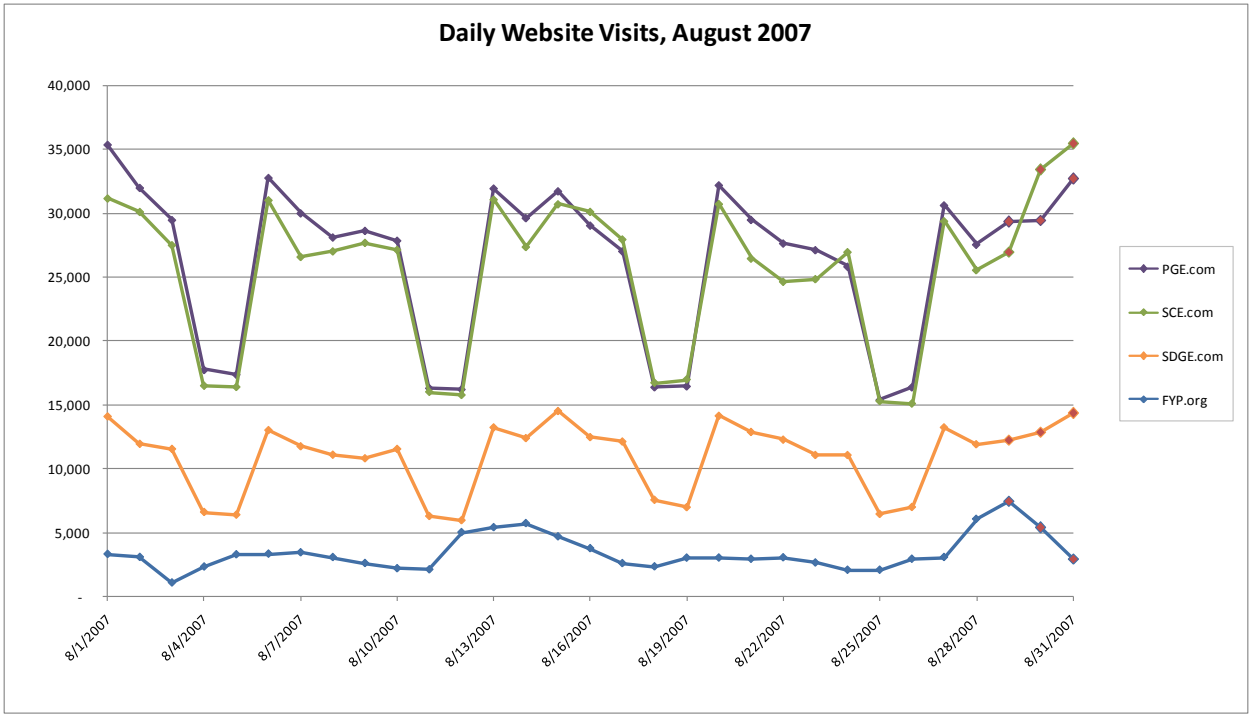
Of the three major utilities' websites, the PG&E website gave the least prominence to the Flex Alert and need for conservation. It wasn't until Wednesday afternoon that a very small "Conservation Alert" graphic appeared on the lower right-hand corner of the homepage, with the words "Tips to conserve energy on hot, high demand days." Using the plural "hot, high demand days" significantly undercuts the urgency of the alert message, and the placement on the website, which was dominated by a large advertisement for PG&E's Climate Smart program, further reduces the likelihood that any visitor to the website would even realize that an important alert was in effect.



3.3.2 Website Traffic Analysis

Summit Blue obtained website traffic statistics for the Flex Your Power website as well as the three IOUs websites to look for any increase in traffic during Flex Alert events. Figure - summarizes the daily visits to the four websites in August 2007 (note that the Flex Alert period comprised August 29th through 31st). In the review of media coverage of the August event (see Section), Summit Blue observed that television news outlets frequently directed viewers to the IOU websites rather than the FYP website. Further analysis of each website's traffic follows in subsequent sections.

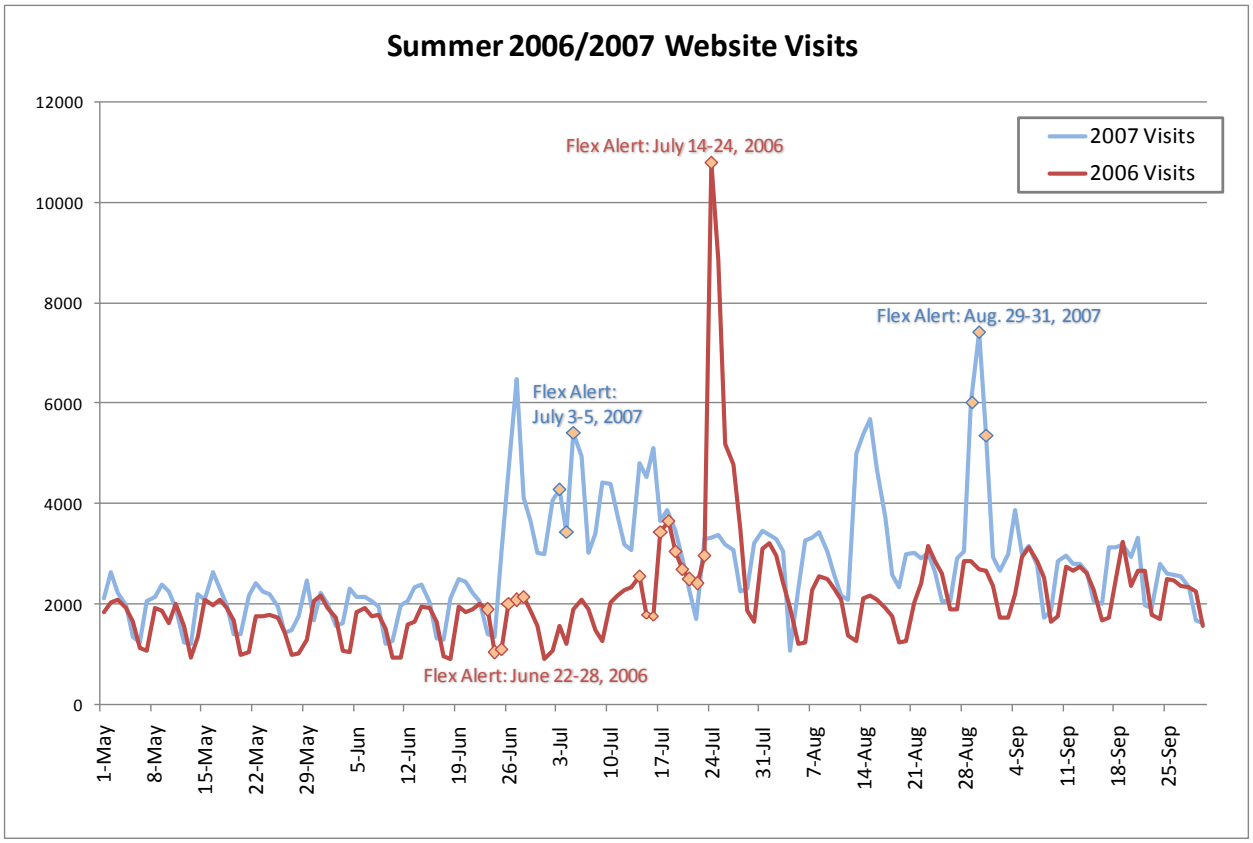
Figure -. Daily Visits to FYP and IOU Websites, August 2007



Flex Your Power Website (www.fypower.org)

Figure - summarizes daily visits to the Flex Your Power website during the summers of 2006 and 2007. Unsurprisingly, daily visits to the site increase significantly in mid-June when FYP advertising begins its summer campaign, and there are spikes associated with Flex Alert events (except the June 2006 Flex Alerts, for which television advertisements were not run). During the August 2007 Flex Alert, daily visits spiked from average summer levels of roughly 3000 visitors per day to nearly 8000 on Wednesday, August 29, 2007. However, after the Wednesday spike, visits then declined on Thursday and Friday to average levels.[27]

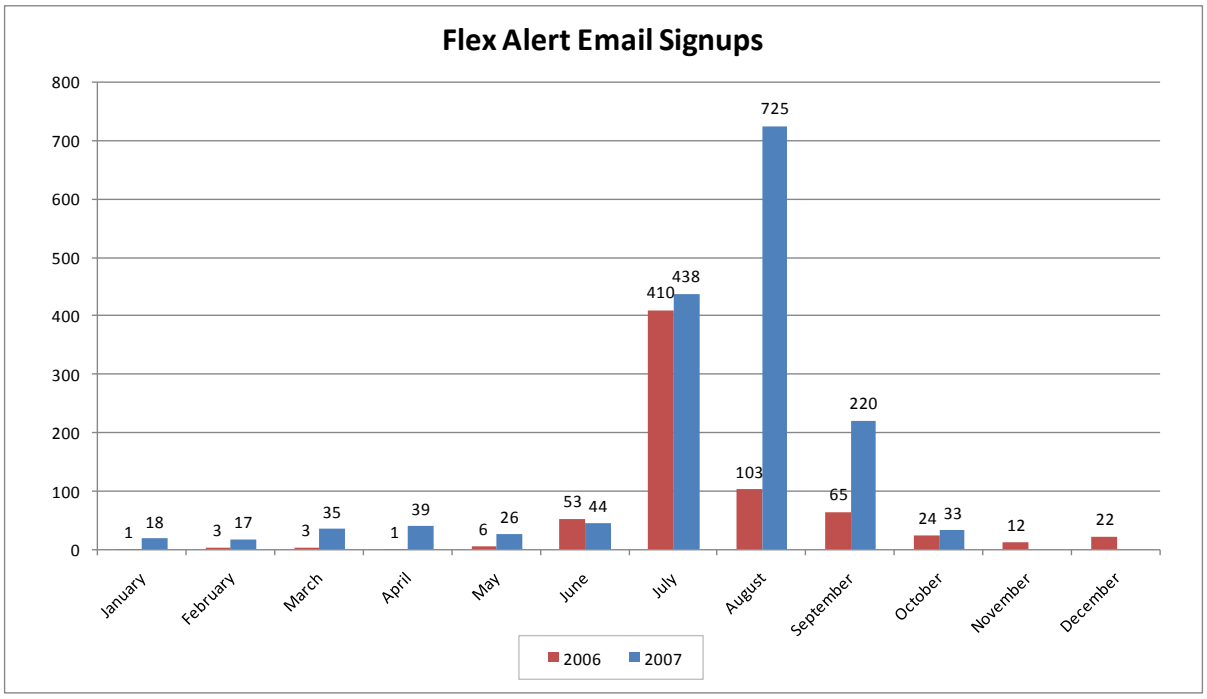
Figure -. Daily Visits to Flex Your Power Website in Summers 2006 and 2007



[27] One hypothesis for this spike on Wednesday followed by a decline on Thursday and Friday is that the news media stories reviewed by Summit Blue used the "Flex Your Power NOW!" or "Flex Alert" terminology primarily on Wednesday; by Thursday and Friday, the media had shifted towards using the phrase "electrical emergency" and discussing the possibility of blackouts, de-emphasizing the Flex Alert call for conservation.

Efforts to collect email addresses for distributing Flex Alert notifications were significantly more effective in 2007 than in 2006 (Figure -). The Flex Your Power website collected 703 email addresses in 2006 and 1595 in 2007. Almost one-third (510) of the email addresses collected in 2007 were collected during the three-day Flex Alert period in August.

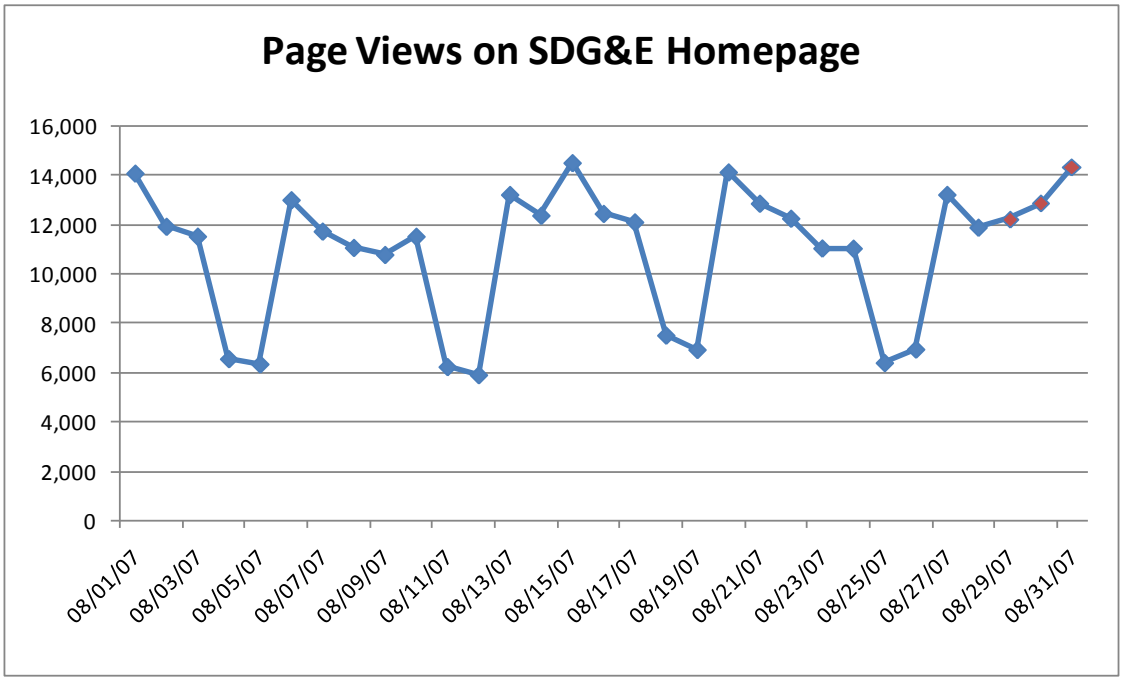
Figure -. Flex Alert Email Signups through Flex Your Power Website



San Diego Gas and Electric Website (www.sdge.com)

As shown in Figure -, daily views of the SDG&E homepage increased slightly during the August 2007 Flex Alert. While most weeks generally showed a high number of roughly 13,000-14,000 page views on Monday, followed by a decline over the rest of the week until spiking back up to Monday again, the daily views during the Wednesday through Friday of the Flex Alert period showed a slight increase.

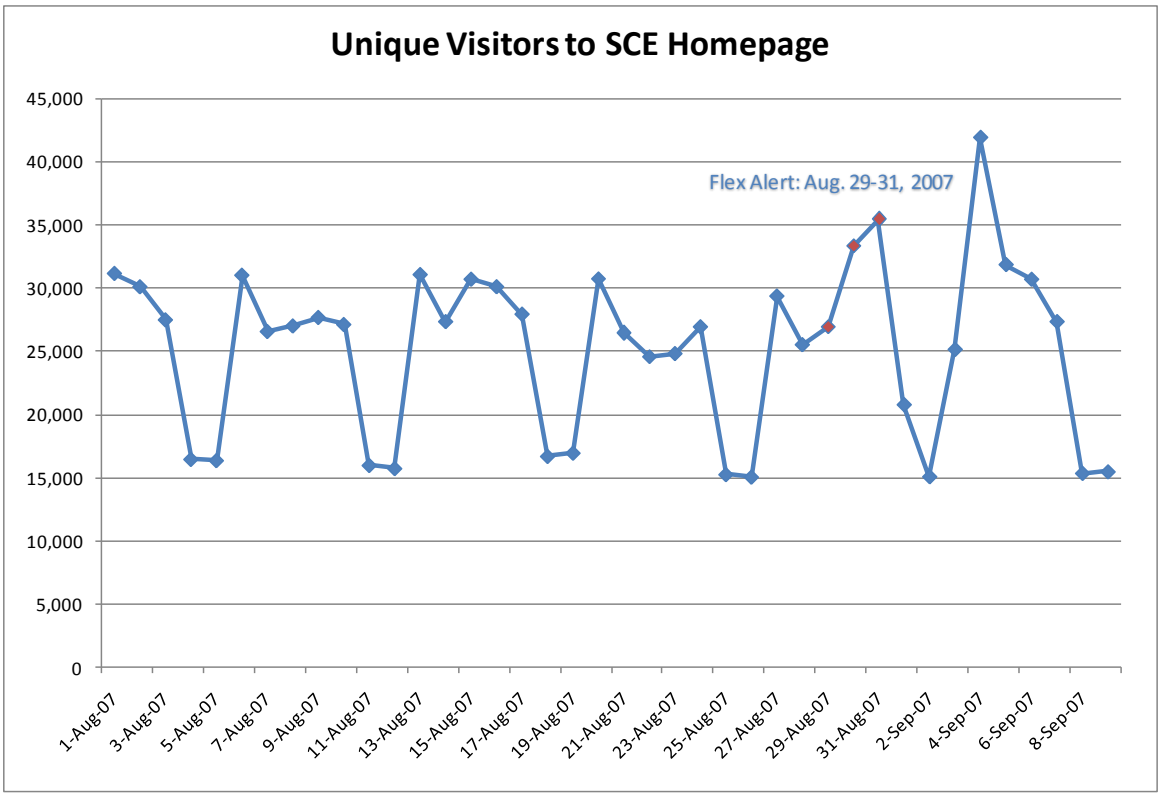
Figure -. Daily Page Views on SDG&E Homepage, August 2007



Southern California Edison Website (www.sce.com)

During the August 2007 Flex Alert, daily visits to the SCE website increased slightly over typical levels. Generally the highest traffic to the website came on Mondays, with just over 30,000 daily visitors; on the second and third days of the Flex Alert traffic climbed to roughly 33,000 and then over 35,000 daily visitors. After a dip in traffic over the Labor Day weekend, visits to the website spiked to over 40,000, most likely due to the extreme heat wave that continued in Southern California *after* the Flex Alert was lifted. Figure - displays daily visits to the SCE homepage from August through early September 2007.

Figure -. Daily Visits to SCE Website During August and Early September 2007



During the Flex Alert, the SCE homepage referred visitors to the www.sce.com/heat page for conservation tips and to learn more about the Flex Alert. Over the three-day Flex Alert period in August 2007, 1312 visitors to SCE.com clicked through to the Heat page to learn about the Flex Alert, or approximately 1.4% of the 95,828 total visitors to SCE.com during that period (Table -).

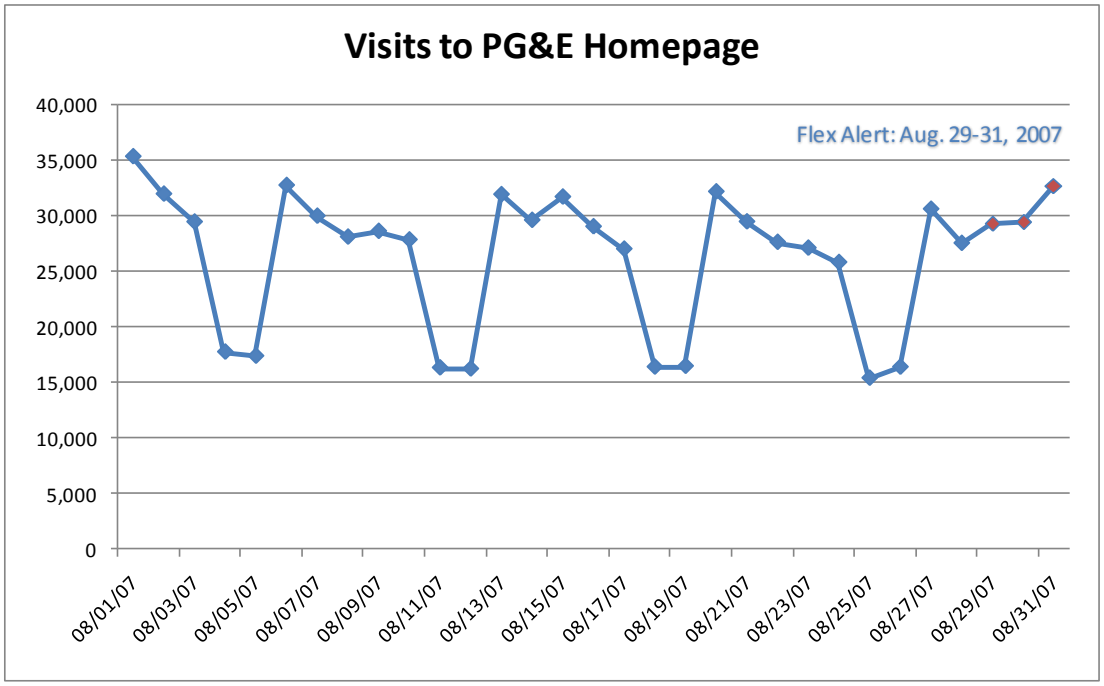
Table -. Visits to SCE.com and SCE.com/heat During Flex Alert

Date	# of Visitors to SCE.com	# of Visitors to SCE.com/heat
8/29/07	26,987	342
8/30/07	33,398	531
8/31/07	35,443	439
3-Day Total	**95,828**	**1312**

Pacific Gas and Electric Website (www.pge.com)

As shown in Figure -, daily visits to the PG&E homepage increased slightly during the August 2007 Flex Alert. While in previous weeks, daily visits peaked on Mondays at roughly 32,000 visits per day and declined over the rest of the week (until spiking up on Mondays again), during the Flex Alert period, daily visits actually increased from Wednesday to Friday to a weekly high of roughly 33,000 visits.

Figure -. Daily Visits to PG&E Website During August 2007



3.3.3 Media Coverage of Flex Alert Days

Phrases Used to Describe Event

A review of news stories (print and video) posted on the websites for the major NBC, ABC, CBS, and FOX affiliates in the four largest metropolitan areas (along with the biggest newspapers) revealed that very few media outlets used the phrase "Flex Alert" when reporting on the CAISO's (and/or utilities') request for energy conservation on the Thursday of the Flex Alert (August 30, 2007). Only the ABC affiliates in Los Angeles and Sacramento and the CBS affiliates in San Diego and Sacramento used the phrase "Flex Alert" at all (in bold red in Table - below). No San Francisco media outlet used the phrase "Flex Alert". More common was the phrase "power alert", used by eight media outlets (in blue italics in the table); also, some variation on "power emergency" or "stage 1 emergency" was used frequently.

Table -. Phrases Used by Media to Describe Calls for Energy Conservation on Thursday

	NBC	ABC	CBS	FOX	Newspaper
San Diego	*"power alert"*	"stage 1 alert" possible	**"power flex alert"**	*"power alert"*	*"power alert"*, "stage 1 emergency"
Los Angeles	*"power alert"*	**"Flex Alert Day"**	"stage 1 alert" possible	*"power alert"*	"electrical emergency", *"stage 1 power alert"*
Sacramento	"stage 1 power emergency" expected	**"stage 1 Flex Alert", "Flex Your Power Day"**	**"Flex Alert Day"**	*"power alert"*, "stage 1 emergency"	"stage 2 emergency"
San Francisco	*"power alert"* - "the entire state is under a power emergency"	"stage 1 alert"	"minor power emergency", "stage 2 power emergency"	"minor power emergency", "stage 2 power emergency"	"stage 2 emergency"

TV Coverage

Summit Blue reviewed videos available on various local TV networks' websites and textual news stories posted there, and also digitally recorded TV news broadcasts in the San Francisco region. As described in the section above, TV news broadcasts used many different terms to describe the requests for conservation; few actually used the term "Flex Alert". However, in spite of the inconsistencies in terminology, the TV news broadcasts that did report on the need for conservation were generally consistent with the Flex Alert *message* in terms of conservation actions promoted and CAISO's requested hours for conservation (4:00 to 6:00 PM).

Of the ten digitally recorded TV news broadcasts (all in the San Francisco region) on Tuesday through Friday of the August Flex Alert period, only one actually mentioned the Flex Alert by name. No paid Flex Alert advertisements ran during the commercial breaks of any of the Tuesday or Wednesday TV broadcasts reviewed; on Thursday, the paid commercial ran during two of the three recorded news broadcasts.

The Summit Blue team reviewed video and print news stories posted on the websites of the major network affiliates (NBC, ABC, CBS, and FOX) in other California regions, particularly in San Diego, Los Angeles, and Sacramento. The San Diego TV news websites gave the energy conservation story the most prominence, likely because SDG&E had been actively promoting energy conservation during the heat wave, in addition to the Flex Alert campaign. Despite the prominent placement of energy conservation stories, there was significant variation among the San Diego TV news affiliates' in how they phrased their headlines. The CBS affiliate's website showed a large graphic with the headline "Southern Californians Urged to Cut Back on Electricity", which was a good choice of wording; the NBC affiliate's website had a red alert banner at the top of the page that read "Officials declare Stage 1 Power

Emergency". While the red alert banner really drew attention and highlighted the "alert" aspect of the message, an improved banner might read: "Officials Declare Flex Alert; Energy Conservation is Needed." On many of the news websites reviewed, the news media simply stated that officials have called a "Stage 1 Power Emergency" or some variation of that without explaining the term or accompanying it with the call for voluntary conservation; one has to click through to the article itself (or watch the video) to understand that what the "officials" are really declaring is a Flex Alert call for energy conservation.

A video newscast available on the Sacramento ABC affiliate's website demonstrated several widespread problems with the media representation of the Flex Alert. For starters, the reporter emphasized that the CAISO says that there *is* enough power: "We want to conserve to make sure there aren't any shortages. Right now there aren't any shortages." This weakens the sense of urgency of the Flex Alert. Then the reporter discusses swapping out old lightbulbs for CFLs, applying for rebates for energy-efficient appliances, and other long-term energy *efficiency* upgrades, rather than keeping the focus on *conserving today*. While the key Flex Alert actions (turning off unused lights, adjusting thermostat, waiting until 7 PM to use major appliances) are mentioned, the conservation message is muddled with an energy efficiency message.

Message from the Governor

During the Flex Alert period, the San Francisco NBC affiliate's website (www.nbc11.com) posted a story related to the heat wave and included a link to an audiocast by Governor Arnold Schwarzenegger. The governor stated: "I just want to say that yes, you know, we have a heat emergency in effect right now, which means that people should do everything they can in order to protect themselves. If it is using cooling centers that are open now, then working with local officials to protect the vulnerable citizens, if it is drinking plenty of water which is another important thing, you know, stay indoors as much as you can and check on your neighbors, family, and pets. *Also, Flex Your Power is very important because we only have a certain amount of energy, because we haven't built all the generators and all the power plants yet that we need.* So this is why I think it is very important that California people have been very, very helpful in flexing their power and reducing and using conservation. I think that it's important that you turn your thermostat down to 78 degrees or up, whatever it is, it is important. Turn off unnecessary lights and avoid using major appliances until 7:00 this evening." On a positive note, the governor promoted the correct energy conservation actions and commended the people of California for doing their part (making it sound like a social norm); however, the statement that "we haven't built all the power plants yet that we need" seems to undermine the normative message that there is a need for all Californians to do their part.

Newspaper Coverage

Summit Blue reviewed news stories that appeared in the major California newspapers during and immediately after the Flex Alert period. As discussed previously, different newspapers used different phrases to describe the event; few used the phrase "Flex Alert". The requests for conservation generally were mentioned in articles about the weather and were rarely accompanied by conservation tips. Most of the articles included quotes from CAISO spokespeople, but few included quotes from utility spokespeople. Most of the quotes were quick to emphasize that rolling blackouts were not expected.

San Diego Union-Tribune

The San Diego Union-Tribune had the most extensive coverage of the Flex Alert, out of the three major newspapers reviewed. The San Diego Union-Tribune published an Associated Press story on August 29th titled "Electricity demand highest of summer: Conservation urged over coming days." The article discussed the weather conditions that led to the high electricity demand, the problems with obtaining

additional generation, and then stated, "The California ISO has declared Wednesday and Thursday "Flex Alert Days," and is urging residents to conserve electricity, especially during the peak hours of 4:00 p.m. to 6:00 p.m. While reducing air conditioning use is one way to conserve energy, the ISO says people whose health could be compromised should not put themselves at risk. Among the tips the agency suggests: Set thermostats at 78 degrees or higher; cool with fans; turn off unnecessary lights and use big appliances in the early morning or late at night." As of 4:00 PM Wednesday, the website for the San Diego Union-Tribune (SignOnSanDiego.com) prominently featured the call for conservation. The headline read 'Californians urged to switch off: A mid-week heat wave has California power officials urging residents to limit their use of electricity." The website also gave a link to the CAISO website's forecast and actual demand data.

After the Flex Alert period was over, the calls for conservation continued to appear in the newspaper, this time requested directly by SDG&E. On September 4th, an Associated Press article titled "Two dead and many without power as SoCal heat wave continues" reported that SDG&E had "declared a power emergency and began preparing for potential rolling blackouts as demand hit a record level." SDG&E spokesperson Peter Hidalgo was quoted as saying "We need immediate energy conservation, or else there will be rolling blackouts." The coverage continued on September 5th with an article by a Union-Tribune staff writer titled "Some suspect SDG&E cried wolf during heat wave." The article noted that more 81,000 SDG&E customers (or 1 in every 17 meters) lost power at some point during the Labor Day weekend, but says that the outages were caused by lightning strikes and equipment failures, not lack of electricity. The article states that SDG&E officials warned of a "very real threat of a Stage 3" power alert, despite the fact that only the CAISO has the authority to issue such an alert, and alleges that some consumer advocates believe that SDG&E deliberately misled the public to gain support for a controversial transmission line. Another article appeared on September 6th titled "SDG&E scolded over use of alerts: Blackout warnings weren't authorized." The article described SDG&E's lack of authority to warn the public of possible blackouts and quoted Stephanie McCorkle of the CAISO as saying, "We want to be accurate in describing the condition of the power grid. Overuse (of warnings) can lead people to ignore us when we really need conservation and it affects all of California." Finally, on September 8th, CAISO spokesperson Stephanie McCorkle wrote a letter to the editor expressing the opinion that the strong reactions to SDG&E's claims had overshadowed what should have been a thumbs-up for Californians who did their part by conserving energy during the Flex Alert, and explained that while the CAISO had not issued a statewide alert, SDG&E did have local transmission constraints that made conservation necessary.

Los Angeles Times

During the August Flex Alert period, the Los Angeles Times featured several articles about the heat wave creating a need for electricity conservation, but used the phrase "stage 1 power emergency" rather than "Flex Alert." The most prominent headline on the Los Angeles Times website on Wednesday at 4:00 PM was "Heat wave spawns stage 1 power emergency: Power demand exceeds expectations, and energy officials ask consumers to cut demand." The article says, "Though blackouts are not expected, the power agency has asked Californians to voluntarily reduce electrical use today and Thursday, particularly during the peak hours of 4 p.m. to 6 p.m." and then discusses the weather forecast.

A September 5th Los Angeles Times article titled "14 deaths blamed on S. California's unrelenting heat" discussed the heat-related deaths and went on to discuss the power outages which happened *after* the Flex Alert period, which SCE spokesman Paul Klein said were due to equipment failures, not power shortages. The article then stated that "Near-record demand was causing transformers to pop and other electrical equipment to fail." Another Los Angeles Times article on September 5th titled "Miserable without electricity" provided some interesting anecdotes about the conditions in which Southern Californians found themselves during the blackouts that happened after the Flex Alert period. A Los Angeles resident

was quoted as saying, "I feel like I'm in a Third World country. My wife is doing dishes in a pail. I can't get the electric gate open to get my car out. We can't even light too many candles at night because it just adds to the heat in the house." This statement is consistent with FYPN focus group findings in which several participants used the same "Third World country" analogy when describing the strong emotional reactions to blackouts.

San Francisco Chronicle

The coverage of the Flex Alert was scarce in the San Francisco Chronicle, which was far more focused on the concurrent Spare the Air Day. The most prominent heat wave-related article in the San Francisco Chronicle (as displayed on SFGate.com on August 29th) was primarily about the Spare the Air Day advisory and free public transit. The final two paragraphs of a lengthy (15 paragraph) article read, "State electricity monitors also urged Californians to conserve energy and reduce air conditioner use during the late afternoon peak hours. The California Independent System Operator declared "Flex Alert" days for today and Thursday. A spokesman said no shortages were expected but asked Californians to shift energy use to off-peak hours anyway."

On August 30th, an article by a staff writer titled "State dodges power problems, thanks to conservation" appeared in the Chronicle. The article stated that voluntary conservation allowed the CAISO to avoid declaring stage 1 and stage 2 alerts and cutting off power to large energy users, which they anticipated needing to do that day. Stephanie McCorkle of the CAISO was quoted as saying, "We saw in excess of 1,000 megawatts of conservation on the grid today…The demand just fell off quite dramatically." The article ended by saying that the CAISO was requesting one more day of conservation, recommending "setting thermostats at 78 degrees or higher, turning off pool pumps and avoiding outdoor watering during peak hours." Stephanie McCorkle was quoted as saying, "This is the cheapest, cleanest way to meet high demand on the grid." The term "Flex Alert" was not used in the article.

3.3.4 Conclusions from Qualitative Review of Flex Alert Promotion and Coverage

Summit Blue's qualitative review of the August 2007 Flex Alert event revealed some missed opportunities, primarily related to coordination of efforts and messages between various entities:

- There are significant inconsistencies with the terminology of the alert; better coordination of the message (including the term for the alert and the logo used) among the Flex Your Power campaign, the CAISO, the news media, and especially the utilities would reduce confusion. In addition to wildly varying names for the alert itself (Flex Alert, Flex Your Power Day, Power Watch, Electrical Emergency, etc.), the full range of Flex Your Power logos were used by various utilities and media outlets (Flex Your Power, the old Flex Your Power Now, and the new Flex Alert: Save Energy Now logos).

- The utilities' websites could support the campaign better and should all clearly and prominently identify that the day is a Flex Alert, use the most up-to-date version of the logo, and promote similar conservation actions as much as possible.

- Media attention on the Spare the Air Day significantly overshadowed the coverage of the Flex Alert in the San Francisco area; perhaps better coordination between the two campaigns would allow the messages to be complementary rather than competing for air time.

- Some media outlets confused the Flex Alert campaign with direct load control programs, rolling blackouts, and even energy efficiency (not conservation) programs. CAISO and utility representatives who write press releases or otherwise have contact with the media should be encouraged to take the opportunity to explain the concept of the Flex Alert campaign and emphasize that when people see Flex Alert ads or messages, they should take voluntary conservation actions *on the day of the alert*.

- The media had a tendency to emphasize the fact that "officials" are declaring an "emergency" and downplay the request for conservation on the part of ordinary Californians. Readers/viewers should feel *empowered* to take conservation actions rather than just *forewarned* that there's a problem with the grid. CAISO and utility representatives should also stress the usage of the more consumer-friendly "Flex Alert" phrase rather than "Stage 1 Electrical Emergency", which is what many media outlets ultimately used to describe the event.

- The CAISO website did not include any energy conservation tips or links to more information (on the FYPower.org site, for instance) and news media websites were providing links to the CAISO website rather than the FYPower.org website. Additional coordination could be helpful here.

- SCE's "Conservation is always in season, especially on hot days" tagline conflicts with the concept of an alert, suggesting continuity of practices rather than new conservation actions required to mitigate current dire circumstances. The invitation to "learn more" (link) further underscores the long-term education rather than short-term emergency scenario. Perhaps 'What to Do Now" would be a better choice.

4. CUSTOMER AWARENESS AND RESPONSE

This section discusses the results of the focus groups and three survey efforts. The focus groups (discussed in Section) concentrate on consumers' qualitative reactions to the FYPN message and ads and their willingness and ability to comply with the requests for conservation. The three survey efforts (baseline, post-event, and post-summer) are presented in Sections , , and , respectively, and provide a more quantitative understanding of Californians' awareness of the FYPN effort, specific recall of Flex Alerts, actions taken in response to the alerts, and other topics. Finally, Section presents the major conclusions of the focus groups and surveys, including changes in FYPN awareness and recall over the time span of the three survey efforts.

4.1 Focus Groups

Summit Blue collaborated with Braig Consulting for their expert consumer psychology and marketing qualifications to conduct three focus groups in California on June 12-14, 2007, as part of the larger Flex Your Power NOW! evaluation efforts. See Section for more details on the focus group methodology.

The overall goals of the focus groups were to get a qualitative read on consumer opinions of the FYPN advertisements from 2006 and the recently completed 2007 spots. The focus groups were not used to measure awareness of FYPN, but rather to gain a richer sense of knowledge of and response to the FYPN program, and to provide context for the quantitative survey efforts that followed. Although several consistent themes arose as a result of the three focus groups, it must be emphasized that the results are *qualitative.*

4.1.1 Awareness of FYPN Logo

Nearly 100% of focus group participants recognized the 2006 FYPN logo (shown above left). However, most did not correctly associate the FYPN logo with the FYPN program. For example, most in the Los Angeles group felt it referred to the air conditioning cycling program, and other groups were also unclear about what program the logo applied to. Participants also largely lacked accurate knowledge of how the program worked:

- *"It's a reward program that gets you Starbucks gift cards. They shut off your power at random times for some interval."*
- *"I associate it with air conditioning, especially in heat waves."*

Some also linked FYPN to newsletters contained in billing statements with general tips and ideas on how to save energy and/or information on high-efficiency appliances. It is likely that participants were actually recalling the Flex Your Power logo on the billing statements. Consumers appear to associate FYPN with energy-saving activities more consistent with the Flex Your Power efforts.

The phrase "Flex Your Power Now" resonated, even if specific knowledge of what it meant was thin. One participant said, "It's a strong statement. Very empowering actually – Flex Your Power – like you get to decide whether to conserve and save."

4.1.2 Reactions to 2006 Messages

It is important to recall that viewing advertisements in a focus group facility is not a natural viewing environment, and as a result, the setting likely heightened the cognitive attention devoted to processing the message. The purpose of the focus group discussion was to obtain greater depth, reasoning, emotion, and richness of insight in response to communication content and tone.

The 2006 alert ad (animated appliances) generated the most negative reactions both in terms of message content and tonality. With the substantial clutter of the ad, many came away with no real content at all. They lost the emergency/alert aspect, and, as a result, the perceived benefit and motivation also fell short.

- *"I came away with anthropomorphic appliances, and a sense of urgency."*
- *"Psycho vacuum attacks."*
- *"It was more entertaining than informative. It reminded me of the Pixar lamp."*
- *"It was so cluttered and there was so much going on. I couldn't decide where to focus my attention."*
- *"This might get the kids' attention, but I would have walked right on by if I saw this on TV."*

4.1.3 Reactions to 2007 Messages

Across all three ads shown to the focus group, the dominant interpretation was that the requests were for long-term lifestyle changes, not a short-term alert. Slight variability existed, though, with the 2007 alert message as the most effective of the three at conveying the urgency of the short-term power emergency. However, even with the red background, reference to state officials calling an alert, and phones ringing in the background, most still believed that the requested actions were for the long-run. Reference to global warming in the closing line reinforced this long-term concept. Consumers observed that global warming clearly signified a longer-term impact, not a short-term crisis.

Despite confusion over the intended time horizon of the requested behaviors, the desired actions are coming across quite clearly. Several people noted that the three actions have been driven home for years – in articles in the newspaper, billing statement messages, and other unidentified sources. Many also credit Mom and Dad for knowledge about energy-related habits and their value. Most people felt like the requested actions felt like common sense and logic at this point. Many appreciated the icons in the 2007 alert message which offered a nice visual mnemonic. Further, the icons (see below) and detailed suggestions prompted some to think about other things they could do.

- *"I feel like I should walk around the house and find other things that I could turn off. The DVD player, computers, other little things you leave on all the time."*

The 2007 thank-you/education spot (blue) provided a rationale for why "saving energy immediately" and the inferred behaviors were important. Offering this rationale for the request differentiated it from the 2006 spot, which was an actual alert. The 2007 blue educational ad also excelled at communicating the negative consequences of lack of compliance/participation compared to the 2006 spot. Most people inferred the specific actions based on the message – again, the trigger of "it's vital to conserve energy" and "saving energy" for the sake of global warming seems to hit already engrained actions.

They contrasted the 2007 red vs. blue spots:

- *"The blue is about keeping up the good work, but knowing that there is more coming."*
- *"Blue is motivating and encouraging."*
- *"The red feels more like panic mode, but it is not asking you to do anything different than the blue one is asking."*
- *"Red feels less optional, like it required immediate action."*

4.1.4 Understanding of Benefits and Consequences

As noted previously, the positive benefits and negative consequences are all but lost in the 2006 appliances ad. The newest 2007 communications are far more effective in conveying both benefits and consequences. However, even in the 2007 ads, the majority of focus group participants could not differentiate between the alert and the educational messaging, nor did they understand that an alert required immediate action.

Perceived benefits of "saving energy" by engaging in specific behaviors over the long term had long and wide-reaching impacts for most. When asked who benefited from energy-saving actions – even in the short term, most extended these benefits to all people who draw from the energy source. However, most pushed these benefits beyond California, with some arguing that power grids across the West are connected.

- *"Our behavior or emergencies could shut everyone (in the West) down."*

Further, most also expanded the impact of modifying behaviors to future generations, observing that long-term commitment to energy conservation would reduce or even eliminate global warming.

The participants' observations on the ramifications of not "saving energy" per the FYPN spots were numerous and ranged from functional and minor inconveniences to more emotionally intense vulnerabilities associated with powerlessness (pun intended). Particularly for those who survived previous blackouts in California and New York, blackout conjured associations to Third World countries along with chaos and uncertainty.

- *"It's really disruptive to life overall. There is a lack of stability."*

- *"We've all experienced it, and it's a true natural disaster."*
- *"You think it won't be a big deal, but then it slowly sinks in all the things you can't do, and it gets more stressful."*
- *"We really will lose the choice. We can choose now, but if there's a blackout, we have no choice."*

Consumers offered their own "benefit stories" for the FYPN program. The derived consensus story provides interesting insights into how to position FYPN for a fuller range of consumers – from the environmentally ambivalent to the more passionate advocates for renewable energy. The most compelling umbrella benefit for FYPN is "saving." Note that this conclusion is somewhat difficult to process in that the ads do request consumers to "start *saving energy* immediately" and remind us that it's "vital to conserve." Energy professionals know that deferral of energy consumption off peak, particularly with regard to AC, can lead to significant snap-back effects such that energy may not technically be "saved." Thus, for reasons of truth in advertising, a promise of saving money cannot be used even though this is how consumers think of these issues. However, the use of phrases like "saving energy" and "conservation" used in the ads appear to be as consistent as possible with how consumers conceive of the requested actions without more technical phrasing. Even after education on what the spots were designed to do, the story these consumers told reflects their belief system on resources and energy.

- *In order to save, people need to conserve energy. In return for conserving energy we reap short-run rewards with cost savings and no blackouts. Saving done right also allows us to preserve resources in the long-run.*

4.1.5 Consumer Preferences for Message Delivery

Consumers were asked to discuss who they wanted to deliver the FYPN message. Who should issue the alert? The message source issue, however, is linked strongly to choice of media. The source lends credibility to the alert or warning, and the choice of media enables the opportunity to act. Both are required to spur participation.

The most compelling source was news anchors. Making the alert a newsworthy event, one that is potentially augmented by public service announcement (PSA) news crawls on the bottom of the TV screen, was viewed as a means for reinforcing the criticality of the power situation.

Strong authorities such as the governor of California or local elected officials (mayors) were also viewed as sources that would command attention. The ideal messenger for the alert news was a news report that featured a pre-recorded message from Governor Schwarzenegger or another official. Although there was some push back from the San Francisco group who wished to have a "politically and financially neutral source," the spirit behind the recommendation still stands – someone in a position of strong authority in the government or from the utilities themselves commands attention and notice to the alert message.

The assumed media challenge is to put the alert news in front of consumers when they are in a position to act upon the requested actions. However, consumers offered that if they received the alert on the way home, they would either call from their car to someone at home or it would serve as a reminder to do something when they got home. Given that the drive home is a key transition for most working people, an alert message that requested action at that time could be acted on (possibly later than desired). Consumers are already shifting to a new mode on their way home, making compliance more likely. Hence, radio and highway amber alert signs were named as the most appropriate media vehicles for last-minute messages.

Television was preferred, but most admitted that this would not be practical in many cases. Other methods suggested included email/text messaging. However, our consumers in this target admitted that these modes were likely to be less used than radio and highway signs.

4.1.6 Conclusions from Focus Groups

As noted above, the focus groups were intended to provide qualitative insights into the effectiveness of program communications and potential improvements to the program. The following bullets highlight the key findings of the focus groups.

- The majority of consumers did not understand that the behaviors requested in the FYPN ads applied to a given alert day; though some regional variation did exist (the San Francisco focus group showed better understanding of the alert aspect of the program). Most believed that the actions described represented long-term lifestyle changes, not emergency actions needed on specific days. The color red in the 2007 alert did indicate danger, but the ad still did not adequately convey sufficient time specificity.

- The San Francisco focus group readily understood the alert day concept, unlike the Los Angeles and San Diego focus groups. One hypothesis is that participants already understand a somewhat similar Spare the Air program run by the Bay Area Air Quality Management District. Hence, consumers may already be familiar with the notion that on certain "bad days," different behaviors are requested and that compliance with these requests is important.

- After the alert concept was explained, when participants were asked to tell the FYPN "story" in their own words, most told a story that indicated if more people changed long-term behavior, this would eliminate the need for short-term alerts. This story was consistent with the dominant belief of the groups that the benefits of adopting these behaviors long-term extend well beyond California and well beyond the current generation.

- The "California pride" element of the 2007 blue thank-you/education spot appealed to most people's belief that everyone had to do their part; one person summed up that sentiment as: "A little bit of action on the part of a lot of people brings down the costs for everyone." Consumers use phrases such as "doing your part" and "doing the right thing" to describe incorporating the requested behaviors into one's daily life.

- There was full comprehension of the actions requested. For many, the three actions (thermostat to 78 degrees, no major appliances until 7 PM, and turn off unnecessary lights) were so engrained as "appropriate behavior" that the ads did not need to name them. Consumers inferred them when the communications used the phrase "save energy."

- Seriousness is required to emphasize the gravity of the situation faced if an alert is truly called. If humor is to be used, it should be focused on getting the viewers' attention, not directed at the message itself and the consequences of inaction. Most believe that managing energy resources was a critical issue—even those growing weary of the global warming drumbeat. The gravity of conservation efforts should extend to the tonality of the communications and word choice. Hence, the word "alert" was not strong enough for most. The phrase "at maximum capacity" resonated strongly with consumers, providing a more emphatic pronouncement that the state is on the edge of losing power.

- For the environmentally aware and interested, the FYPN program and communications were highly consistent with consumers' own beliefs and even passion for preserving resources and paving the way

for additional energy source options, such as renewable power. Many indicated that they already felt they were doing all that they could in the way of conservation.

- Although alerts cannot always reach people when they are in a position to comply, the best ways to reach people on their way home were highway signs ("amber alert" signs), radio, and (for some) email or text messaging.

- The serious alert message requires a serious source delivering the news. If it is truly an alert day, consumers want there to be a news story or public service announcement-type message to reinforce the criticality of the situation, some suggested that it would be appropriate to get a phone call or pre-recorded message.

4.2 Baseline Survey

This section discusses the results of the Flex Your Power NOW! baseline survey conducted as part of Summit Blue's evaluation of the 2006-2007 Flex Your Power NOW! (FYPN) program. Two surveys—one via telephone, one via a web-based interface[28]—were conducted between May 22nd and June 29th, 2007. The telephone surveys were conducted by Northwest Research Group (phone) and obtained 1122 completes, and the web surveys were conducted by Vovici and obtained 1260 completes. While this section does include both web and phone survey results side by side, these results are not intended to be used for comparison per se. Here we have included both the web and phone results to provide the full range of likely results; however, to facilitate comparison to subsequent phone surveys, the analysis focuses on the results of the phone survey.

The baseline survey instrument was modified from the survey instrument used in the previous evaluation of FYPN conducted by Opinion Dynamics Corporation (ODC). Where appropriate, comparisons to the previous ODC baseline survey results are made in footnotes.[29]

The appendices contain demographic data on the baseline survey respondents (Section)

4.2.1 Familiarity with Flex Your Power and Other Energy Conservation Programs

Unaided, 37% of web respondents indicated that they were aware of energy conservation programs/campaigns in California. Many of these respondents were able to name multiple programs (unprompted), including Flex Your Power (6% of respondents), Energy Star (5%), and the 20/10 program (1%); others could not recall the specific program name but described campaigns that provided rebates for efficient appliances or promoted CFLs, efficient appliances, renewable energy such as solar or wind power, A/C cycling, and other related campaigns. Just one web respondent mentioned Flex Your Power

[28] In the final March 29, 2007 workplan, Summit Blue indicated that if the web and phone surveys had good comparability, post-event surveys would be conducted by web, as web surveying is somewhat more cost-effective. If, however, the results differed, the post-event surveys would be conducted by phone, to better facilitate comparison to previous evaluation surveys which were also conducted by phone. Summit Blue found meaningful and statistically significant differences between the results of the phone and web baseline surveys; thus, subsequent survey efforts were conducted by telephone.

[29] Opinion Dynamics Corporation. *Process Evaluation of the 2004/2005 Flex Your Power NOW! Statewide Marketing Campaign: Final Integrated Report*. July 24, 2006. All references to previous ODC baseline survey results were obtained from this report.

NOW! by name, but 2% of respondents described the Flex Your Power NOW! campaign (e.g., "only use appliances during OFF peak hours to conserve energy").

Phone respondents had similar recall of other energy conservation programs; 39% said that they were aware of at least one energy conservation program or campaign. Most often phone respondents mentioned rebates for energy-efficient products (7%), promotions of energy-efficient appliances (5%), CFLS (4%), or renewable energy (4%); other common responses were related to Energy Star (2%), 20/20 or 20/10 programs (2%), A/C cycling programs (2%), Flex Your Power (1%), or general conservation actions. Not one phone respondent recalled Flex Your Power NOW! or Flex Alerts by name, but 1% of respondents described the Flex Your Power NOW! campaign's requested actions.

Respondents were reasonably familiar with the phrase "Flex Your Power". 40% of phone respondents and 48% of web respondents rated their familiarity with the phrase as "very familiar" or "somewhat familiar."

Just 2% of phone respondents and 3% of web respondents reported that they had ever visited the Flex Your Power website.

38% of phone respondents and 55% of web respondents recalled seeing a Flex Your Power advertisement.[30] This discrepancy may be due to a visual prompt effect from the web survey. We note also that during the focus groups, participants immediately recognized the Flex Your Power NOW! logo, which is very similar to the Flex Your Power logo, but it was clear that they were not distinguishing between FYP and FYPN and that they often thought the logo related to other, unrelated programs. What is noteworthy is that phone survey respondents in the larger designated market areas (DMAs)—where the majority of FYP messaging is focused—did show a significantly higher level of recall than in the smaller DMAs; in the web survey, the differences between large DMAs and small DMAs was not statistically significant.

Table -. Recall of Flex Your Power Advertisements – by DMA Size

% Who Recall FYP Ad	Phone	Web
Large DMAs	40%	55%
Small DMAs	35%	56%
Total Confidence Interval @ 90%	**38%** 36% - 40%	**55%** 53% - 57%
Statistics *Chi-Square* *df* *Asymp. Sig.*[31]	 *5.330* *2* *.070*	 *0.922* *2* *.631*
Note: the difference between large and small DMAs *was* statistically significant at the 90% level for the phone survey, but was *not* significant for the web survey.		

Of those respondents who saw/heard an ad, 63% of phone respondents and 73% of web respondents reported doing something to change their electricity usage or purchasing lower energy use equipment.

[30] The results reported here are in line with the previous ODC baseline survey result of 42% recall.

[31] A note on statistics used: any time the "asymp. sig." statistic is *under* 0.10, the comparison is statistically significant at the 90% level.

This translates to 23% of *all* phone respondents and 40% of *all* web respondents taking action in response to a Flex Your Power advertisement.

It appears that some respondents who claim to recall Flex Your Power advertisements may be actually thinking of Flex Your Power NOW! When asked what the term "Flex Your Power" makes them think of or what actions they took in response to seeing a Flex Your Power ad, some responses indicated that respondents were really thinking of Flex Your Power NOW! Review of the verbatim results indicated that approximately 8% of web respondents and 4% of phone respondents mentioned some variation on "use appliances after 7 PM" or "conserve energy during peak hours." Additionally, 17% of web respondents and 9% of phone respondents mentioned conservation *behaviors* (as opposed to purchasing energy-efficient products, which is the primary focus of the FYP campaign) without a specific mention to the time of day. This further indicates that the FYPN message is frequently being attributed to the FYP campaign.

4.2.2 Flex Your Power NOW!

Familiarity and Recall of FYPN Messaging

Just 15% of phone respondents and 21% of web respondents rated their familiarity with the phrase "Flex Your Power NOW!" as very or somewhat familiar.[32] Respondents in larger DMAs showed no higher familiarity with the phrase than those in smaller DMAs.

Table -. Familiarity with Flex Your Power NOW! Phrase – by DMA Size

% Who are Very or Somewhat Familiar with Phrase	Phone	Web
Large DMAs	15%	21%
Small DMAs	15%	20%
Total	**15%**	**21%**
Statistics		
Chi-Square	*2.436*	*1.262*
df	*4*	*3*
Asymp. Sig.	*.656*	*.557*
Note: the differences between large and small DMAs were not statistically significant in either the phone or web surveys.		

Thirteen percent of all phone respondents and 18% of web respondents[33] recalled seeing a Flex Your Power NOW! advertisement.[34] Figure - compares phone respondents' recall of FYPN advertisements by DMA size, target audience, and pro-environmental psychographics. Respondents in the four largest DMAs (where FYP and FYPN messaging is concentrated) had slightly higher recall of FYPN ads than those in the smaller DMAs, but the difference was not statistically significant. Likewise, the slight difference between members of the target audience (college-educated female homeowners) and all others

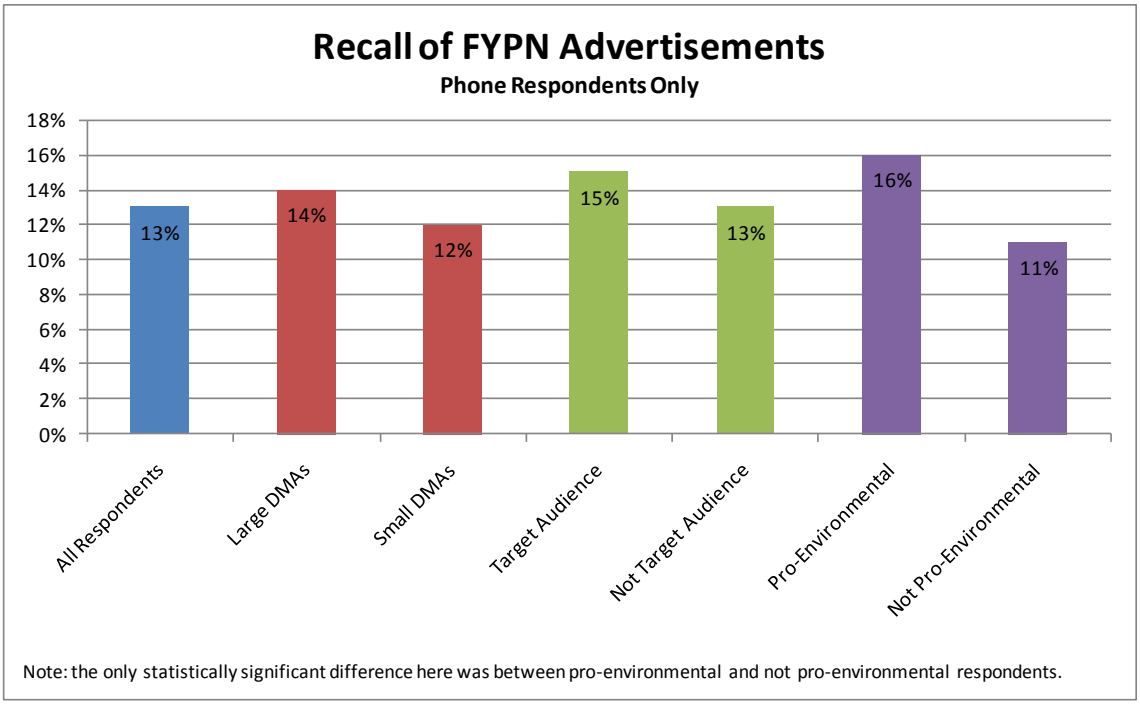
[32] The previous baseline survey conducted by ODC found that 20% of respondents were very or somewhat familiar with the term "Flex Your Power NOW!"

[33] The 90% confidence intervals range from 11% to 15% for phone respondents and 16% to 22% for web respondents.

[34] The previous baseline survey conducted by ODC found that 12% recalled seeing a FYPN ad.

(15% vs. 13%) was not statistically significant.[35] However, respondents who demonstrated strong pro-environmental opinions (based on a series of psychographic questions) showed a statistically significant higher recall of the FYPN advertisements (16% vs. 11%) compared to all other respondents. These results indicate that the FYPN messaging is reaching the environmentally conscious consumers that are thought to be more willing to conserve, although the overall level of recall of FYPN messaging is relatively low.

Figure -. Recall of FYPN Advertisements



The majority of respondents reported seeing the FYPN ad on television (64% of phone respondents, 70% web) Radio was the second most common source of the FYPN ad (32% phone, 33% radio).

Behavior Change in Response to FYPN Messaging

Over half (56%) of the phone respondents who saw a FYPN ad reported changing their behavior in response to the ad; 68% of web respondents said the same.[36] The target audience (college-educated female homeowners) does appear to be more likely to change their behavior in response to the FYPN ads (63% of phone respondents in the target audience took some sort of action in response to the ad they saw, as compared to 53% of all others), but the sample sizes in this comparison were too small to be statistically significant.

Given that 13% of phone respondents and 18% of web respondents recalled seeing a FYPN advertisement as presented earlier in this section, 7% of *all* phone respondents and 12% of *all* web respondents reported seeing a FYPN advertisement and changing their behavior in some way in response to it.

[35] The survey sample was designed to provide a cross-section of Californians, not to reach high numbers of the target audience, to better extrapolate results to the general population. Thus, the sample sizes for the target audience comparisons were quite low, rendering statistically valid comparisons difficult.

[36] The 90% confidence intervals range from 53% to 59% for phone respondents and 63% to 73% for web respondents.

Most respondents who reported changing their behavior in response to FYPN messaging mentioned shutting off unused lights or electronics (3% of all web and phone respondents) or adjusting the thermostat (2% web, 1% phone). However, fewer respondents (3% web, 2% phone) specifically mentioned conserving during peak times or waiting until after 7 PM to use appliances, when compared to the responses to the equivalent question for Flex Your Power. In addition, there were some that mentioned unrelated actions such as "rebates for old refrigerator," "[installing] motion sensor," "don't wash in the mornings," etc.

4.2.3 Flex Alerts

Familiarity with Flex Alerts

Very few respondents had any familiarity with the phrase "Flex Alert." Table - presents the percentages of respondents who were very or somewhat familiar with the phrase, by DMA size. Respondents in the larger DMAs did not show significantly higher familiarity with the phrase than their smaller DMA counterparts.

Table -. Familiarity with Flex Alerts – by DMA Size

% Who are Very or Somewhat Familiar with Phrase	Phone	Web
Large DMAs	9%	15%
Small DMAs	13%	12%
Total	**11%**	**14%**
Statistics		
Chi-Square	*4.111*	*2.859*
df	*5*	*3*
Asymp. Sig.	*.534*	*.414*
Note: the differences between large and small DMAs were not statistically significant in either the phone or web surveys.		

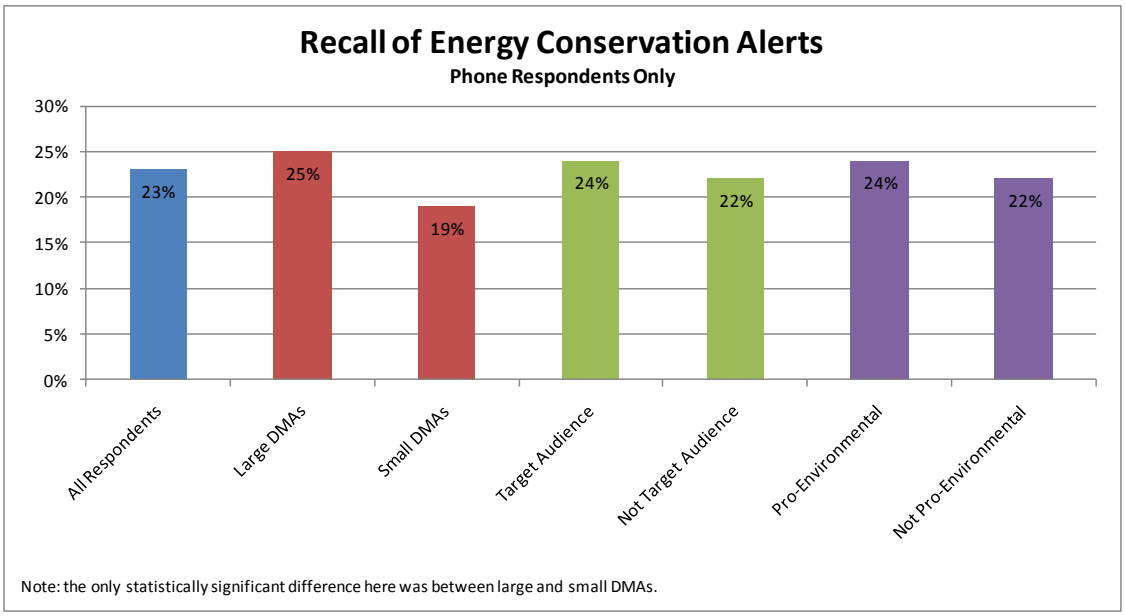
Recall of Energy Conservation Alerts

Roughly a quarter of all respondents (23% phone, 31% web[37]) recalled seeing an energy conservation alert[38] asking for immediate action that day. Figure - compares phone respondents' recall of energy conservation alerts by DMA size, target audience, and pro-environmental psychographics. Large DMA respondents were significantly more likely to recall hearing an alert (25%) than smaller DMA respondents (19%). As with the recall of FYPN ads, the target audience (college-educated female homeowners) did not report significantly higher levels of alert recall than the rest of the population. Strongly pro-environmental respondents were not significantly more likely than others to recall seeing an alert.

[37] The 90% confidence intervals range from 21% to 25% for phone respondents and 29% to 33% for web respondents.

[38] Note that this survey question did not specifically ask about recall of a "Flex Alert" but rather the more generic "energy conservation alert" because the term Flex Alert was not featured as prominently in the 2006 campaign as in the 2007 campaign (the phrase was used in the 2006 ads, but the ads were branded with the Flex Your Power NOW! logo).

Figure -. Recall of Energy Conservation Alerts



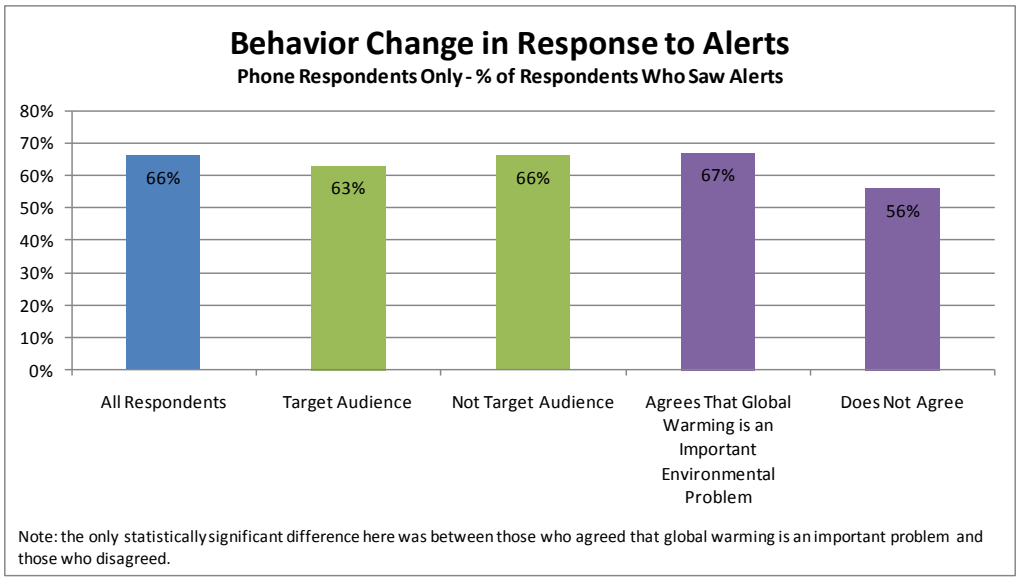
The majority of respondents who saw an alert (73% phone, 62% web) understood that the alert pertained to a particular time of day (as opposed to all day). Of those who said the alert asked them to conserve during a particular time of day, over two-thirds (71% phone, 68% web) correctly identified that time of day as afternoon. However, while it appears that most respondents are able to correctly identify that the conservation actions are needed during a *particular time* of day, the focus group results indicated that people do not understand that the alerts are asking for immediate action on *that day*, but rather interpret the messages as promoting a long-term lifestyle change.

Behavior Change in Response to Alerts

Of those respondents who recalled seeing an alert message, most took some kind of action to respond to the alert (66% of phone respondents, 84% web[39]). Note that these percentages include all respondents who indicated that they responded to at least one alert (i.e., including both "Yes" and "Sometimes" responses). There was no significant difference in the level of behavior change between the target audience and all others (Figure -). This indicates that the target audience as defined demographically may not be any more predisposed to taking action in response to alerts and perhaps further targeting is necessary. Respondents who agreed with the psychographic statement "Global warming is an important environmental problem" *did* report statistically significantly higher levels of action in response to an alert than those who disagreed (67% vs. 56%).

[39] The 90% confidence intervals range from 61% to 71% for phone respondents and 81% to 87% for web respondents.

Figure -. Behavior Change in Response to Alerts



Of *all* respondents (including those who did not recall seeing an alert message), 15% of all phone respondents and 19% of all web respondents saw at least one alert message and reduced their electricity consumption in response to the alert. The most common conservation action reported was avoiding using appliances (e.g., "don't do laundry"), followed by shutting off unneeded lights, setting the thermostat to 78 degrees or warmer, and shutting off the A/C altogether (Table -). Note that 15%-18% of respondents who took action in response to the energy conservation alert they saw specifically mentioned avoiding using appliances *during peak hours* (e.g., "do laundry in morning or evening").

Table -. Conservation Actions Taken in Response to Energy Conservation Alert

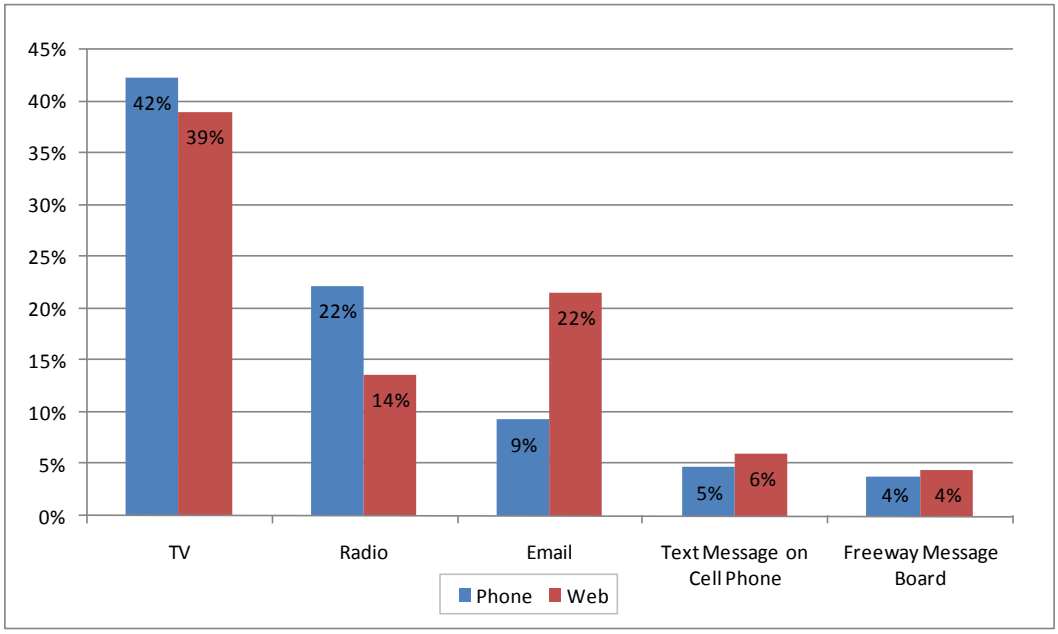
	% of All Respondents		% of Respondents Who Conserved	
	Phone	Web	Phone	Web
Avoid using appliances	3%	15%	55%	65%
Avoid using appliances *during peak hours*	1%	4%	15%	18%
Turn off unneeded lights	1%	8%	15%	32%
Set AC to 78 degrees or higher	1%	4%	11%	16%
Shut off AC	1%	3%	15%	15%
Use fans instead of AC	0%	1%	0%	5%
Conserve energy (general)	0%	1%	4%	4%
Conserve energy *during peak hours*	0%	0%	2%	2%
Use shades/curtains	0%	0%	0%	1%
Note: respondents could indicate that they took more than one conservation action.				

4.2.4 Potential Improvements to Program

Most Effective Channels to Communicate Alerts

Respondents were asked to identify the most effective channels to inform them that an immediate reduction in energy usage is needed that day. The most popular media channels for alert messages were television, radio, and email. Television was the top choice of both phone and web respondents; radio was the second most common preference of phone respondents (22%), whereas (unsurprisingly) web respondents were more likely to prefer an email directly to their inbox (22%). Very few respondents chose text messaging or highway message boards (see figure below).

Figure -. Preferred Means of Communicating Alerts



Of those respondents *who did not select email* as their preferred means of communications, 24% of phone respondents and 60% of web respondents indicated that they would be willing to share their email address for the purpose of energy conservation alerts. This indicates that a reasonably large share of respondents would be willing to receive email alerts, even if it is not their most preferred means. The program should continue efforts to collect email addresses for the purposes of issuing Flex Alerts.

Phone respondents in the target audience (as defined above) had slightly different preferences for media channels to communicate alerts, as compared to the rest of the population. While television is still the first choice of most (35% of target audience vs. 44% of the rest of the population), the target audience has stronger preferences for radio (28% vs. 21%), email (13% vs. 9%), and newspaper (9% vs. 6%) than the rest of the population. These differences *are* statistically significant for the phone survey respondents. The web survey responses to this question do not reveal significant differences between the target audience's preferred communication means and the rest of the population.

Over three-quarters of all respondents (79% phone, 82% web) report that they listen to the radio. Table - summarizes the percentages of respondents who listen to the radio *often* during the specified time period. Over one-quarter of respondents listen to the radio in the morning before leaving the house (an ideal time to adjust the thermostat or take other actions to reduce electricity usage in response to an alert).

Table -. Radio Usage by Time of Day

% Who Listen Often…	Phone	Web
In the morning before leaving the house	35%	26%
In the car	71%	76%
In the middle of the day	24%	29%

Similarly, Table - summarizes the percentages of respondents who watch TV often during the specified time periods. About one-third of respondents often watch TV in the morning before leaving the house.

Table -. Television Usage by Time of Day

% Who Watch Often…	Phone	Web
In the morning before leaving the house	34%	31%
In the middle of the day	18%	21%
In the evening	63%	66%

The target audience is significantly less likely to be watching television in the middle of the day than the rest of the population; in the phone survey, only 8% of target audience members watch TV in the middle of day, compared to 20% of all other respondents.

About three-quarters of respondents (73% phone, 75% web) reported that somebody in their household is at home during weekday afternoons.

These results indicate that while there may be someone home during weekday afternoons that *could* take action in response to a late-issued alert, relatively few people are watching TV during that time of day (and even fewer members of the target audience). The program will be more likely to reach potential responders via radio and television in the morning before they leave for work.

4.2.5 Respondent Characteristics

Attitudes Towards Environmental and Social Issues

The baseline survey asked a series of questions about respondents' attitudes and beliefs regarding recycling behavior, environmental issues, participation in environmental causes and community organizations, and other topics. Table - through Table - summarizes respondents' agreement or disagreement with a series of statements. Respondents who agreed or strongly agreed with each of the first four environmental statements were labeled "pro-environmental" for the comparisons made in previous sections.

Table -. Agreement with Environmental Statements

	I frequently recycle		I participate in environmental causes		Global warming is an important environmental issue		The choices I make regarding electricity usage can make a difference in greenhouse gas emissions		Comfort is more important to me than saving energy in my home*	
	Phone	Web	Phone	Web	Phone	Web	Phone	Web	Phone	Web
Strongly agree	57%	57%	14%	9%	43%	41%	35%	32%	7%	7%
Agree	33%	32%	39%	36%	37%	41%	44%	49%	28%	26%
Disagree	7%	8%	32%	30%	11%	10%	9%	13%	45%	51%
Strongly Disagree	2%	3%	11%	25%	7%	9%	4%	6%	15%	16%

*Note that the final column represents an *anti-environment* statement (unwillingness to sacrifice personal comfort) meaning that disagreement with that statement would indicate a more pro-environment opinion.

Columns do not total to 100% because "don't know" responses were not tabulated.

Table -. Agreement with Pro-Community Involvement Statements

	I participate in community meetings and organizations regularly		I should do my part to help fellow Californians	
	Phone	Web	Phone	Web
Strongly agree	10%	5%	33%	28%
Agree	20%	17%	58%	60%
Disagree	45%	40%	5%	8%
Strongly Disagree	21%	38%	1%	4%

Note: Columns do not total to 100% because "don't know" responses were not tabulated.

The target audience is significantly more likely to agree with all four pro-environmental psychographic statements (recycling, participation in environmental causes, importance of global warming, energy usage makes a difference in emissions) than the rest of the population. In the phone survey, over half (51%) of the target audience agreed with all four pro-environmental statements, whereas 39% of all other respondents agreed.

Home Characteristics

The majority of respondents were homeowners: 71% of phone respondents owned their own home, as did 53% of web respondents. In the actual California population, 58% of Californians are homeowners. The telephone survey reached far more respondents who live in single family homes (as opposed to duplexes, apartment buildings, or mobile homes) than did the web survey, which closely matched the proportion of Californians that live in single family homes.

According to the survey data, homeowners were no more or less likely to change their behavior in response to an alert than were renters. 65% of homeowners and 70% of renters in the phone survey reported taking action in response to an alert; in the web survey, 85% of homeowners and 83% of renters said the same (neither difference was statistically significant). This result implies that targeting homeowners is not necessarily an effective way to reach those people most likely to respond to an alert.

Respondents were also asked about their appliance usage during the afternoons on summer work days (Table -). Approximately one-quarter of all respondents have central air conditioners that are running during the afternoons on summer workdays, and approximately one-third of all respondents do at least two loads of laundry per week, indicating that a sizable percentage of the population could potentially reduce their electricity demand during summer workday afternoons by avoiding the use of these and other appliances.

Table -. Appliance Usage During Summer Workday Afternoons

Equipment	% of All Phone Respondents	% of All Web Respondents	% of Phone Respondents Who Have That Equipment	% of Web Respondents Who Have That Equipment
Central air conditioner	22%	26%	43%	48%
Pool pump	3%	3%	47%	42%
Home computer	30%	61%	41%	66%
Washing machine (at least 2 loads per week)	31%	36%	35%	46%
Dishwasher (at least 2 runs per week)	16%	21%	23%	31%

4.2.6 Conclusions from Baseline Survey Results

The following list presents the key findings of the baseline survey effort. Note that the ranges of percentages presented below represent the range between the web survey results and the phone survey results (specific differences are presented in the preceding sections).

- About 13-18% of respondents recalled seeing a Flex Your Power NOW! advertisement, and 23%-31% recalled seeing an energy conservation alert message. But when compared to baseline survey results of other similar media campaigns,[40] the awareness levels seem reasonable, and may reflect that segment of society that is "aware" of energy issues.

- Verbatim responses to questions about the content of Flex Your Power, Flex Your Power NOW!, and Flex Alert messages indicated that respondents recalling Flex Your Power advertisements, are often actually thinking of the peak conservation message of the Flex Your Power NOW!

[40] For reference, in the NYSERDA Keep Cool Program (a high-intensity marketing campaign that promoted load-shifting of A/C usage and the sale of Energy Star labeled air conditioning units), a baseline survey found pre-summer awareness of the program to be 25%, which then increased by 20% to 45% awareness in September after the campaign's completion. See Engel et al, "Quantifying Load-Shifting Benefits from a Marketing Campaign," *2003 Energy Program Evaluation Conference*, Seattle, WA.

advertisements. Thus, actual recall of FYPN *messages* may be higher than respondents indicate, even if they are not recognizing the *phrase*. These results should be viewed through the lens of the focus group findings, which indicated that even those who understand the desired actions and timing of peak do not understand that Flex Your Power NOW! is an action requested on a particular *day*.

- In most cases, respondents in the four largest DMAs (in which most media purchases were focused) did *not* show significantly higher recall of FYP ads, FYPN ads, or energy conservation alerts than did the respondents in the smaller DMAs.[41]

- Of respondents who actually saw Flex Your Power NOW! advertisements, the majority (56%-68%) reported taking some kind of action in response; similarly, 66%-84% of respondents who saw Flex Alerts reported responding to the alert. Members of the target audience do seem to be more likely to change their behaviors to respond to alerts (63%-85% as opposed to 53%-67%); however, the sample sizes were not large enough to determine if this difference is statistically significant.

- Phone respondents who agreed with the statement that "Global warming is an important environmental issue" were statistically significantly more likely to respond to an alert than those who disagreed. However, as discussed in Sections and , this effect was not consistently observed in the other survey efforts.

4.3 Post-Event Survey

Immediately after the Flex Alert was announced in late August 2007, the Summit Blue team implemented a 600-point post-event survey via telephone (conducted by Northwest Research Group) to measure respondents' awareness and recall of the alert messages as well as any actions taken in response to the alerts. The survey effort was fielded between August 30th and September 9th and resulted in 613 completes.[42]

The post-event survey instrument was modified from a survey instrument used by Glacier Consulting Group in a post-event survey in late summer 2006. Where appropriate, comparisons to Glacier's post-event survey results are made in footnotes.[43]

4.3.1 Unaided Recall of Energy-Related Behaviors

Over one-quarter (26%) of respondents indicated that they did *something* to change (not necessarily reduce) how they normally use electricity in the past four days. 27% of these respondents stated that they adjusted their thermostat higher or avoided using A/C; about one-fifth each said they shut off unneeded

[41] The only exceptions to this statement were the phone respondents' recall of Flex Your Power ads and energy conservation alerts, which were 5-6% higher among large DMA respondents than smaller DMA respondents.

[42] The Flex Alert occurred in the days immediately preceding Labor Day weekend; in order to reach the desired number of completes during this holiday weekend, the timeframe of the survey was extended. There was no significant observed decline in alert recall levels or conservation activity based on survey completion date.

[43] Glacier Consulting Group. *Flex Your Power Now Post-Event Survey, Round 1: July Heat Storm Report.* September 14, 2006. All references to previous Glacier post-event survey results were obtained from this presentation.

lights, used appliances after 7 PM, or didn't use appliances.[44] Table - summarizes the actions taken by respondents.

Table -. Actions Taken to Change Electricity Consumption

	Actions of Those Respondents Who Said They Did Something	% of All Respondents
Set thermostat to 78 degrees or higher; or avoided using A/C	27%	7%
Turn off unneeded lights	24%	6%
Use appliances after 7 PM	22%	6%
Don't use appliances	19%	5%
Left home; spent more time outdoors	4%	1%
Shut off pool pump	2%	1%
Went to a public area that provides AC	1%	0%
Other*	20%	5%
Used fans more	6%	2%
Used A/C *more*	13%	3%
Note: respondents could provide more than one response. * Other responses included shutting drapes or blinds, keeping windows shut during the day, pouring water over the roof tiles, cooking less, etc.		

The survey question was specifically phrased to reduce social desirability bias by avoiding prompting the respondent to come up with an energy *conservation* behavior. Since some respondents reported using their air conditioners *more* (not a conservation action), Summit Blue coded those as "no conservation action taken" and determined that 22% of all respondents took some kind of energy-conserving action in the past four days.[45] Table - summarizes the percentages of respondents who took energy-conserving actions by designated market area (DMA) as well as by DMA size (large or small). Far more respondents in large DMAs (30%) than smaller DMAs (14%) reported taking energy-conserving actions; the difference was statistically significant. The two largest Southern California DMAs (Los Angeles and San Diego) saw greater conservation actions than the largest Northern California DMAs (San Francisco and Sacramento). As discussed in Section , the San Diego region was exposed not only to the Flex Alert messages but also to additional strongly worded conservation messages from SDG&E warning of possible blackouts; as such, it is unsurprising that more San Diego residents reported taking conservation actions than residents of any other DMA.

[44] Note that the question was an open-ended question, not multiple choice, to avoid prompting the respondent.

[45] Glacier's 2006 post-event survey found that 49% of respondents reported doing something out of the ordinary to reduce electric use during the heat wave. The disparity between last year's result and this year's result is likely caused by Summit Blue's revisions to the survey question phrasing as discussed above.

Table -. Respondents Who Reported Reducing Electricity Consumption – by DMA and DMA Size

	% of Respondents
Large DMAs	**30%**
San Diego	39%
Los Angeles	32%
Sacramento	25%
San Francisco	21%
Smaller DMAs	**14%**
Monterey	26%
Eureka	23%
Fresno-Bakersfield	19%
Yuma-Palm Springs	10%
Chico	10%
Santa Barbara	7%
Total	**22%**
Statistics (Large vs. Small Comparison) Chi-Square, df, Asymp. Sig.[46]	*21.003, 1, .000*
Statistics (All DMAs Compared) Chi-Square, df, Asymp. Sig.	*35.947, 9, .000*
Note: both comparisons are statistically significant at the 90% level.	

4.3.2 Unaided Recall of Energy Conservation Messages

Over half (55%) of respondents recalled seeing advertisements, announcements, emails, or other public notices about conserving energy in the past four days.[47] Respondents in the four largest DMAs were more likely to recall seeing an advertisement or other energy conservation message than their small DMA counterparts (Table -). Sixty percent of respondents in the four largest DMAs recalled seeing an energy conservation message, compared to 49% of small DMA respondents. This difference is driven primarily by the extremely high percentage of San Diego respondents who saw an energy conservation message (82%); as discussed above, San Diego residents were exposed to additional conservation messages from SDG&E in the days immediately after the Flex Alert period.

[46] A note on statistics used: any time the "asymp. sig." statistic is *under* 0.10, the comparison is statistically significant at the 90% level. In some cases the statistics are presented in footnotes as: (chi-square, df, Asymp. Sig.).

[47] Glacier's post-event survey conducted in 2006 found that 68% of respondents heard/saw "something" about conserving energy.

Table -. Respondents Who Saw an Energy Conservation Message – by DMA and DMA Size

	% of Respondents
Large DMAs	**60%**
San Diego	82%
Los Angeles	56%
Sacramento	55%
San Francisco	48%
Smaller DMAs	**49%**
Monterey	59%
Eureka	54%
Chico	54%
Santa Barbara	51%
Fresno-Bakersfield	48%
Yuma-Palm Springs	37%
Total	**55%**
Statistics (Large vs. Small Comparison) Chi-Square, df, Asymp. Sig.	*8.453, 1, .004*
Statistics (All DMAs Compared) Chi-Square, df, Asymp. Sig.	*35.582, 9, .000*
Note: both comparisons are statistically significant at the 90% level.	

Respondents who reported seeing an energy conservation message were statistically significantly more likely to have taken action to reduce their electricity consumption. Nearly one-third (31%) of respondents who saw an energy conservation message reported taking an energy conserving action (as described in the previous section) while only 13% of respondents who did *not* see a message reported doing so.[48] The 13% of respondents who reported conserving electricity even though they did not see an energy conservation alert may represent that share of the population for whom conservation is already an engrained habit. Note that the survey instrument does not explicitly ask respondents if they were influenced by the message to take conservation actions; rather, the survey instrument asks about changes in energy consumption *prior* to mentioning energy conservation, to reduce potential bias. The results do not "prove" that the messages *caused* respondents to take action, but rather demonstrate a correlation between taking energy conservation actions and recalling an energy conservation message.

As shown in Table -, most respondents reported seeing/hearing these messages on television news/interviews (42%), television commercials (38%), or radio commercials (14%). The very high percentage of respondents who saw an energy conservation message on TV news (as opposed to

[48] This level of response is much lower that what was found in the Glacier 2006 post-event survey, in which 53% of respondents who saw something and 40% of respondents who did not see an energy conservation message reported taking an action to reduce electric use.

commercials) reflects the broad media coverage that the heat wave and corresponding need for energy conservation received; this indicates that the Flex Alert campaign's paid advertising was not the only vehicle for getting the energy conservation message out.

Table -. Source of Energy Conservation Message

	% of Respondents Who Recalled Ad
Television – commercial	38%
Television – news or interviews	42%
Radio – commercial	14%
Radio – news or interviews	10%
Newspaper	12%
Emails	2%
Billboard	1%
Electric utility representative	1%
Flex Your Power website	0.3%
Utility website (SCE, SD&GE, PG&E)	0.3%
Other website	2%
Magazine or business journal	0.3%
Other	6%
Don't know	3%
Note: respondents could provide more than one response.	

The most common requested action that respondents recalled from the energy conservation messages was "use appliances after 7 PM" (34%), followed by "set thermostat to 78 degrees or higher" (33%) (Table -). The relatively high percentage of respondents who could recall at least one of the key FYPN-recommended actions (use appliances after 7 PM, set thermostat to 78 degrees or higher, turn off unneeded lights) is a positive finding, indicating that the requested actions are being conveyed well even if respondents don't specifically recall seeing a Flex Alert (see Section). Note that many of the TV news stories that covered the Flex Alert/need for conservation listed the same three key FYPN actions.

Table -. Recall of Requested Actions – Energy Conservation Messages

	% of Respondents Who Recalled Ad
Use appliances after 7 PM	34%
Set thermostat to 78 degrees or higher	33%
Turn off unneeded lights	15%
Don't use appliances	7%
Conserve, conserve energy	24%
Other*	14%
Don't know	8%
Note: respondents could provide more than one response. * Common "other" responses included switch lightbulbs to CFLs, use fans more, and close blinds/drapes (each said by less than 1% of respondents).	

Respondents were asked whether the message asked them to conserve long-term, seasonally, or on a particular day, and also if the message asked them to conserve during a particular time of day. Nearly half of respondents (48%) stated that the message asked for conservation during a particular time of day; however, more respondents thought the message was asking for long-term (20%) or seasonal (21%) conservation than thought the message was referring to a particular day (20%). Seventeen percent of respondents could not offer a guess on the time period during which the message asked them to conserve. These results correspond with the focus group finding that while respondents generally understood the concept of conserving during peak times of day, they did not understand that the FYPN ads they watched were asking for conservation on *that particular day*, but rather thought they were requests for long-term behavior changes. Significantly more large DMA respondents (26%) than small DMA respondents (5%) stated that the message asked for conservation on a particular day, indicating that the heavier media weight given to the large DMAs may have had an effect on the understanding of the alert time period.

Respondents were then asked if the message mentioned a specific alert program and were read a list of choices for the program/alert name. Thirty percent of respondents said there was no specific program name associated with the message and 30% of respondents identified the alert as a Flex Alert; other common responses were Conservation Alert (29%), Emergency Alert (27%), and Flex Your Power Now (27%). It is unsurprising that respondents thought they recognized multiple phrases given the variety of phrases used to describe the alert by the different utilities and news media outlets (as discussed in Sections and).

Table -. Recall of Alert Name – Energy Conservation Messages

	% of Respondents Who Recalled Ad
No specific program was mentioned	30%
Flex Alert	30%
Conservation Alert*	29%
Emergency Alert	27%
Flex Your Power Now	27%
Power Watch Day**	26%
Flex Your Power	25%
Crisis Alert	24%
Other	9%
Note: respondents could provide more than one response. *Both the PG&E and SCE websites used the phrase "Conservation Alert" during the Flex Alert period. ** Several media outlets used the phrase "Power Watch".	

Respondents in large DMAs were significantly more likely to associate the phrase "Flex Alert" with the message that they saw than those in smaller DMAs; 39% of large DMA respondents selected "Flex Alert" as opposed to 28% of small DMA respondents.[49]

4.3.3 Aided Recall of Flex Alerts

The survey described the Flex Alert TV ad and asked respondents if they recalled seeing it. Approximately 9% of respondents specifically recalled the Flex Alert TV ad.[50] As with the unaided recall, large DMA respondents were statistically significantly more likely to recall the ads (12%) than their small DMA counterparts (5%); however, recall levels are low for both groups. It is important to note that the ad specifically described the paid TV alert message and thus the 9% does not capture those respondents who may have heard a radio spot, received an email alert, or heard a mention of the Flex Alert on the news. Given the much higher percentage of respondents (55%) who indicated that they heard *something* regarding energy conservation (unaided recall), and the fact that many of those respondents did specifically recall the actions promoted by the Flex Your Power NOW! campaign (waiting until after 7 PM to use appliances, setting thermostat to 78 degrees or higher, and shutting off unneeded lights), it is likely that the Flex Alert message is reaching more people than the 9% recall of the TV ad would indicate.

Table - summarizes respondents' recollections of what the Flex Alert TV ad requested that they do. The most common response was "use appliances after 7 PM" (24%), followed by "set thermostat to 78 degrees or higher" (14%). However, 44% of respondents who recalled seeing the Flex Alert TV ad could not recall a single action that the ad asked them to take.

[49] The difference was statistically significant (3.651, 1, .056).

[50] In Glacier's 2006 post-event survey, 18% of respondents recalled seeing a Flex Alert; however, Summit Blue's question was more narrowly focused on respondents' specific recall of the Flex Alert TV advertisement.

Table -. Recall of Requested Actions – Flex Alerts

	% of Respondents Who Recalled Flex Alert
Use appliances after 7 PM	24%
Set thermostat to 78 degrees or higher	14%
Turn off unneeded lights	12%
Other	10%
Don't use appliances	2%
General "conserve", "conserve energy"	12%
Don't know/Refused	44%
Note: respondents could provide more than one response.	

Similar to the unaided energy conservation alert questions (Section), respondents were asked about the timeframe of the Flex Alert's request for energy conservation. Just 4% understood that the request was for a particular day, but 46% understood that the request was for a particular *time* of day. Nearly a third (30%) of respondents who recalled seeing a Flex Alert TV ad could not recall the timeframe for the requested conservation. This combined with the relatively high recall of the Flex Alert/Flex Your Power Now!/Flex Your Power phrases (as shown in Table -) suggests that respondents may be confusing the Flex Alert message with the more general conservation/efficiency messages of the Flex Your Power campaign.

Table -. Flex Alert Requested Timeframe

	% of Respondents Who Recalled Flex Alert
Over the long-term	12%
Seasonally	22%
On a particular day	4%
At a particular time of day	46%
Other	6%
Don't know/Refused	30%
Note: respondents could provide more than one response.	

74% of those who recalled the advertisement indicated that they took some kind of action in response to the alert; this translates to 7% of *all* respondents.[51] Given that 31% of respondents who recalled seeing an energy conservation message (not specifically a Flex Alert) reported taking action, the findings either indicate that the Flex Alert was significantly more effective at eliciting responses than other conservation messages *or* that by this point in the survey, respondents have been conditioned to believe that the "right" and socially desirable answer is "yes, I took action in response to the Flex Alert." While Summit Blue

[51] Glacier's 2006 post-event survey found that 73% of respondents who saw a Flex Alert reported taking action; however, twice as many 2006 respondents (18%) recalled seeing a Flex Alert, so the 73% translated into 14% of all respondents.

made every attempt to reduce social desirability bias in the survey instrument, it is impossible to avoid entirely when dealing with human interviewers, and thus the 74% of respondents who reported taking conservation action in response to the Flex Alert should be viewed as an upper bound.

Table - summarizes the actions taken. The most common conservation action reported was using appliances after 7 PM (32% of respondents who saw a Flex Alert), followed by setting the thermostat to 78 degrees or higher (30%).

Table -. Actions Taken in Response to Flex Alert

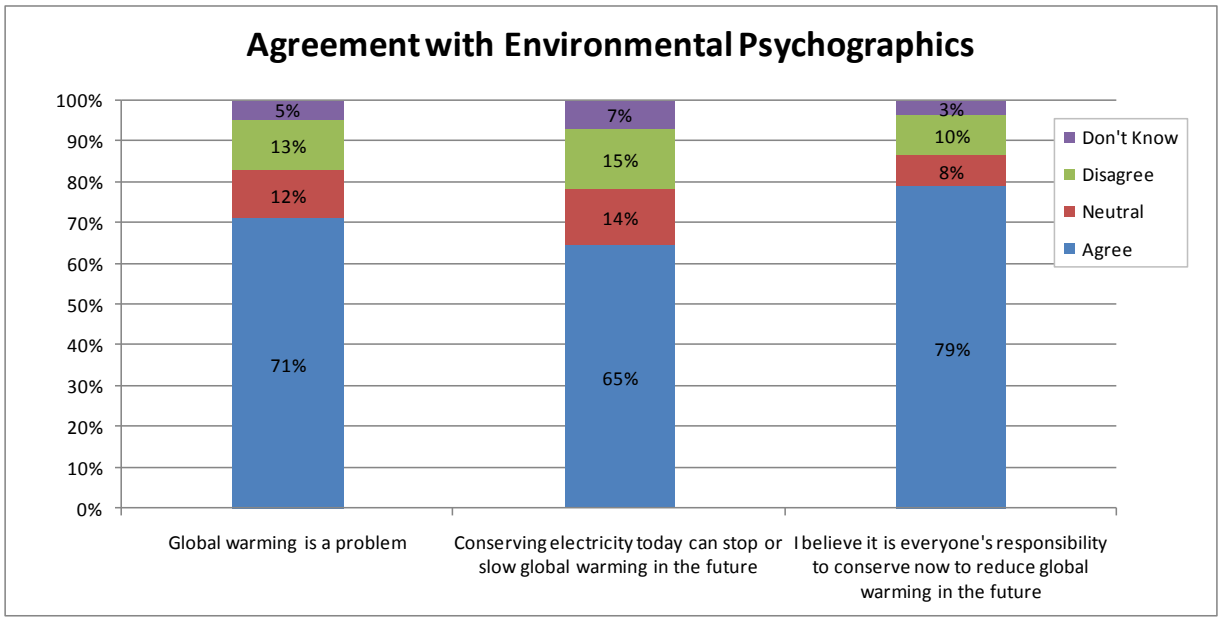
	% of Respondents Who Recalled Flex Alert	% of All Respondents
Took action in response to Flex Alert	**74%**	**7%**
Use appliances after 7 PM	32%	3%
Set thermostat to 78 degrees or higher	30%	2%
Turn off unneeded lights	18%	1%
Don't use appliances	16%	1%
Other	16%	1%
Did not take any actions in response to the Flex Alert	**22%**	**2%**
Don't know/Refused	4%	0%

When asked why they did not take action in response to the Flex Alert, several respondents indicated that they already do everything they can to conserve. One stated, "It wasn't an alert, just a commercial." One simply said, "Why should I?" These statements relate directly to some of the major barriers to taking action in response to an energy conservation alert: the sense that people already conserve as much as they can; lack of information on additional ways to save energy; confusion about when the alerts are actually happening; and perceived lack of direct benefit to the conserver.

4.3.4 Psychographics

Respondents were asked to rate their agreement or disagreement with a series of psychographic statements related to global warming. As shown in Figure -, 71% of respondents agree that global warming is a problem, and 79% believe it is everyone's responsibility to conserve now to reduce global warming in the future. Respondents are slightly less sure that conserving electricity today can stop or slow global warming in the future (65% agreed).

Figure -. Respondent Psychographics: Opinions on Global Warming



Respondents who agreed with these statements were *not* statistically significantly more likely to have taken energy conservation actions than those who were neutral or disagreed (Table -). This finding calls into question the choice to use the "prevent blackouts today and global warming tomorrow" tagline in the Flex Alert ads.

Table -. Respondents Who Took Energy Conserving Actions – by Agreement with Psychographic Statements

	Global warming is a problem	Conserving electricity today can stop or slow global warming in the future	I believe it is everyone's responsibility to conserve now to reduce global warming in the future
Agree	27%	28%	28%
Neutral	19%	23%	19%
Disagree	28%	22%	20%

4.3.5 Conclusions from Post-Event Survey Results

Key findings from the post-event survey include:

- 22% of respondents took action to reduce their electricity consumption during the four-day period before taking the survey; the most common actions taken were adjusting the thermostat upwards or turning off A/C entirely.

- More respondents in larger DMAs (where Flex Alert messaging is concentrated) took energy conserving actions than their smaller DMA counterparts (30% vs. 14%).

- 55% of respondents recalled seeing an advertisement, public notice, or other message regarding energy conservation in the previous four days.

- Most respondents reported seeing/hearing these messages on television news/interviews (42%), television commercials (38%), or radio commercials (14%).

- 31% of respondents who saw an energy conservation message took some kind of energy-conserving action; only 13% of those who did *not* see an energy conservation message took action.

- Respondents' recollections of what actions the energy conservation messages asked them to take generally corresponded with the actions promoted by the Flex Alert campaign: use appliances after 7 PM (recalled by 34%), set thermostat to 78 degrees or higher (33%), and turn off unneeded lights (15%).

- 48% of respondents understood that the conservation was needed during a particular *time of day*; but just 20% thought it was needed on a *particular day*.

- When the ad was described to them, 9% of respondents specifically recalled seeing the Flex Alert TV ad.

- Of those respondents who recalled the Flex Alert TV ad, 74% reported taking action in response to the alert, meaning 7% of *all* respondents both saw the Flex Alert and took energy conserving actions in response.

- Respondents who agreed that global warming was a problem were *not* significantly more likely to conserve than those who disagreed.

4.4 Post-Summer Survey

This section discusses the results of the Flex Your Power NOW! post-summer survey conducted by Opinion Northwest Research (formerly Northwest Research Group) as part of Summit Blue's evaluation of the 2006-2007 Flex Your Power NOW! (FYPN) program. The survey was conducted by telephone between December 22, 2007 and January 19, 2008. The survey obtained 1217 completes. The survey fielded for this effort was a modification of the baseline survey conducted in spring 2007, with the focus on assessing respondents' familiarity with and recall of Flex Alert, their understanding of what types of conservation actions are requested and *when* those actions should take place, and their responses to the Flex Alerts seen.

Note that while some comparisons with the baseline survey results are made in this section, a more comprehensive summary of the overarching results of the three survey efforts (baseline, post-event, and post-summer), including discussion of whether changes in familiarity, recall, and behavior over time are statistically significant, is presented in Section .

4.4.1 Familiarity with Flex Your Power, Flex Your Power NOW! and Other Energy Conservation Programs

Unaided, 51% of respondents indicated that they were aware of energy conservation programs/campaigns in California. Some of these respondents were able to name multiple programs (unprompted), including Flex Your Power (1% of respondents) and the 20/10 or 20/20 program (1%); others could not recall the specific program name but described campaigns that provided rebates (8%) or promoted efficient lighting or CFLs (16%), efficient appliances including Energy Star appliances (16%), renewable energy such as solar or wind power (6%), and other related campaigns.

Half of all respondents stated that they were very or somewhat familiar with the phrase "Energy Star"; members of the FYPN target audience (defined as college-educated female homeowners) had significantly higher familiarity with the phrase (67%) than all other respondents (46%).[52]

Flex Your Power

Respondents were reasonably familiar with the phrase "Flex Your Power." 42% of respondents rated their familiarity with the phrase as "very familiar" or "somewhat familiar." This is a slight increase in familiarity from the baseline survey result of 40% who were very or somewhat familiar. The target audience is significantly more familiar with the phrase (55%) than all other respondents (39%).[53]

Just 3% of respondents reported that they had ever visited the Flex Your Power website.[54]

41% of respondents recalled seeing a Flex Your Power advertisement.[55] Respondents in the larger designated market areas (DMAs)—where the majority of FYP messaging is focused—did show a higher level of recall than in the smaller DMAs; however, the difference was not statistically significant (Table -).

Table -. Recall of Flex Your Power Advertisements – by DMA Size

	% Who Recall FYP Ad
Large DMAs	43%
Small DMAs	37%
Total Confidence Interval @ 90%	**41%** 39% - 43%
Statistics *Chi-Square* *df* *Asymp. Sig.*	 *5.788* *3* *.122*

Note: the difference between large and small DMAs is *not* statistically significant.

Respondents were asked what they learned from the Flex Your Power ad that they saw. Over half (52%) of those who saw an FYP ad mentioned energy conservation in general (e.g., "ways to save energy"). Just 9% said "buy or install energy-efficient equipment." As in the baseline survey, it appears that some respondents who claim to recall Flex Your Power advertisements may be actually thinking of Flex Your Power NOW! or Flex Alerts. Review of the verbatim results indicated that 5% of respondents mentioned some variation on "conserve energy during peak hours" or "do your laundry after 7 PM." One respondent specifically mentioned FYPN, stating that he or she learned that "it's important to cut down on energy usage during peak hours when a Flex Your Power Now alert [is issued]." Other examples of respondents who indicated that they were thinking of FYPN behaviors when asked what they know about Flex Your Power include:

[52] The difference is statistically significant (54.121, 4, .000).

[53] The difference is statistically significant (29.535, 4, .000).

[54] Compare to 2% of phone respondents in the baseline survey.

[55] Compare to 38% of phone respondents in the baseline survey.

- *It is a statewide program that asks people to reduce energy consumption during peak hours and encourages people to use their appliances during the evening.*

- *When the days are hot, turning down the air conditioner and conserving power.*

- *I think it has to do with monitoring your energy use when there's a high demand for energy in the summer.*

Respondents were then asked what actions they took in response to the Flex Your Power ads. Overall, 67% of respondents who saw a Flex Your Power ad indicated that they did something to conserve in response to the ad. The most common response was "shut off electric consuming equipment", mentioned by 35% of respondents who saw a FYP ad. Over one-quarter (28%) of respondents said that they bought or installed energy-efficient equipment. Again, some respondents seem to confuse the FYP ads with the FYPN message of energy conservation during peak hours; 4% of respondents conserved during peak hours in response to the FYP ad. Table - summarizes both the lessons learned from FYP ads and the actions taken in response to the ads.

Table -. Lessons Learned and Actions Taken in Response to Flex Your Power Ads

% of Respondents Who Saw FYP Ad	% Who Learned About this Action from FYP Ad	% Who Took This Action in Response to FYP Ad
Conserve energy	52%	N/A
Conserve energy *during peak hours*	5%	4%
Buy or install energy-efficient equipment	9%	28%
Shut off electric consuming equipment	12%	35%
Change thermostat settings	7%	16%
Get an energy audit	1%	2%
Other	7%	8%
Note: respondents could provide multiple responses.		

Flex Your Power NOW!

Just 14% of respondents rated their familiarity with the phrase "Flex Your Power NOW!" as very or somewhat familiar.[56] Respondents in larger DMAs did not show higher familiarity with the phrase than those in smaller DMAs. Note that the phrase was not *officially* used in the 2007 campaign, but some media outlets and utility websites did mention it.

[56] Compare to 15% of phone respondents in the baseline survey.

Table -. Familiarity with Flex Your Power NOW! Phrase – by DMA Size

	% Who are Very or Somewhat Familiar with Phrase
Large DMAs	13%
Small DMAs	14%
Total	**14%**
Statistics	
Chi-Square	*4.920*
df	*5*
Asymp. Sig.	*.426*
Note: the difference between large and small DMAs is *not* statistically significant.	

4.4.2 Flex Alerts

Familiarity with Flex Alerts

Few respondents had any familiarity with the phrase "Flex Alert." Overall, 25% of respondents had some familiarity with the phrase.[57] Table - presents familiarity levels with the phrase by DMA size. Large DMA respondents had slightly higher levels of familiarity (27%) with the phrase than their small DMA counterparts (22%). Just 4% of all respondents ranked themselves as *very* familiar with the phrase Flex Alert.[58]

Table -. Familiarity with Flex Alerts – by DMA Size

	Large DMAs	Small DMAs	All Respondents
% Very Familiar	4%	3%	4%
% Somewhat Familiar	8%	10%	9%
% Slightly Familiar	13%	7%	10%
% Not at All Familiar	73%	78%	75%
Statistics			
Chi-Square			*11.154*
df			*4*
Asymp. Sig.			*.025*
Note: the differences between large and small DMAs are statistically significant.			

[57] Compare to 19% of phone respondents in baseline survey.

[58] Compare to 3% of phone respondents in the baseline survey.

Recall of Flex Alerts and Energy Conservation Alerts

Fifteen percent of respondents specifically recalled seeing a Flex Alert message; another 20% of respondents recalled seeing an energy conservation alert asking for conservation that day (but did not specifically associate the "Flex Alert" term with what they saw). All together, 34% of respondents recalled some type of energy conservation alert.[59] Large DMA respondents reported slightly higher levels of recall than did their small DMA counterparts, but the differences were not statistically significant.

Table -. Recall of Flex Alerts and Energy Conservation Alerts – by DMA Size

	% Who Recall Flex Alerts	% Who Recall Other Energy Conservation Alerts	% Who Recall Some Type of Alert
Large DMAs	15%	21%	36%
Small DMAs	14%	18%	32%
Total Confidence Interval @ 90%	**15%** 14% - 16%	**20%** 18% - 22%	**34%** 31% - 37%
Statistics *Chi-Square* *df* *Asymp. Sig.*	 *2.020* *2* *.364*	 *1.746* *2* *.418*	 *1.748* *1* *.186*
Note: the differences between large and small DMAs are *not* statistically significant.			

The target audience (college-educated female homeowners) reported significantly higher levels of "Flex Alert" recall (23%) than the rest of the population (13%); however, the target audience was *not* significantly more likely to recall a generic energy conservation alert (Table -).

Table -. Recall of Energy Conservation Alerts – by Target Audience

	% Who Recall Flex Alert	% Who Recall Other Energy Conservation Alert	% Who Recall Some Type of Alert
Target Audience (college-educated female homeowners)	23%	20%	43%
All Others	13%	20%	32%
Total Confidence Interval @ 90%	**15%** 14% - 16%	**20%** 18% - 22%	**34%** 31% - 37%
Statistics *Chi-Square* *df* *Asymp. Sig.*	 *17.495* *2* *.000*	 *1.157* *2* *.561*	 *8.851* *1* *.003*
Note: the differences between the target audience and all others are statistically significant for the recall of Flex Alerts and for both alerts combined, but not for the recall of generic energy conservation alerts.			

[59] Compare to 23% of phone respondents in the baseline survey.

Respondents were asked what they learned from the Flex Alert ad that they saw. The majority of respondents who saw a Flex Alert or energy conservation alert mentioned generic energy conservation (52%); 22% specifically mentioned conservation during the afternoon or peak hours.

Table -. Recall of Flex Alert Message Content

Message	% of Respondents Who Saw Alert
Conserve energy	52%
Conserve energy during afternoon	22%
Shut off unnecessary lights	20%
Shut off electric consuming equipment	13%
Change thermostat settings	11%
Buy or install energy-efficient equipment	7%
Avoid a brownout	6%
Note: respondents could provide multiple responses.	

The majority of respondents saw or heard about the Flex Alert on television (75%), followed by radio (33%), and newspaper (18%). Fewer respondents heard about the alert through more high-tech means; 8% saw the alert on a website and 4% received an email regarding the alert.

Respondents were asked what suggestions for energy conservation actions they recall hearing in the Flex Alert ad (Table -). The most common response was "turn thermostat down," recalled by 43% of respondents who saw an alert, followed by "use major appliances in early morning or night" (29%) and "shut off unnecessary appliances or electric equipment" (29%).

Table -. Recall of Flex Alert's Suggestions for Energy Conservation Actions

Message	% of Respondents Who Saw Alert
Turn thermostat down	43%
Use major appliances in early morning or night	29%
Shut off unnecessary appliances or electric equipment	29%
Turn off unneeded lights	25%
Conserve energy	21%
Conserve energy in the afternoon	15%
Use fans to cool house	9%
Pull window shades or curtains	8%
Note: respondents could provide multiple responses.	

The majority of respondents who saw an alert (61%) understood that the alert pertained to a particular time of day (as opposed to all day). Of those who said the alert asked them to conserve during a particular time of day, 61% correctly identified that time of day as afternoon. While a majority of respondents correctly stated that the alert pertained to a particular time of day, the percentage of respondents making

that statement actually decreased from the baseline survey result of 73% of phone respondents. This could possibly indicate that the new 2007 ads did not emphasize the time of day aspect of the alert as effectively as the 2006 ads did; alternatively, the television news media may not have placed enough emphasis on the time of day aspect. . Additionally, many respondents still do not seem to understand that that alert is asking for immediate action *that day*; when asked *when* they took conservation actions in response to the alert, 39% of respondents who conserved said that they did so *every day* and 95% said that they have continued taking action to conserve electricity since seeing the alerts. These results clearly indicated that respondents are interpreting the alerts as requests for long-term lifestyle changes, not short-term, emergency behaviors.

Behavior Change in Response to Alerts

Of those respondents who recalled seeing an alert message, nearly two-thirds took some kind of action to respond to the alert (64% of respondents).[60] Of *all* respondents (including those who did not recall seeing an alert message), 22% saw at least one alert message and reduced their electricity consumption in response to the alert.[61] Note that these percentages include all respondents who indicated that they responded to at least one alert (i.e., including both "Yes" and "Sometimes" responses). While a slightly larger share of large DMA residents (66% of those who saw alerts) took conservation actions compared to their smaller DMA counterparts (60%), the difference was not statistically significant (Table -).

[60] Compare to 66% of phone respondents in baseline survey.

[61] Compare to 15% of phone respondents in baseline survey.

Table -. Behavior Change in Response to Alerts – by DMA and DMA Size

	% of Respondents Who Saw Alert
Large DMAs	**66%**
Los Angeles	73%
Sacramento	73%
San Francisco	60%
San Diego	58%
Smaller DMAs	**60%**
Fresno	81%
Chico	65%
Monterey	61%
Palm Springs	61%
Santa Barbara	48%
Bakersfield	48%
Eureka	47%
Total Confidence Interval @ 90%	**64%** 60% - 68%
Statistics (Large vs. Small Comparison) *Chi-Square, df, Asymp. Sig.*	 *1.763, 1, .184*
Statistics (All DMAs Compared) *Chi-Square, df, Asymp. Sig.*	 *17.174, 10, .071*
Note: the comparison between individual DMAs *is* statistically significant, but the comparison by DMA size is *not* significant.	

The target audience (previously defined) actually showed a lower response (60% of those who saw alerts) than all other respondents (65%), but again the difference was not statistically significant (Table -). This indicates that the target audience as defined demographically may not be any more predisposed to taking action in response to alerts and perhaps further targeting is necessary.

Table -. Behavior Change in Response to Alerts – by Target Audience

	% of Respondents Who Saw Alert
Target Audience (college-educated female homeowners)	60%
All Others	65%
Total Confidence Interval @ 90%	**64%** 60% - 68%
Statistics *Chi-Square* *df* *Asymp. Sig.*	 *.841* *1* *.359*
Note: the difference between the target audience and all others is *not* statistically significant.	

The most common conservation action reported was avoiding using appliances (52% of respondents who saw an alert), followed by shutting off unneeded lights (38%), and setting the thermostat to 78 degrees or warmer (25%) (Table -). Note that 27% of respondents who saw an alert specifically mentioned avoiding using appliances *during peak hours*, and 13% mentioned general energy conservation during peak hours.

Table -. Conservation Actions Taken in Response to Energy Conservation Alert/Flex Alert

Conservation Action	% of All Respondents	% of Respondents Who Saw Alert
Saw alert and conserved (specific actions listed below)	**22%**	**64%**
Turned off unneeded lights	13%	38%
Avoided using appliances *during peak hours*	9%	27%
Avoided using appliances (no time period specified)	9%	25%
Set thermostat to 78 degrees or higher	8%	22%
Conserved energy *during peak hours*	5%	13%
Saw alert but did not conserve	**12%**	**36%**
Did not see alert	**66%**	**N/A**
Note: respondents could indicate that they took more than one conservation action.		

4.4.3 Potential Improvements to Program

Most Effective Channels to Communicate Alerts

Respondents were asked to identify the most effective channels to inform them that an immediate reduction in energy usage is needed that day. The most popular media channels for alert messages were television, radio, and email. Television was the top choice of 46% of respondents; radio was the second most common preference (17%), followed by an email message (13%). Very few respondents chose text messaging (5%) or highway message boards (2%). Respondents who did not select email as their

preferred means of communications were also asked if they would still be willing to share their email address for the purposes of energy conservation alerts; an additional 19% indicated that they would be willing to share their email address.

Respondents in the target audience had slightly different preferences for media channels to communicate alerts, as compared to the rest of the population. While television is still the first choice of most (36% of target audience vs. 49% of the rest of the population), the target audience has stronger preferences for email (20% vs. 11%) and newspaper (10% vs. 7%) than the rest of the population.[62] In addition to the stronger preference for email, members of the target audience were also more willing to share their email address (21%) than all other respondents (18%) even if it wasn't their most preferred means of communications.[63] These differences *are* statistically significant and suggest that 41% of the target audience would be willing to receive email alerts; the program should continue efforts to collect email addresses for the purposes of issuing Flex Alerts. Approximately one-quarter (24%) of all respondents indicated that they did not have an email address; however, just 11% of the target audience (as defined above) did not have an email address.

About three-quarters of respondents (77%) reported that somebody in their household is at home during weekday afternoons (when conservation is most needed).

Credible Entities to Issue Alerts

Most respondents believe that the FYPN program is sponsored by the electric utilities (47%) or the California state government (26%). Similarly, respondents chose the electric utilities and the California state government as the two most credible entities to issue energy conservation alerts (chosen by 39% and 26% of respondents, respectively), followed by local TV or radio newscasters (13%).

Significantly more respondents in the target audience (32%) chose the California state government as the most credible entity than did the rest of the respondents (25%). The electric utilities were still preferred over the state government, however, with 42% of the target audience selecting them as the most credible entity to issue the alerts.

These results indicate that the electric utilities should continue to be a part of the "face" of the Flex Your Power NOW! program. However, showing a strong partnership with the California state government may further enhance the credibility of the program's messages.

4.4.4 Respondent Characteristics

Attitudes Towards Environmental and Social Issues

The baseline survey asked a series of questions about respondents' attitudes and beliefs regarding recycling behavior, environmental issues, participation in environmental causes and community organizations, and other topics. Table - and Table - summarize respondents' agreement or disagreement with a series of statements.

[62] The differences are statistically significant (22.764. 11, .019).

[63] The difference is statistically significant (23.769, 3, .000).

Table -. Agreement with Environmental Statements

	I frequently recycle	I participate in environmental causes	Global warming is an important environmental issue	The choices I make regarding electricity usage can make a difference in greenhouse gas emissions	Comfort is more important to me than saving energy in my home*
Strongly agree	56%	15%	44%	37%	7%
Agree	36%	41%	35%	43%	29%
Disagree	7%	31%	12%	8%	44%
Strongly Disagree	2%	12%	6%	5%	17%

*Note that the final column represents an *anti-environment* statement (unwillingness to sacrifice personal comfort) meaning that disagreement with that statement would indicate a more pro-environment opinion.

Columns do not total to 100% because "don't know" responses were not tabulated.

Table -. Agreement with Pro-Community Involvement Statements

	I participate in community meetings and organizations regularly	I should do my part to help fellow Californians
Strongly agree	9%	36%
Agree	26%	55%
Disagree	42%	5%
Strongly Disagree	22%	1%

Note: Columns do not total to 100% because "don't know" responses were not tabulated.

We analyzed the psychographic characteristics to see if certain environmental or community beliefs were correlated with a willingness to conserve energy in response to an alert, and found that respondents who agree with the statement "I should do my part to help fellow Californians" were significantly more likely to report taking action in response to an energy conservation alert than those who disagreed with the statement. Similarly, respondents who agree with the statements "I frequently recycle," "I participate in environmental causes," and "Global warming is an important environmental issue" were also more likely to report taking conservation actions (Table -).

Table -. Behavior Change in Response to Alert – by Agreement with Pro-Environmental and Pro-Community Statements

% Who Conserved in Response to Alert	I frequently recycle	I participate in environmental causes	Global warming is an important environmental issue	I should do my part to help fellow Californians
Strongly agree	61%	62%	63%	71%
Agree	70%	71%	69%	63%
Disagree	72%	65%	65%	29%
Strongly Disagree	33%	35%	24%	0%
Statistics				
Chi-Square	*6.343*	*18.847*	*22.208*	*23.185*
df	*3*	*5*	*5*	*5*
Asymp. Sig.	*.096*	*.002*	*.000*	*.000*

The target audience is significantly more likely to agree with all four pro-environmental psychographic statements (recycling, participation in environmental causes, importance of global warming, energy usage makes a difference in emissions) than the rest of the population (Table -).

Table -. Agreement with Pro-Environmental Psychographics – by Target Audience

	% Who Agree with All Four Pro-Environmental Psychographics
Target Audience (college-educated female homeowners)	60%
All Others	45%
Total	**48%**
Statistics	
Chi-Square	*17.473*
df	*1*
Asymp. Sig.	*.000*
Note: the difference between the target audience and all others *is* statistically significant.	

Home Characteristics

The majority of respondents (70%) were homeowners as opposed to renters. Most respondents lived in single family homes (72%) or apartments (17%).[64]

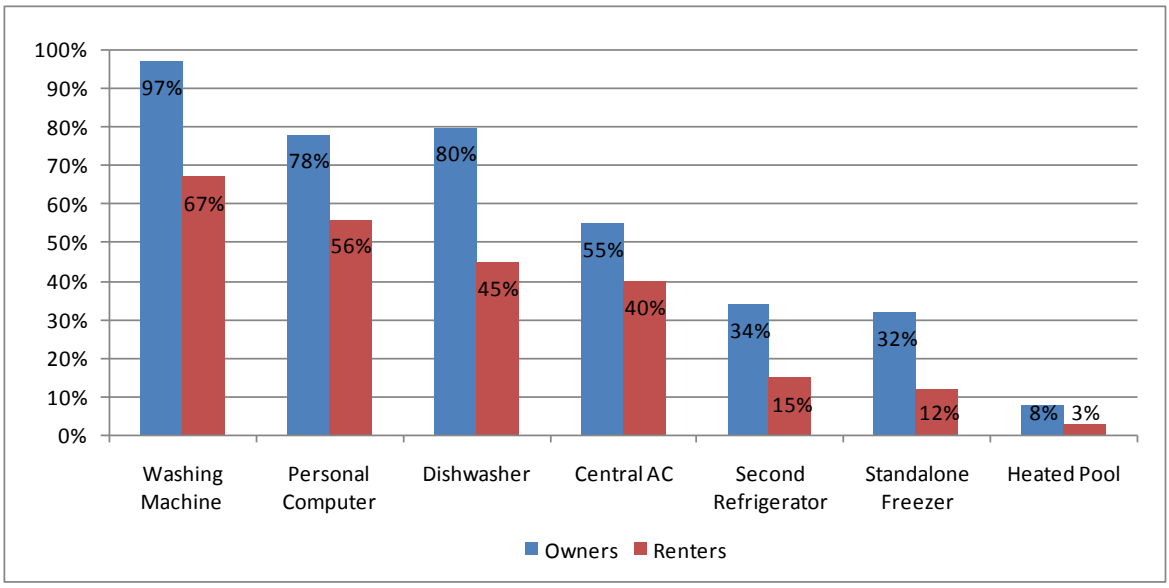
According to the survey data, renters were significantly more likely to change their behavior in response to an alert than were homeowners. 61% of homeowners and 74% of renters who saw an alert reported taking action in response.[65] This result implies that targeting homeowners is not necessarily an effective way to reach those people most likely to respond to an alert; however, renters generally have less energy-

[64] According to the U.S. Census Bureau, 58% of Californians are homeowners, and also 58% of Californians live in single family homes.

[65] The difference is statistically significant (6.829, 3, .078).

using equipment and thus cannot provide as much demand response as most homeowners, even if they are willing to conserve what they can. As shown in Figure -, 55% of homeowners have central air conditioning, compared to 40% of renters.

Figure -. Appliances in Household by Homeownership



Respondents were also asked about their appliance usage during the afternoons on summer work days (Table -). Just under one-quarter of all respondents have central air conditioners that are running during the afternoons on summer workdays, and approximately one-third of all respondents do at least two afternoon loads of laundry or dishwasher runs per week, indicating that a sizable percentage of the population could potentially reduce their electricity demand during summer workday afternoons by avoiding the use of these and other appliances.

Table -. Appliance Usage During Summer Workday Afternoons

Equipment	% of All Respondents	% of Respondents Who Have That Equipment
Central air conditioner	22%	43%
Pool pump	3%	42%
Home computer	31%	43%
Washing machine (at least 2 loads per week)	31%	36%
Dishwasher (at least 2 runs per week)	15%	18%

Demographics

Geography. Over half **(**59%) of the respondents live in the four largest designated market areas (DMAs) in California: Los Angeles, San Francisco, Sacramento, and San Diego. Table - summarizes the

percentage of respondents in each DMA and compares to the actual population. By design, the sample for the survey oversampled the smaller designated market areas (DMAs) in order to obtain more statistically valid results for *each* DMA. Because the four largest DMAs received the majority of the funding for the Flex Your Power NOW! media purchases, we have tabulated the results in the preceding sections by DMA size (larger vs. smaller DMAs) to more accurately represent the California population as a whole.

Table -. Respondents by DMA

DMA	% of Actual Population	% of Respondents
Large DMAs	**87%**	**59%**
Los Angeles	48%	18%
San Francisco	21%	15%
Sacramento	10%	13%
San Diego	8%	13%
Small DMAs	**13%**	**41%**
Fresno	5%	8%
Monterey	2%	6%
Santa Barbara	2%	6%
Bakersfield	1%	6%
Chico-Redding	1%	6%
Eureka	0%	6%
Palm Springs	1%	4%
Note: percentages do not add to 100% due to rounding.		

Race/Ethnicity. Over two-thirds of respondents (68%) identified themselves as white; 19% were Hispanic. Blacks and Asians represented 4% and 3% of the respondents, respectively.[66]

Education. The majority of respondents had at least a high school degree (86%). 42% had a college degree or higher; 14% had a graduate degree. Just 12% had less than a high school degree.[67]

Gender. The gender balance achieved by the survey was 61% females, 39% males.

4.4.5 Conclusions from Post-Summer Survey Results

The following bullets present the key findings of the post-summer survey effort.

- About 15% of respondents specifically recalled seeing a Flex Alert, and 20% recalled seeing an energy conservation alert message (but did not associate the phrase "Flex Alert" with what they

[66] According to U.S. Census Bureau data, 61% of the California population is white, 12% is Asian, 6% is black, and 36% is Hispanic (note that those categories add up to more than 100% because "Hispanic" is not considered a race by the Census Bureau, but rather a designation of country of origin).

[67] According to U.S. Census Bureau data, 80% of Californians have a high school degree or higher, and 30% have a college degree or higher.

saw). Respondents who are part of the target audience (defined as college-educated female homeowners) had significantly higher levels of Flex Alert recall than all other respondents (23% vs. 13%); however, the target audience did *not* report significantly higher recall of generic energy conservation alerts.

- The majority of respondents who saw an alert (61%) understood that the alert pertained to a particular time of day (as opposed to all day); 61% of those respondents correctly identified that time of day as afternoon. The percentage of respondents who understood that the alert pertained to a particular time of day actually dropped from the baseline survey result of 73% of phone respondents.

- Many respondents still do not understand that the alert is asking for conservation *that day* (even if they understand the time-of-day aspect). When asked to specify *when* they took conservation actions in response to the alert, 39% of respondents who conserved said they did so *every day* and 95% said that they have continued taking action to conserve electricity since seeing the alerts. These results indicate that respondents are interpreting the alerts as requests for long-term lifestyle changes, not short-term, emergency behaviors.

- Of those respondents who recalled seeing an alert, 64% took some kind of conservation action in response. Of *all* respondents, 22% saw at least one alert message and reduced their electricity consumption in response to the alert. This is an increase from the baseline survey result of 15% of phone survey respondents (a statistically significant difference). The most common response was avoiding using appliances (52% of respondents who conserved), followed by shutting off unneeded lights (38%) and setting the thermostat to 78 degrees or warmer (25%).

- The psychographic most strongly correlated with having taken conservation actions in response to the alert was agreement with the statement "I should do my part to help fellow Californians." 71% of respondents who strongly agreed with that statement and 63% of those who agreed took conservation actions in response to the alert that they saw. Similarly, respondents who agree with the statements "I frequently recycle," "I participate in environmental causes," and "Global warming is an important environmental issue" were also more likely to report taking conservation actions.

4.5 Conclusions on Customer Awareness and Response

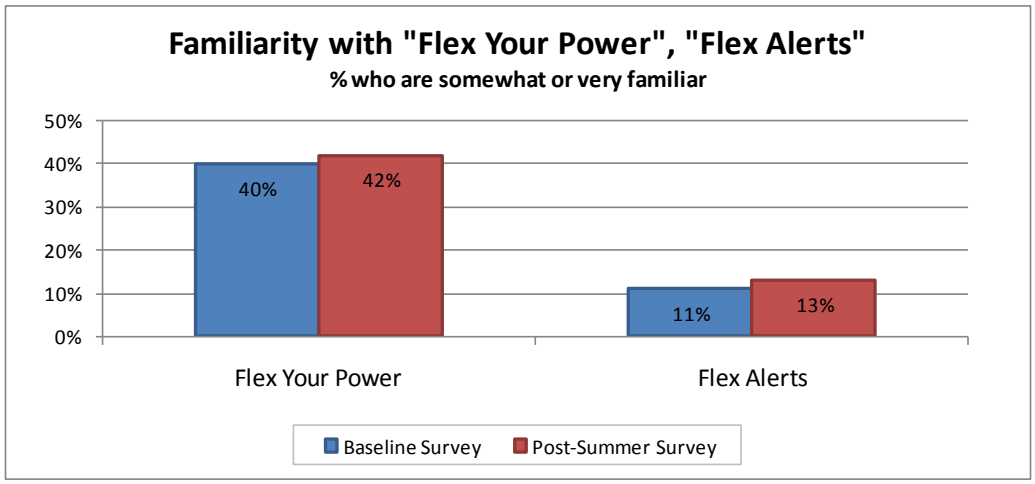
Summit Blue compared results from the baseline survey, post-event survey, and the post-summer survey to assess changes in familiarity with, recall of, and behavior change in response to Flex Alerts over the course of the 2007 campaign. Since focus group and survey results indicated that some respondents are thinking of Flex Your Power NOW! or Flex Alerts when they hear the phrase "Flex Your Power" or see the FYP logo, comparisons are presented for familiarity with, recall of, and behavior change in response to Flex Your Power ads as well.

All baseline survey data presented in this section is from the *phone* baseline survey, not the web baseline survey, to allow a more direct comparison. Note that the post-event survey was less detailed than either the baseline or post-summer survey and thus not all comparisons have data for the post-event survey. Summit Blue conducted t-tests to determine when changes over time are statistically significant at the 90% confidence level.

4.5.1 Awareness and Recall of Flex Your Power and Flex Alert Campaigns

The share of respondents who are very or somewhat familiar with the phrase "Flex Alert" increased from the baseline result of 11% to 13% in the post-summer survey. This increase is slight but it is statistically significant. It is important to note that the phrase "Flex Alert" and the 2007 "Flex Alert: Save Energy Now!" logo have not yet been consistently used, so it is unsurprising that familiarity with the phrase remains quite low (see Section) for discussion on the various terms and logos used by the IOUs and media outlets during the 2007 Flex Alerts). Familiarity with the phrase "Flex Your Power" increased as well, from 40% to 42%; however, this increase was *not* statistically significant. Figure - summarizes the increases in familiarity with the phrases "Flex Your Power" and "Flex Alert" over time.

Figure -. Familiarity with "Flex Your Power" and "Flex Alert" Over Time



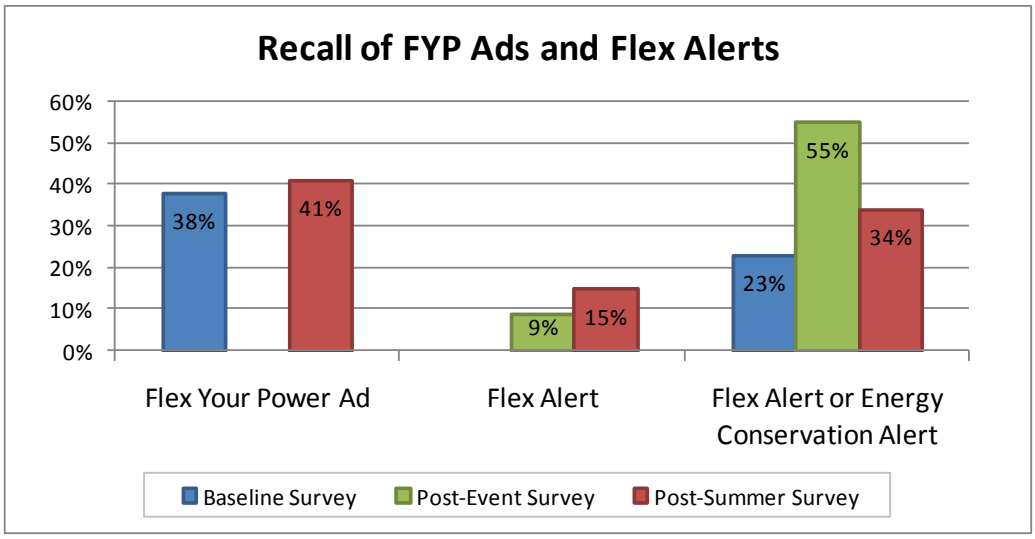
Note: the change in familiarity from the baseline survey to the post-summer survey *is* statistically significant for the "Flex Alert" phrase, but *is not* for the "Flex Your Power" phrase.

Recall of Flex Your Power ads increased from 38% in the baseline survey to 41% in the post-summer survey (a statistically significant increase). Recall of Flex Alerts increased from 9% in the post-event survey to 15% in the post-summer survey.[68] Recall of energy conservation alerts (including Flex Alerts) also increased from 23% in the baseline survey to 34% in the post-summer survey. Over half (55%) of post-event survey respondents recalled seeing an energy conservation message over the past four days; however, this number is likely skewed upwards due to intense media attention given to the possibility of blackouts in southern California (see Section for more discussion of media coverage of the Flex Alert). It should be noted that the 34% of post-summer survey respondents who recalled seeing an energy conservation alert is composed of the 15% who specifically recalled seeing a Flex Alert and then another 20% who recalled seeing an energy conservation alert that asked for electricity conservation that day, but did not specifically associate the term "Flex Alert" with the message that they saw.[69]

[68] The baseline survey did not specifically ask about Flex Alert recall (the phrase was not commonly used in the 2006 campaign), only recall of energy conservation alerts.

[69] The 15% who saw a Flex Alert plus the 20% who saw a generic energy conservation alert sums to 34% (rather than 35%) due to rounding.

Figure -. Recall of "Flex Your Power" and "Flex Alert" or Energy Conservation Alerts Over Time

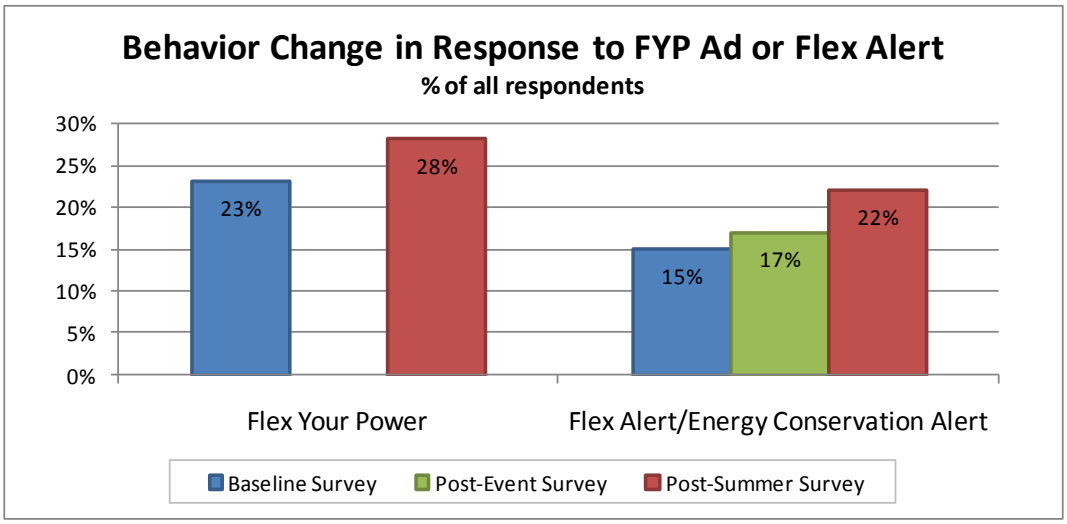


Note: the changes in recall from the baseline survey to the post-summer survey *are* statistically significant for both Flex Your Power ads and for Flex Alerts/energy conservation alerts.

4.5.2 Behavior Changes in Response to Ads and Alerts

Given the significant increase in recall of Flex Alerts (or other energy conservation alerts), the share of all respondents who both saw an alert and conserved in response to the alert also increased significantly, from 15% of baseline respondents to 17% of post-event survey respondents to 22% of post-summer survey respondents. The post-summer survey result indicates that over one-fifth of all Californians took energy conservation actions in response to an alert they saw over the 2007 summer months. However, the survey results indicated that a significant portion of respondents who said that they conserved may not have been conserving *at the needed time* (see Section below for more discussion on respondents' understanding of the time-sensitive nature of Flex Alerts). The share of respondents who saw a Flex Your Power ad and took some kind of action in response to it increased also, from 23% of all baseline survey respondents to 28% of post-summer survey respondents (Figure -).

Figure -. Behavior Change in Response to Flex Your Power Ads and Flex Alerts Over Time (% of All Respondents)



Note: the changes in response from the baseline survey to the post-summer survey *are* statistically significant for Flex Alerts/energy conservation alerts, but are *not* statistically significant for Flex Your Power ads.

Both the baseline and post-summer surveys found that respondents who exhibited pro-environmental opinions (such as agreement with the statement "Global warming is an important environmental issue") tended to conserve in response to the Flex Alert more than those who disagreed with the pro-environmental statements. However, the post-event survey found that those who agree with the statement "Global warming is a problem" were *not* significantly more likely to conserve than those who disagreed with the statement.

The post-summer survey found that the psychographic statement most strongly correlated with responding to the Flex Alert request for conservation was "I should do my part for fellow Californians." Nearly three-quarters (71%) of respondents who agreed strongly with that statement reported taking action in response to the alert that they saw. This indicates that the "California pride" sentiment invoked by the blue 2007 thank-you ad resonated with viewers and should be continued.

4.5.3 Understanding of Flex Alerts

The focus groups and all three survey efforts revealed that there is a significant portion of consumers who do not understand the time-sensitive nature of the Flex Alert request for conservation. Just over half (52%) of baseline survey respondents who saw an alert stated that conservation was needed at a particular time of day (not all day) *and* correctly identified that time of day as afternoon. Similarly, 48% of post-event survey respondents stated that the alert asked for conservation during a particular time of day. Just 37% of post-summer survey respondents who saw an alert knew that conservation was needed at a particular time of day *and* correctly identified that time of day as afternoon, indicating that perhaps the 2007 ads were less effective than the 2006 ads in conveying the time-sensitive nature of the alert. These results indicate that while a significant portion of respondents who saw alerts did conserve in response, possibly more than half of these conservers were not conserving *at the correct time of day*.

Further complicating the question of how many respondents are actually reducing peak demand during Flex Alerts is the post-summer survey result that showed that 39% of respondents who conserved said they did so *every day* and 95% said that they have continued conserving electricity since seeing the alerts.

These results indicate that even if respondents understand the *time of day* that conservation is needed, they still interpret the alerts as calling for long-term lifestyle changes, not emergency conservation *today*.

Focus group participants indicated that the mention of global warming in the Flex Alert ads caused them to think that the ads were requesting long-term lifestyle changes to fight the long-term consequences of global warming.

5. INDIRECT IMPACT ANALYSIS

5.1 Introduction

This section describes the task of attempting to put bounds on the indirect impact[70] of the Flex Your Power NOW! (FYPN) program for the summers of 2006 and 2007. During the project initiation meeting, the Summit Blue team was directed to allocate a limited budget ($40,000) to this preliminary impact analysis to provide an order of magnitude estimate of the likely response, as well as identifying potentially promising areas for future study. In taking this approach, the DRMEC and Summit Blue recognized that this was a difficult task and that the outcome of the research effort might not result in impact estimates within conventionally accepted confidence intervals. Three approaches were taken in this analysis, with the respective objectives of estimating: 1) the aggregate impact of demand response (DR) programs in California (approach A); 2) the self-reported residential impact of the FYPN program (approach B); and 3) the observable residential impact of the FYPN program from customer-level interval load data (approach C). The first and broadest approach was to examine California Independent System Operator (CAISO) level forecast and actual load data to identify the order of magnitude of the aggregate demand response on FYPN-event days. The second approach examined customer surveys to estimate the impact from residential air conditioner event response. The third was an econometric examination of customer-level residential interval load data. The following sections describe these approaches.

5.2 Approach A: Aggregate Demand Response Estimation on Event Days

The first approach to impact estimation was to estimate the aggregate DR impact on the entire CAISO system. CAISO produces a day-ahead hourly system load forecast each day, which does not include anticipated DR. The difference between the forecast and the actual load is an estimate of the aggregate demand response in the CAISO system. If the DR impact was well observed, then subtracting the reported impacts of more countable DR programs from the aggregate response should leave as a remainder the impact of less countable DR programs, such as price-responsive and voluntary programs.

5.2.1 Data Collection

The data required for this analysis were the CAISO load forecasts, CAISO loads, and the DR event calendars for the summers of 2006 and 2007.

[70] According to the California Energy Efficiency Evaluation Protocols, indirect impacts are those that result from "programs that seek to change the behavior of consumers and for which some level of gross energy and demand savings is expected. These programs are typically information, education, marketing, promotion, outreach or other types that may not have specified energy savings goals, but are still expected to provide energy impacts within their target markets." While the Energy Efficiency Evaluation Protocols do not cover this evaluation because FYPN is a demand response program, it was deemed appropriate to label the impacts of the program as "indirect impacts" based on the preceding definition.

CAISO Data

CAISO's database of load forecasts and actual system loads can be found at http://oasis.caiso.com. Two-day-ahead, day-ahead, and hour-ahead forecasts of the system-wide hourly load are all available. Day-ahead forecasts were deemed the most accurate *a priori* estimate of a day's loads because they have more accurate parameter values than the two day-ahead forecast (forecasts are more certain as the time horizon gets shorter), and are not adjusted for actual loads (which may include DR impact) as the hour-ahead forecasts are. The actual hourly loads for all hours in the months of June, July, August, and September for the years 2006 and 2007 were also collected. DR for a given day was defined as the difference between the day-ahead forecast peak load and the actual peak load:

$$DR_d = \max_h \left(Load_{forecast}(h,d) \right) - \max_h \left(Load_{actual}(h,d) \right)$$

where:

- d is the day { June 1, …, September 30, 2006 and June 1, …, September 30, 2007}
- h is the hour of the day {1,…,24}
- DR_d is the estimated demand response on day d
- $Load_{forecast}(h,d)$ is the day-ahead forecasted load at hour h on day d
- $Load_{actual}(h,d)$ is the actual load at hour h on day d

DR Event Data

FYPN event days for 2006 were collected from the FYPN website:
http://www.fypower.org/flexalert/now_events.html

Event days for 2007 were observed by monitoring press releases from CAISO during the summer of 2007. FYPN is only one of many DR programs across the state of California. Each utility provided a list of all non-FYPN DR event days during summer 2006 and 2007

Table - summarizes CAISO data on event days (both FYPN and non-FYPN for summer 2006 and summer 2007). The "DR Event Day" column indicates whether or not *any* DR events were called on that day. The "FYPN Event Day" column indicates whether or not a FYPN event was called on that day. In this table "DR Estimate" is simply the difference between the forecasted peak load and the actual peak load. Note that the DR estimate is sometimes less than zero, meaning that the actual peak load was greater than the forecasted peak load, even in the presence of DR programs.

Table -. DR event days in 2006 and 2007

Date	DR Event Day	FYPN Event Day	Day-Ahead Forecasted Peak Load (MW)	Actual Peak Load (MW)	DR Estimate (MW)
6/21/2006	X		41,033	40,488	545
6/22/2006	X	X	43,254	42,287	967
6/23/2006	X	X	43,468	41,971	1,497
6/26/2006	X	X	45,097	42,960	2,137
6/27/2006	X	X	44,052	40,377	3,675
6/28/2006	X	X	41,230	43,425	-2,195
7/13/2006	X		43,664	44,435	-771
7/14/2006	X	X	46,217	44,237	1,980
7/17/2006	X	X	48,238	46,292	1,946
7/18/2006	X	X	47,049	46,316	733
7/19/2006	X	X	46,604	45,749	855
7/20/2006	X		47,146	46,402	744
7/21/2006	X	X	47,078	48,977	-1,899
7/24/2006	X	X	52,336	50,198	2,138
7/25/2006	X	X	50,538	49,677	861
7/26/2006	X		49,471	47,604	1,867
7/27/2006	X		46,412	45,476	936
7/28/2006	X		43,241	42,732	509
8/9/2006	X		42,184	43,491	-1,307
8/31/2006	X		43,055	41,747	1,308
9/1/2006	X		42,630	41,236	1,394
9/6/2006	X		43,445	43,082	363
9/22/2006	X		31,694	31,168	526
6/13/2007	X		38,414	39,614	-1,200
6/14/2007	X		40,011	40,839	-828
7/2/2007	X		40,621	41,356	-735
7/3/2007	X	X	43,893	42,533	1,360
7/4/2007	X	X	42,308	39,382	2,926
7/5/2007	X	X	44,992	44,672	320
7/6/2007	X		44,154	43,663	491
7/9/2007	X		40,229	39,138	1,091
8/1/2007	X		42,566	41,587	979
8/21/2007	X		44,388	44,589	-201
8/22/2007	X		43,549	43,347	202
8/28/2007	X		44,794	45,745	-951
8/29/2007	X	X	48,195	48,494	-299
8/30/2007	X	X	49,572	47,731	1,841
8/31/2007	X	X	48,322	48,535	-213

5.2.2 Data Analysis

For the sake of model simplicity, only weekdays were considered.

Table - reports summary statistics for DR estimates for three categories of days:

1) **Non-Event Days:** no DR events were called;
2) **Event, Non-FYPN Days:** some DR events were called , but not FYPN events; or
3) **Event, FYPN:** DR events, including FYPN, were called.

Table -. Summary Statistics of CAISO DR Impact Estimates

Day-type	n	Mean DR Estimate (MW)	Minimum (MW)	Maximum (MW)	Standard Deviation (MW)	Standard Error (MW)
Non-Event	135	398	-2,476	4,361	1,019	88
Event, Non-FYPN	20	248	-1,307	1,867	936	209
Event, FYPN	18	1,035	-2,195	3,675	1,509	356

Note: all weekdays in the time periods of 6/1/06-8/31/06 and 6/1/07-8/31/07 were included in the analysis.

Days in which some DR events were called, but not FYPN events are difficult to consider because the number or types of programs called varied. These days were not considered in the following analysis. However, days on which FYPN events were called can be assumed to be days of the most critical DR needs, in which a maximum level of DR was called for. Thus, a good comparison is that between days on which no events were called, and days in which FYPN events (and therefore most DR programs) were called. Note, however, that this comparison only identifies the *aggregate* DR impact, not the impact from any individual DR program, including FYPN.

Regression analysis (using the ordinary least squares method) was used to determine the coefficients and standard error in the following equation.[71]

$$DR = \underset{93.4}{398.4} + \underset{272.4}{636.6}\, event \quad n = 153,\ R^2 = 0.035$$

Where *DR* is the estimated demand response, *event* is a binary variable equal to 1 if FYPN and other DR events were called, and equal to zero if no DR events were called, and n is the number of summer weekdays (both event and non-event) considered. Note that even on non-event days, the estimated DR is 398 MW. This implies that the CAISO day-ahead forecasts are biased high; on average the actual peak load is almost 400 MW less that the day-ahead forecast. From these results, the average aggregate DR on the CAISO system on FYPN event days is 637 MW. The 90% confidence interval for average aggregate DR is 189 MW to 1085 MW (636.6 +/- 1.645*272.4).

[71] The R^2 value is the fraction of variation in the data that is predicted by the model. The R^2 value of roughly 4% indicates that the model does not adequately capture all the causes of variation in the data, but there is still a statistically significant difference between event days and non-event days.

The Summit Blue team discussed this approach to DR estimation with an Operation Specialist in the Department of Grid Operations at CAISO in October, 2007. He concurred that the difference between the day-ahead forecast and the actual load was the best way to estimate DR. However, he acknowledged that even this would just be a "guesstimate" because of the large variation in load. He went on to say that from the operations perspective, demand response is "essentially noise".

The operations specialist also noted that distribution equipment often fails on hot days. Thus, some of the load shed that looks like DR might actually be due to power outages from failed distribution equipment.

IOU reports of DR program enrollment suggest a total available DR resource of approximately 2.5 GW.[72] When asked if 2.5 GW of available DR state-wide sounded correct, the specialist said that this sounded "about right or a bit high." He noted that CAISO only keeps track of available interruptible load, which is about 1 GW currently.

5.2.3 Conclusions from Impact Approach A

From this analysis of CAISO forecasted and actual peak loads on weekdays during the summers of 2006 and 2007, the estimated system-wide DR on event days in which FYPN events were called is between 200 MW and 1,100 MW. The FYPN impact can be expected to be some fraction of this estimated aggregate impact. For reference, the total anticipated DR resource for 2007, as reported by the IOUs, was 1,613 MW of interruptible DR and 1,057 MW of price responsive DR (Faruqui and Hledik, 2007). Not all of this resource is called at the same time.

Recommendations for Further Research

This analysis of CAISO data was intended to be preliminary. If more resources were to be put into this analysis, a more detailed examination of data might provide a more accurate model; this would result in tighter bounds on the DR estimates. Primarily, a more accurate proxy for the forecasted peak demand (what the system load would be in the absence of DR) could possibly be developed – perhaps by modifying the day-ahead forecast based on day-of consumption during mid-peak hours or by adjusting the day-ahead forecast to account for differences between forecasted and actual weather.

Furthermore, a more detailed econometric model could be developed in which events for each individual DR program are represented by separate variables in order to discern the impact of individual programs. This would require more communication with utility representatives to identify exactly which programs called events on each day.

5.3 Approach B: Customer Survey Analysis

The FYPN program targets residential customers. In order to examine the self-reported FYPN response behavior, three customer surveys were conducted for Summit Blue Consulting by the Northwest Research Group: one at the beginning of summer 2007, one after FYPN events at the end of August 2007, and one conducted in late 2007/early 2008. These surveys are herein referred to as the *baseline*, *post-event*, and *post-summer* surveys, respectively. Customers were telephoned at random, but there was a bias towards smaller media markets to ensure a statistically significant number of data points in each media market. The full results of the three survey efforts can be found in Section ; the survey instruments are located in the appendices in Section . Survey results were combined with geographic, climatic, appliance saturation,

[72] Note that not all DR programs are called at the same time.

and air conditioner load data to estimate the impact of residential central air conditioner load curtailments in response to FYPN events.

Air conditioner loads were the focus of this analysis because they are significantly larger than the other two residential loads during the weekday afternoon and evening hours targeted by FYPN media: unnecessary lighting and large appliances (e.g., washing machines and dishwashers). The appendix in Section provides an estimate by the California Energy Commission of end-use electricity demand during peak periods in the summer of 2005. Of the 54 GW peak load, 22 GW (40%) was estimated to come from the residential sector. Table - summarizes the residential peak load by end uses targeted by FYPN. Of residential end uses, air conditioning represents by far the largest share (at least 68%[73]) of peak load targeted by the FYPN program.

Table -. Residential End Uses Targeted by FYPN

Residential End Uses	MW	% of FYPN-Targeted Load
Air Conditioning	11,154	68%
Dishwashers	331	2%
Electric Dryers	1,196	7%
Washing Machines	135	1%
Miscellaneous (includes lighting)	3,568	22%
Total Peak Demand Targeted by FYPN	**16,384**	**100%**
Other End Uses (Not Targeted by FYPN)	5,383	N/A
Total Residential Peak Demand	**21,765**	**N/A**
Source: Demand Analysis Office, California Energy Commission. http://www.energy.ca.gov/electricity/peak_loads.html		

5.3.1 Data Collection

Several sources of data were used for this analysis. References for all of these sources can be found in Section .

- Survey results were obtained from the survey house, Opinion Research Northwest.
- Hourly weather data for the summers of 2006 and 2007 for sites representative of each of the 16 climate zones defined by the California Energy Commission were collected from the National Oceanic and Atmospheric Administration (NOAA).
- Population data (by zip code) were collected from the United States Census Bureau and are based on the 2000 Census.
- Media market (i.e., Designated Market Area or DMA) definitions (by zip code) were collected from Nielsen Media Research.
- Central air conditioner saturation data by climate zone were collected from the Residential Appliance Saturation Survey conducted by KEMA during 2002 and 2003.
- Central air conditioner load estimates by time of day for several California climates were derived from data in Lovelace, Jump, and Bradley (2007).

[73] Because lighting is aggregated with other loads not targeted by the FYPN campaign, the exact percentage cannot be determined from this source.

The estimation of DR impact based on analysis results was conducted twice for each survey, once giving no response credit (as specified in the subsections below) to respondents who answered "Do not know" or "Refuse to answer" to pertinent questions and a second time giving partial credit for these responses. There were no significant differences in the result from the no-credit and partial-credit cases. Only results from the no-credit case are presented here.

5.3.2 Baseline Survey Analysis

As discussed in Section , a baseline survey was conducted in May/June 2007 to measure Californians' recall of and response to 2006 FYPN events. A series of steps were taken to translate the baseline survey responses into a state-wide DR impact from central air conditioner usage behavior. This analysis was based on the phone baseline survey only, which obtained 1122 completes.

Step 1: Survey Results

Survey results were summarized to determine the portion of households (1 respondent = 1 household) correctly responding to FYPN events in each of the California media markets. The appendix in Section lists the questions of interest for this analysis and tabulates the responses by media market for each question.

Based on these results, each individual respondent was assigned values to the following variables:

HasCAC

- 1 if respondent has a central air conditioner
- 0 if not
- 0 (first case), 0.15 (second case) if respondent did not know or refused to answer

AlertsNoticed

- Number of events in 2006 noticed by respondent, limited to a maximum of 18 (the number of events in 2006)
- 0 (first case), 3 (second case) if respondent did not know or refused to answer

TimeSpecific*TimeOfAction (a product of two separate questions: one on whether the event was day-specific and time-specific, and one on what time of day if time specific)

- 1 if respondent thought that the event was during a particular time of day, and that that time of day was the afternoon or evening
- 0.25 if respondent thought the event was all day
- 0 (first case), 0.2 (second case) if the respondent knew that the event was during a particular time of day but didn't know or refused to say what time of day.
- 0 if the respondent thought that the event was during the night or morning, or if the respondent did not know or refused to say what time of day

TurnedDownAC

- 1 if respondent turned down (or off) air conditioner in response to event
- 0 if not

ActionFrequency

- 1 if respondent always responded to FYPN events
- 0 if respondent never responded to FYPN events
- 0.5 if respondent sometimes responded to FYPN events

- 0 (first case), 0.15 (second case) if respondent didn't know or refused to say how often they responded to FYPN events

Based on these variable values, a response likelihood was computed for each survey respondent:

$$Likelihood = HasCAC * \left(\frac{AlertsNoticed}{18} \right) * TimeSpecific * TimeOfAction * TurnedDownAC * ActionFrequency$$

Therefore, the variable *Likelihood* is an estimate of how likely a particular respondent is to turn down their central air conditioner at the correct time, and only at the correct time[74], of a particular FYPN event. For a particular media market, the sum of *Likelihood* for all respondents, divided by the number of respondents with central air conditioning, is then the estimate of the portion of central air conditioners responding effectively to an FYPN event, or the likelihood of a single central air conditioner responding effectively.[75]

$$Likelihood_{MM} = \frac{\sum_i Likelihood_{MM_i}}{\sum_i HasCAC_{MM_i}}$$

Where

- *MM* is the media market {1,…,12}
- MM_i is the *i*th respondent in media market *MM*
- $Likelihood_{MM}$ is the likelihood of a single central air conditioner responding effectively to a particular event
- $Likelihood_{MMi}$ is the likelihood of respondent *i* in media market *MM* responding effectively to a particular event
- $HasCAC_{MMi}$ is the likelihood that respondent *i* in media market *MM* has a central air conditioner

In order to determine bounds on these likelihood estimates, the composition of non-responders (i.e., customers with central air conditioning with a likelihood of zero) and responders (i.e., customers with non-zero likelihood) was assumed to follow a binomial distribution. The portion, p, of the population with central air conditioning that has non-zero likelihood values is estimated to be the same as that found in the survey; the standard error of this estimate is:

$$\sqrt{\frac{p*(1-p)}{n}}$$

[74] If a respondent turned down their thermostat in the morning, there would be little load reduction by the afternoon or evening, when the load reduction was desired. Studies of residential thermostat setback demand response programs show a significant decrease in demand response impact over the duration of an event.

[75] Note that no assumption is made regarding how many air conditioners in the population were on in the first place. This calculation simply says what fraction of the air conditioners experienced a load reduction.

This standard error[76] is then used to compute the 90% confidence interval on the estimate of p. The average value of non-zero likelihood values was assumed for each non-zero respondent throughout the confidence interval.

Step 2: Response by Climate Zone

These likelihood-by-media-market values were converted into likelihood-by-climate-zone values using the California Energy Commission definitions of climate zones.[77] The appendix in Section provides the cross-tabulation of population by climate zone and by media market required for this step, as well as a map of climate zones. The likelihood in a particular climate zone is the average likelihood by media market, weighted by the population of each media market within the climate zone. For example, if a hypothetical climate zone has a total population of 1 million, with 750,000 people in media market A and 250,000 people in media market B, and if the likelihood values for media market A and B are 8% and 4% respectively, than the likelihood of the climate zone is 7% (8% * (750,000/1,000,000) + 4%*(250,000/1,000,000)). The likelihood for each media market and each climate zone are stated below in Table - and Table -, respectively. The name of each DMA is included, as is the name of the most populous city entirely within the boundaries of each climate zone (some large cities, such as Los Angeles and San Diego, span more than one climate zone each and are not used as zone descriptors).

Table -. Baseline Survey: Likelihood by Media Market

Media Market	DMA Name	Lower Bound	Estimate	Upper Bound	# of Nonzero Responders
1	Bakersfield	0.23%	3.58%	6.93%	3
2	Chico-Redding	0.00%	0.14%	0.37%	1
3	Eureka	0.00%	0.00%	0.00%	0
4	Fresno-Visalia	0.00%	0.00%	0.00%	0
5	Los Angeles	0.08%	1.52%	2.96%	3
6	Monterey-Salinas	0.00%	0.00%	0.00%	0
7	Palm Springs	0.00%	0.00%	0.00%	0
8	Sacramento-Stockton	0.12%	2.08%	4.05%	3
9	San Diego	0.00%	0.38%	0.83%	2
10	San Francisco-Oakland-San Jose	0.00%	0.20%	0.53%	1
11	Santa Barbara-Santa Maria-San Luis Obispo	0.00%	0.00%	0.00%	0
12	Yuma-El Centro	0.00%	2.78%	7.78%	1

Note: some media markets have 0% likelihood values because they did not have any respondents who reported taking conservation actions at the correct time.

[76] This estimate of the standard error can be inaccurate when p is small (such as this case), but was deemed to be adequate for this preliminary analysis.

[77] The California Energy Commission defines 16 climate zones across the state. Areas within each climate zone have similar climates; state building energy codes are specific to climate zones.

Table -. Baseline Survey – Likelihood by Climate Zone

Climate Zone		Lower Bound	Estimate	Upper Bound
1	Eureka	0.00%	0.04%	0.11%
2	Santa Rosa	0.00%	0.20%	0.52%
3	San Francisco	0.00%	0.17%	0.44%
4	San Jose	0.00%	0.18%	0.47%
5	Santa Maria	0.00%	0.00%	0.00%
6	Huntington Beach	0.08%	1.42%	2.76%
7	Oceanside	0.00%	0.40%	0.87%
8	Santa Ana	0.08%	1.52%	2.96%
9	Whittier	0.08%	1.52%	2.96%
10	Riverside	0.03%	0.66%	1.31%
11	Redding	0.06%	1.12%	2.24%
12	Sacramento	0.07%	1.41%	2.78%
13	Fresno	0.06%	1.00%	1.94%
14	Lancaster	0.09%	1.60%	3.11%
15	Indio	0.00%	0.77%	2.13%
16	Truckee	0.10%	1.71%	3.32%

Note: some climate zones have 0% likelihood values because they did not have any respondents who reported taking conservation actions at the correct time.

These tables can be interpreted as follows: the estimated likelihood of a particular central air conditioner in Media Market 5 responding effectively to a FYPN event is 1.52%; the likelihood of a particular central air conditioner in Climate Zone 12 responding effectively to a FYPN event is 1.41%; etc.

Step 3: Effective Number of Central Air Conditioners Responding and Average Load Reduction per Air Conditioner

The likelihood by climate zone values were multiplied by the total number of central air conditioners in each climate zone, extrapolated from survey results from the 2002-2003 Residential Appliance Saturation Survey[78], to give the effective number of central air conditioners in each climate zone responding correctly to an FYPN event.

The average load reduction from a 6° F setback on the thermostat of a single central air conditioner during an FYPN event in climate zone *CZ* was estimated from data in a study on air conditioner cycling

[78] KEMA, "California Statewide Residential Appliance Saturation Survey" http://websafe.kemainc.com/RASSWEB/DesktopDefault.aspx

programs[79], which showed average household air conditioner loads at various temperatures by sampling from residences across the SCE territory on multiple days This data shows an average steady state load reduction of 0.4 kW per household for an outdoor temperature decrease of six degrees, which is fairly consistent across climate zones. We assume an equivalent effect from outdoor temperature decrease and thermostat temperature increase: both are reducing the difference between outdoor temperature and indoor thermostat setpoint. Furthermore, to account for homes in which the air conditioner was not on, we assume that two-thirds of homes in the sample had their air conditioners on; therefore, we assume a load reduction of 0.6 kW per currently running air conditioner.

Step 4: Total Demand Response from Residential Central Air Conditioners

Finally, the total estimated DR in each climate zone from residential central air conditioner behavior is extrapolated from survey results as follows:

$$DR_{CZ} = Likelihood_{CZ} * Units_{CZ} * AverageLoadReduction_{CZ}$$

Where

- *CZ* is the climate zone {1,…,16}
- DR_{CZ} is the total estimated DR in climate zone *CZ* from residential central air conditioner behavior
- $Likelihood_{CZ}$ is the likelihood of a single central air conditioner in climate zone *CZ* responding correctly to an FYPN event
- $Units_{CZ}$ is the number of central air conditioner units in climate zone CZ
- $AverageLoadReduction_{CZ}$ is the average load reduction (kW) from a 6° F thermostat setback[80] on a central air conditioner during an FYPN event in climate zone *CZ, here assumed to be 0.6 kW.*

Table - summarizes these results. The "Load Reduction" columns are the products of likelihood, number of units, and average load reduction for each climate zone, as described in the equation above.

[79] Lovelace, Ed, Corina Jump, and Kris Bradley, "Measuring the Load Impact of an Air Conditioner Cycling Program" *Proceedings of the 2007 Energy Program Evaluation Conference*, pp. 274 – 983, 2007.

[80] A six degree setback is assumed because the FYPN advertisement and other CAISO news releases have recommended turning setpoints to 78 degrees, and 72 degrees is a typical thermostat setpoint.

Table -. Estimated Impact Based on Baseline Survey

Climate Zone	Population*	Number Of CAC Units**	Residential A/C Load at Event Peak (MW)***	*Lower Bound (90% Confidence Interval)*		*Estimate*		*Upper Bound (90% Confidence Interval)*	
				Likelihood of an A/C Unit Responding To an Event	Load Reduction (MW)	Likelihood of an A/C Unit Responding To an Event	Load Reduction (MW)	Likelihood of an A/C Unit Responding To an Event	Load Reduction (MW)
1	152,636	991	0	0.00%	0.0	0.04%	0.0	0.11%	0.0
2	905,253	93,605	148	0.00%	0.0	0.20%	0.1	0.52%	0.3
3	3,682,534	102,699	65	0.00%	0.0	0.17%	0.1	0.44%	0.3
4	1,907,836	215,509	316	0.00%	0.0	0.18%	0.2	0.47%	0.6
5	386,234	18,510	20	0.00%	0.0	0.00%	0.0	0.00%	0.0
6	2,641,652	266,093	210	0.08%	0.1	1.42%	2.3	2.76%	4.4
7	1,971,808	208,641	182	0.00%	0.0	0.40%	0.5	0.87%	1.1
8	4,481,097	339,849	415	0.08%	0.2	1.52%	3.1	2.96%	6.0
9	5,808,931	763,018	1,503	0.08%	0.4	1.52%	7.0	2.96%	13.5
10	3,186,456	788,301	1,495	0.03%	0.1	0.66%	3.1	1.31%	6.2
11	857,300	214,296	510	0.06%	0.1	1.12%	1.4	2.24%	2.9
12	4,048,599	759,478	1,860	0.07%	0.3	1.41%	6.4	2.78%	12.7
13	1,939,416	511,043	1,269	0.06%	0.2	1.00%	3.1	1.94%	5.9
14	723,476	265,734	707	0.09%	0.1	1.60%	2.5	3.11%	5.0
15	524,545	123,379	358	0.00%	0.0	0.77%	0.6	2.13%	1.6
16	557,250	135,630	292	0.10%	0.1	1.71%	1.4	3.32%	2.7
total	**33,775,023**	**4,806,776**	**9,349**		**2**		**32**		**63**

**Population data is from the U.S. Census Bureau (by zip code) and California climate zone definitions (by zip code).*

*** The "Number of CAC Units" data is from the Residential Appliance Saturation Survey (KEMA, 2004).*

**** The "Residential A/C Load at Event Peak (MW)" data was computed by: 1) estimating average household CAC loads for each climate zone based on Lovelace, Jump, and Bradley (2007); 2) multiplying by the number of CAC units in each climate zone; and 3) scaling all values such that the statewide total was equal to the state-wide total estimated by the California Energy Commission (2005).*

This analysis results in an estimate of 32 MW of demand response from residential central air conditioners during a typical FYPN event in 2006, and a 90% confidence interval of 2 MW to 63 MW.

5.3.3 Post-Event Survey Analysis

FYPN events were called on August 29, 30, and 31, 2007. A post-event survey was conducted from August 30 to September 9, 2007 (as discussed in Section). This section describes the series of steps taken to translate survey responses into a state-wide DR impact for residential central air conditioner usage behavior.

One of the questions in the survey asked if respondents had seen or heard an advertisement to conserve electricity *during the past four days*. However, many of the interviews were conducted more than four days after the last FYPN event. Arguably, respondents may not take the phrase "during the past four days" literally and instead interpret it to mean "recently". For this reason, two post-event survey analysis cases are conducted: 1) without considering the results from these later interviews (344 of the 615 datapoints were from days within four days of an FYPN event) and 2) considering all results.

Since results did not vary significantly between the two cases, results from the second case are presented here. Based on the insignificance of "do not know" and "refuse to answer" responses in the baseline analysis, no credit was given to these answers in the post-event survey analysis.

Step 1: Survey Results

Survey results were summarized to determine the portion of households (1 respondent = 1 household) correctly responding to FYPN events in each of the California media markets. The appendix in Section (Tabulation of Responses from the Post-Event Survey) lists the questions of interest for this analysis and tabulates the responses by media market for each question.

Based on these results, each individual respondent was assigned values to the following variables:

Action

- 1 if respondent raised air conditioner setpoint
- 1 if respondent went to a mall or other public space with air conditioning[81]
- 0 otherwise

TimeSpecific

- 1 if respondent knew that media alerts referred to a particular time of day
- 0.25 if respondent knew that media alerts referred to a particular day, or to a heat wave
- 0 otherwise

Based on these variable values, a likelihood value was computed for each survey respondent:

$$Likelihood = Action * TimeSpecific$$

The variable *Likelihood* therefore is an estimate of how likely a particular respondent is to change the setpoint of their central air conditioner at the correct time, and only at the correct time, of a particular

[81] This implies that a respondent went to one of these places to avoid needing to use their own air conditioner.

FYPN event. For a particular media market, the sum of *Likelihood* values for all respondents divided by the number of respondents is then the estimate of the portion of households reducing their central air conditioner load effectively in response to an FYPN event, or the likelihood of a single household responding effectively.

$$Likelihood_{MM} = \frac{\sum_{i} Likelihood_{MM_i}}{Customers_{MM}}$$

Where

- *MM* is the media market {1,…,12}
- MM_i is the *i*th respondent in media market *MM*
- $Likelihood_{MM}$ is the likelihood of a single household responding effectively to a particular event
- $Likelihood_{MMi}$ is the likelihood of respondent *i* in media market *MM* responding effectively to a particular event
- $Customers_{MM}$ is the number of customers in media market *MM*.

Note that, unlike the baseline survey, the post-event results include households that do not have central air conditioners, because there was no question regarding the presence of a central air conditioner at a household on the post-event survey.

Step 2: Response by Climate Zone

These likelihood values were converted into likelihood values as a function of climate zone using the cross-tabulation of population by climate zone and by media market provided in the appendix in Section (California Population by Media Market and Climate Zone). The likelihood for each media market and each climate zone is stated below. These tables can be interpreted as follows: the likelihood of a household in Media Market 4 responding effectively to an FYPN event is 3.21%; the likelihood of a particular household in Climate Zone 12 responding effectively to a FYPN event is 3.62%; etc.

Table -. Post-Event Survey Likelihood Values by Media Market

Media Market	DMA Name	Lower Bound	Estimate	Upper Bound	# of Nonzero Responders
1	Bakersfield	0.00%	0.00%	0.00%	0
2	Chico-Redding	0.00%	0.00%	0.00%	0
3	Eureka	0.00%	0.00%	0.00%	0
4	Fresno-Visalia	0.19%	3.21%	6.24%	3
5	Los Angeles	3.32%	8.33%	13.35%	7
6	Monterey-Salinas	0.00%	0.00%	0.00%	0
7	Palm Springs	0.00%	0.00%	0.00%	0
8	Sacramento-Stockton	0.90%	4.76%	8.63%	4
9	San Diego	0.20%	3.57%	6.94%	3
10	San Francisco-Oakland-San Jose	0.00%	1.19%	3.16%	1
11	Santa Barbara-Santa Maria-San Luis Obispo	0.00%	0.00%	0.00%	0
12	Yuma-El Centro	0.00%	0.00%	0.00%	0

Note: some media markets have 0% likelihood values because they did not have any respondents who reported taking conservation actions at the correct time.

For comparison, the baseline survey likelihoods have been restated in Table - as percentage of all households, not percentage of households with central air conditioning. This allows for a direct comparison of results and highlights the much greater response estimated in the post-event survey.

Table -. Post-Event Survey Likelihood Values by Climate Zone

Climate Zone		Baseline Survey			Post Event Survey		
		Lower Bound	Estimate	Upper Bound	Lower Bound	Estimate	Upper Bound
1	Eureka	0.00%	0.00%	0.00%	0.00%	0.26%	0.68%
2	Santa Rosa	0.00%	0.07%	0.17%	0.00%	1.18%	3.12%
3	San Francisco	0.00%	0.01%	0.03%	0.00%	1.00%	2.65%
4	San Jose	0.00%	0.06%	0.17%	0.00%	1.07%	2.84%
5	Santa Maria	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
6	Huntington Beach	0.02%	0.37%	0.72%	3.10%	7.78%	12.46%
7	Oceanside	0.00%	0.11%	0.23%	0.26%	3.66%	7.05%
8	Santa Ana	0.03%	0.46%	0.89%	3.32%	8.33%	13.35%
9	Whittier	0.04%	0.77%	1.49%	3.32%	8.33%	13.35%
10	Riverside	0.02%	0.51%	1.02%	1.27%	4.02%	6.76%
11	Redding	0.04%	0.81%	1.61%	0.45%	2.41%	4.37%
12	Sacramento	0.06%	1.07%	2.12%	0.59%	3.62%	6.87%
13	Fresno	0.06%	0.90%	1.74%	0.14%	2.31%	4.49%
14	Lancaster	0.08%	1.47%	2.86%	3.06%	7.75%	12.44%
15	Indio	0.00%	0.82%	2.29%	0.05%	0.13%	0.22%
16	Truckee	0.06%	0.97%	1.90%	1.54%	4.69%	7.84%

Note: some climate zones have 0% likelihood values because they did not have any respondents who reported taking conservation actions at the correct time.

Step 3: Total Demand Response from Residential Central Air Conditioners

Finally, the total estimated DR in each climate zone from residential central air conditioner behavior was estimated as

$$DR_{CZ} = Likelihood_{CZ} * Households_{CZ} * AverageLoadReduction_{CZ}$$

Where

- CZ is the climate zone {1,…,16}
- DR_{CZ} is the total estimated DR in climate zone CZ from residential central air conditioner behavior
- $Likelihood_{CZ}$ is the likelihood of a single central air conditioner in climate zone CZ responding correctly to an FYPN event
- $Households_{CZ}$ is the number of households in climate zone CZ
- $AverageLoadReduction_{CZ}$ is the average load reduction (kW) from a 6° F thermostat setback on a central air conditioner during an FYPN event in climate zone CZ, here assumed to be 0.6 kW.

Table - summarizes these results. The “Load Reduction” columns are the products of likelihood, number of units, and average load reduction for each climate zone.

Table -. Post-Event Survey Impact Estimates

Climate Zone	Population	Number of Households	Residential A/C Load at Event Peak (MW)	*Lower Bound (90% Confidence Interval)*		*Estimate*		*Upper Bound (90% Confidence Interval)*	
				Likelihood of an A/C Unit Responding To an Event	Load Reduction (MW)	Likelihood of an A/C Unit Responding To an Event	Load Reduction (MW)	Likelihood of an A/C Unit Responding To an Event	Load Reduction (MW)
1	152,636	53,934	0	0.00%	0.0	0.26%	0.1	0.68%	0.2
2	905,253	280,229	148	0.00%	0.0	1.18%	2.0	3.12%	5.2
3	3,682,534	1,341,131	65	0.00%	0.0	1.00%	8.0	2.65%	21.3
4	1,907,836	593,867	316	0.00%	0.0	1.07%	3.8	2.84%	10.1
5	386,234	130,962	20	0.00%	0.0	0.00%	0.0	0.00%	0.0
6	2,641,652	1,016,642	210	3.10%	18.9	7.78%	47.4	12.46%	76.0
7	1,971,808	776,193	182	0.26%	1.2	3.66%	17.0	7.05%	32.8
8	4,481,097	1,122,841	415	3.32%	22.4	8.33%	56.1	13.35%	89.9
9	5,808,931	1,515,040	1,503	3.32%	30.2	8.33%	75.8	13.35%	121.3
10	3,186,456	1,010,981	1,495	1.27%	7.7	4.02%	24.4	6.76%	41.0
11	857,300	297,833	510	0.45%	0.8	2.41%	4.3	4.37%	7.8
12	4,048,599	996,820	1,860	0.59%	3.5	3.62%	21.6	6.87%	41.1
13	1,939,416	570,713	1,269	0.14%	0.5	2.31%	7.9	4.49%	15.4
14	723,476	288,469	707	3.06%	5.3	7.75%	13.4	12.44%	21.5
15	524,545	114,711	358	0.05%	0.0	0.13%	0.1	0.22%	0.2
16	557,250	237,443	292	1.54%	2.2	4.69%	6.7	7.84%	11.2
total	**33,775,023**	**10,347,809**	**9,349**		**93**		**289**		**495**

**Population data is from the U.S. Census Bureau (by zip code) and California climate zone definitions (by zip code).*

*** The "Number of CAC Units" data is from the Residential Appliance Saturation Survey (KEMA, 2004).*

**** The "Residential A/C Load at Event Peak (MW)" data was computed by: 1) estimating average household CAC loads for each climate zone based on Lovelace, Jump, and Bradley (2007); 2) multiplying by the number of CAC units in each climate zone; and 3) scaling all values such that the statewide total was equal to the state-wide total estimated by the California Energy Commission (2005).*

This analysis results in an estimate of 289 MW of demand response from residential central air conditioner during the events of August 29-31, 2007, and a 90% confidence interval of 93 MW to 495 MW. This estimate is likely over-stated because event responders most likely did not respond on all three event days.

5.3.4 Post-Summer Survey Analysis

As discussed in Section , a post-summer survey was conducted in December 2007/January 2008 and obtained 1217 completes. The baseline survey and the post-summer survey used identical questions regarding Californians' recall of Flex Alerts and actions taken in response to them, so the analysis of the post-summer survey follows the exact same methodology as the baseline survey analysis, described in detail in Section . The results of the post-summer survey analysis are presented in this section with an abbreviated summary of the methodology; the reader is referred to Section for the complete methodology.

Step 1: Survey Results

Survey results were summarized to determine the portion of households (1 respondent = 1 household) correctly responding to FYPN events in each of the California media markets. Based on the insignificance of "do not know" and "refuse to answer" responses in the baseline analysis, no credit was given to these answers in the post-summer survey analysis. The appendix in Section lists the questions of interest for this analysis and tabulates the responses by media market for each question.

As in the baseline survey analysis, a response likelihood was calculated for each individual respondent, based on their responses to questions regarding whether they have central air conditioning, how many alerts they noticed in summer 2007, whether they understood the time-specific nature of the alert, whether they responded to the alert by turning down their AC, and whether they responded to some or all of the alerts noticed. The resulting response likelihood is an estimate of how likely a particular respondent is to turn down their central air conditioner at the correct time, and only at the correct time[82], of a particular FYPN event.

For a particular media market, the sum of the likelihood value for all respondents in that media market, divided by the number of respondents with central air conditioning, is then the estimate of the portion of central air conditioners responding effectively to an FYPN event, or the likelihood of a single central air conditioner responding effectively. Upper and lower bounds were calculated for each media market based on a 90% confidence interval. Table - summarizes the likelihood estimates by media market.

[82] If a respondent turned down their thermostat in the morning, there would be little load reduction by the afternoon or evening, when the load reduction was desired. Studies of residential thermostat setback demand response programs show a significant decrease in demand response impact over the duration of an event.

Table -. Post-Summer Survey: Likelihood by Media Market

Media Market	DMA Name	Lower Bound	Estimate	Upper Bound	# of Nonzero Responders
1	Bakersfield	2.58%	7.14%	11.70%	4
2	Chico-Redding	0.00%	2.90%	6.17%	2
3	Eureka	0.00%	0.00%	0.00%	0
4	Fresno-Visalia	0.00%	2.31%	5.39%	3
5	Los Angeles	2.51%	4.62%	6.72%	8
6	Monterey-Salinas	0.00%	0.00%	0.00%	0
7	Palm Springs	0.00%	2.44%	5.90%	1
8	Sacramento-Stockton	1.37%	4.03%	6.69%	7
9	San Diego	0.00%	0.00%	0.00%	0
10	San Francisco-Oakland-San Jose	1.66%	3.23%	4.79%	3
11	Santa Barbara-Santa Maria-San Luis Obispo	0.00%	0.00%	0.00%	0

Note: some media markets have 0% likelihood values because they did not have any respondents who reported taking conservation actions at the correct time.

Step 2: Response by Climate Zone

These likelihood-by-media-market values were converted into likelihood-by-climate-zone values using the California Energy Commission definitions of climate zones. The likelihood in a particular climate zone is the average likelihood by media market, weighted by the population of each media market within the climate zone. The likelihood for each climate zone is stated below in Table -. The name of the most populous city entirely within the boundaries of each climate zone (some large cities, such as Los Angeles and San Diego, span more than one climate zone each and are not used as zone descriptors).

Table -. Post-Summer Survey – Likelihood by Climate Zone

Climate Zone		Lower Bound	Estimate	Upper Bound
1	Eureka	0.36%	0.69%	1.03%
2	Santa Rosa	1.64%	3.19%	4.74%
3	San Francisco	1.39%	2.70%	4.02%
4	San Jose	1.49%	2.91%	4.32%
5	Santa Maria	0.00%	0.00%	0.00%
6	Huntington Beach	2.34%	4.31%	6.27%
7	Oceanside	0.04%	0.08%	0.12%
8	Santa Ana	2.51%	4.62%	6.72%
9	Whittier	2.51%	4.62%	6.72%
10	Riverside	0.92%	2.58%	4.61%
11	Redding	0.69%	3.47%	6.43%
12	Sacramento	1.38%	3.70%	6.05%
13	Fresno	0.72%	3.67%	7.16%
14	Lancaster	2.45%	4.63%	6.82%
15	Indio	0.05%	2.46%	5.87%
16	Truckee	1.73%	4.34%	7.03%

Note: some climate zones have 0% likelihood values because they did not have any respondents who reported taking conservation actions at the correct time.

Step 3: Effective Number of Central Air Conditioners Responding and Average Load Reduction per Air Conditioner

The Likelihood by Climate Zone values were multiplied by the total number of central air conditioners in each climate zone, extrapolated from survey results from the 2002-2003 Residential Appliance Saturation Survey[83], to give the effective number of central air conditioners in each climate zone responding correctly to an FYPN event.

The average load reduction from a 6° F setback on the thermostat of a single central air conditioner during an FYPN event in climate zone *CZ* was estimated from data in a study on air conditioner cycling programs[84], which showed average household air conditioner loads at various temperatures by sampling from residences across the SCE territory on multiple days This data shows an average steady state load reduction of 0.4 kW per household for an outdoor temperature decrease of six degrees, which is fairly

[83] KEMA, "California Statewide Residential Appliance Saturation Survey" http://websafe.kemainc.com/RASSWEB/DesktopDefault.aspx

[84] Lovelace, Ed, Corina Jump, and Kris Bradley, "Measuring the Load Impact of an Air Conditioner Cycling Program" *Proceedings of the 2007 Energy Program Evaluation Conference*, pp. 274 – 983, 2007.

consistent across climate zones. We assume an equivalent effect from outdoor temperature decrease and thermostat temperature decrease: both are reducing the difference between outdoor temperature and indoor thermostat setpoint. Furthermore, to account for homes in which the air conditioner was not on, we assume that two-thirds of homes in the sample had their air conditioners on; therefore, we assume a load reduction of 0.6 kW per currently running air conditioner.

Step 4: Total Demand Response from Residential Central Air Conditioners

Finally, the total estimated DR in each climate zone from residential central air conditioner behavior is extrapolated from survey results as follows:

$$DR_{CZ} = Likelihood_{CZ} * Units_{CZ} * AverageLoadReduction_{CZ}$$

Where

- *CZ* is the climate zone {1,…,16}
- DR_{CZ} is the total estimated DR in climate zone *CZ* from residential central air conditioner behavior
- $Likelihood_{CZ}$ is the likelihood of a single central air conditioner in climate zone *CZ* responding correctly to an FYPN event
- $Units_{CZ}$ is the number of central air conditioner units in climate zone CZ
- $AverageLoadReduction_{CZ}$ is the average load reduction (kW) from a 6° F thermostat setback[85] on a central air conditioner during an FYPN event in climate zone *CZ, here assumed to be 0.6 kW.*

Table - summarizes these results. The "Load Reduction" columns are the products of likelihood, number of units, and average load reduction for each climate zone, as described in the equation above.

[85] A six degree setback is assumed because the FYPN advertisement and other CAISO news releases have recommended turning setpoints to 78 degrees, and 72 degrees is a typical thermostat setpoint.

Table -. Estimated Impact Based on Post-Summer Survey

Climate Zone	Population*	Number Of CAC Units**	Residential A/C Load at Event Peak (MW)***	*Lower Bound (90% Confidence Interval)*		*Estimate*		*Upper Bound (90% Confidence Interval)*	
				Likelihood of an A/C Unit Responding To an Event	Load Reduction (MW)	Likelihood of an A/C Unit Responding To an Event	Load Reduction (MW)	Likelihood of an A/C Unit Responding To an Event	Load Reduction (MW)
1	152,636	991	0	0.36%	0.00	0.69%	0.00	1.03%	0.01
2	905,253	93,605	148	1.64%	0.92	3.19%	1.79	4.74%	2.66
3	3,682,534	102,699	65	1.39%	0.86	2.70%	1.67	4.02%	2.47
4	1,907,836	215,509	316	1.49%	1.93	2.91%	3.76	4.32%	5.58
5	386,234	18,510	20	0.00%	0.00	0.00%	0.00	0.00%	0.00
6	2,641,652	266,093	210	2.34%	3.74	4.31%	6.88	6.27%	10.01
7	1,971,808	208,641	182	0.04%	0.06	0.08%	0.10	0.12%	0.15
8	4,481,097	339,849	415	2.51%	5.12	4.62%	9.41	6.72%	13.70
9	5,808,931	763,018	1,503	2.51%	11.50	4.62%	21.13	6.72%	30.76
10	3,186,456	788,301	1,495	0.92%	4.36	2.58%	12.21	4.61%	21.81
11	857,300	214,296	510	0.69%	0.89	3.47%	4.46	6.43%	8.27
12	4,048,599	759,478	1,860	1.38%	6.28	3.70%	16.84	6.05%	27.58
13	1,939,416	511,043	1,269	0.72%	2.22	3.67%	11.24	7.16%	21.95
14	723,476	265,734	707	2.45%	3.90	4.63%	7.39	6.82%	10.88
15	524,545	123,379	358	0.05%	0.03	2.46%	1.82	5.87%	4.34
16	557,250	135,630	292	1.73%	1.41	4.34%	3.53	7.03%	5.72
total	**33,775,023**	**4,806,776**	**9,349**		**43**		**102**		**166**

**Population data is from the U.S. Census Bureau (by zip code) and California climate zone definitions (by zip code).*

*** The "Number of CAC Units" data is from the Residential Appliance Saturation Survey (KEMA, 2004).*

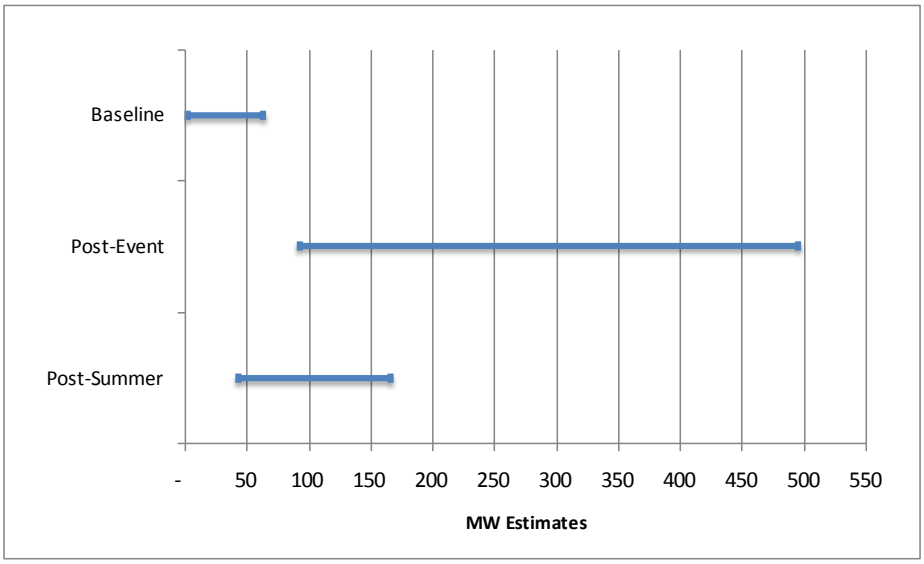
**** The "Residential A/C Load at Event Peak (MW)" data was computed by: 1) estimating average household CAC loads for each climate zone based on Lovelace, Jump, and Bradley (2007); 2) multiplying by the number of CAC units in each climate zone; and 3) scaling all values such that the statewide total was equal to the state-wide total estimated by the California Energy Commission (2005).*

This analysis results in an estimate of 102 MW of demand response from residential central air conditioners during a typical FYPN event in 2006, and a 90% confidence interval of 43 MW to 166 MW.

5.3.5 Conclusions from Impact Approach B

Analysis of the baseline, post-event, and post-summer surveys estimates a DR impact from residential central air conditioner response to FYPN events of 2 to 63 MW, 93 to 495 MW, and 43 to 166 MW, respectively.

Figure -. Range of FYPN AC Impact Estimates from Survey Analysis



As the likelihood that customers accurately recalled the number of 2006 event days in a baseline survey fielded in 2007 is extremely low, and the post-event survey had a smaller sample size and less detailed questions, the post-summer survey is likely to provide the best estimate of the three survey analyses. The different ranges do suggest that the media campaign is having an effect. It is critical to note that given the relatively small sample size, the arbitrary assignment of response values in determining the *likelihood* values, and the 0.6 kW per unit impact based on AC load control research, these values should be considered as *order of magnitude* estimates only.

Still, there is a large discrepancy between results from the three survey efforts. Three factors that could possibly contribute to this discrepancy are:

1) The baseline and post-summer surveys were much more detailed than the post-event survey. As a result, baseline and post-summer responses were discredited more often than post-event survey responses: for example, in the baseline and post-summer surveys, the likelihood product contains a term for the fraction of all events noticed for the year, whereas for the post-event survey, respondents are assumed to have noticed all three of the events in the recent heat storm.

2) Program impacts may have changed from 2006 (the year being assessed in the baseline survey) to 2007 (the year being assessed in the post-event and post-summer surveys).

3) Consumer recall of messages seen and actions taken typically diminishes over time, thus the post event survey, which was fielded directly after the August 2007 Flex Alert is likely to produce

better recall than the baseline survey which was administered a half a year after the 2006 summer events, or the post-summer survey which was fielded nearly four months after the August 2007 Flex Alert.[86]

Recommendations for Future Research

This preliminary analysis highlights the small number of respondents with non-zero likelihoods of adjusting their central air conditioning setpoints. This conclusion suggests that, although central air conditioning is by far the largest contributor to residential peak load, it may not be the only significant FYPN measure. For reference, 200 MW of DR impact spread over the 10 million households in California is an average household load reduction of just 20 watts: this is slightly more than the impact of switching off a single compact fluorescent light bulb, or 1/3 of the impact of turning off a single incandescent light bulb. Further research should consider additional measures.

Another improvement for analysis in the future would be to standardize the questions being asked across baseline and post-event surveys, and across evaluation year. The surveys should be designed specifically with this type of analysis in mind by including key questions such as:

- Which events were noticed (for post-event surveys) or how many separate event days were noticed (for the baseline survey)?
- Details of any measure: when was it done (all day, many days, time of day), how frequently (always, sometimes, never), and the extent of the impact (e.g., how many degrees set point was changed, how many and what kind of lights were turned off). These additions are subject to trade-offs in survey length and the ability to rapidly collect data.

Finally, given the small number of non-zero likelihood observations, the sample size should be increased, perhaps specifying a target number of non-zero likelihood respondents rather than a gross number of respondents. Furthermore, given the relatively small percentage of respondents that appear to be complying with the FYPN message, it may be wise to attempt better understanding of response (and non-response) biases in future surveys, through refusal surveys.

5.4 Approach C: Residential Interval Meter Data Analysis

The three California electric IOUs all provided residential customer-level interval load data. This section describes how the interval load data were used in an attempt to estimate the impact of FYPN events.

The data provided by the IOUs are from customers that are not aware that they are being monitored; these customers comprise a random, stratified sample.[87] The data provided for each customer included:

- a reference number unique to each customer;
- 15 minute, 30 minute, or hourly interval load data for each summer (June – September) day in 2006 and 2007; and
- a climate zone, zip code, or other geographic identifier.

[86] Note that Summit Blue did not yet have a contract to evaluate this effort during the summer of 2006.

[87] Depending on the utility, samples are stratified by geographic region or by volume of consumption (i.e., *low*, *medium*, and *high* consumption residences).

No customers in the samples provided were part of any other demand response program, such as air conditioner cycling or peak time rebate programs. Thus, the only demand response program these customers were exposed to was FYPN, and any demand response identified in the data on FYPN event days could be assumed to be a result of the FYPN program.

5.4.1 Data Preparation

Data were cleaned of the following irregularities, which suggest faulty monitoring equipment:

- strings of zeros
- strings of repeat values
- spikes followed by or preceded by zeros.

All three data sets were fairly clean: 99.6% of all PG&E observations were kept, more than 99.9% of all SDG&E observations were kept, and all SCE observations were kept.

Only weekdays were considered. 15-minute and 30-minute data were aggregated into hourly data.

5.4.2 Expected Impact

Before describing the analysis of the residential interval load data, it is useful to briefly consider the magnitude of the signal (i.e., FYPN impact) that is being searched for.

Customer-Level Impact

The expected impact (signal) of a six degree thermostat change is approximately 0.6 kW[88]. The average load during FYPN hours on non-event days (based on the residential interval load data provided by the IOUs) is roughly 1.5 to 2 kW and roughly 2.5 to 3 kW on event days. Assuming the survey results do not understate the impact of the program, the average signal to load ratio for an individual FYPN-responding customer is approximately 0.25.

Note that this is the expected impact for FYPN-responding customers. There is no way of knowing which of the customers in the load sample are responders; based on results of the post-event survey, at most about 10% of customers are responding to a given FYPN event, and only some fraction of those responders are taking action at the correct time.

Aggregate-Level Impact

In aggregate, an impact of 289 MW (the impact estimate from the post-event survey) in the residential statewide peak load of 20 GW[89] is a signal to load ratio of 0.014. While aggregation will smooth out the load variations and allow for more accurate load forecasting, the signal being searched for, even using the most optimistic scenario from the prior analyses, is much smaller than in the customer-level case.

[88] Based on an analysis of data provided in Lovelace, Jump, and Bradley (2007).

[89] The estimated residential load during peak times of 20 GW is based on California Energy Commission, "2005 Electricity Usage During Peak Periods", http://www.energy.ca.gov/electricity/peak_loads.html

5.4.3 Regression Models

A significant difficulty in developing an accurate model is the lack of an adequate control. FYPN events are overwhelmingly called because abnormally high demand is predicted, primarily due to weather conditions. Because FYPN events are called state-wide, there is no control group of residences that are not subject to FYPN requests on FYPN days, and there is no control group of days that is statistically similar to FYPN days. Thus, identifying a response to FYPN events is dependent on a model that can accurately predict demand on FYPN days by extrapolating from non-FYPN days.

For this analysis, the variable being predicted was the average customer load (kW) between 2 p.m. and 6 p.m., approximately the hours of load reduction requested by FYPN media. Herein, this is referred to as the *on-peak* load. A *mid-peak* load value is also derived; it is defined as the average load during the hours of 11 a.m. to 1 p.m. and 7 p.m. to 9 p.m. The difference between the predicted and actual loads is termed the *residual* (a positive residual implies a load greater than the forecasted load).

Two types of load-forecast models were used: a temperature-based model and a load-based model. For each an on-peak load forecast model was developed from regression analysis of non-event weekdays. This forecast model was then applied to the first day of each string of FYPN event days (June 22 and July 14, 2006, July 3 and August 29, 2007) and to the day prior to this. The second and subsequent days in each string of FYPN event days were not considered in this analysis; conventional wisdom holds that the willingness of participants to curtail load most likely decreases as events stretch into multiple days.

Temperature-Based Load Prediction

The temperature-based model predicts load for the current day based on temperature during the current and previous days.

$$On-peak = \beta_0 + \beta_1 Temp + \beta_2 Temp^2 + \beta_3 Temp^3 + \beta_3 Temp_{previous}{}^4$$

Where

- *On-peak* is the average load (kW) between the hours of 2 p.m. and 6 p.m.
- β are the estimators in the regression model
- *Temp* is the maximum temperature (°F) for the day in the customer's climate zone
- $Temp_{previous}$ is the average daily maximum temperature for the previous three days.

This model was applied separately to each customer. The determined estimators for each customer were then used to compute a forecasted on-peak load and a residual (actual on-peak load minus the forecasted on-peak load). Table - reports the statistics of this residual for each of the four event days considered and each of the four days prior to the event days. T-tests are performed on each pair of day-prior-to and day-of event days (e.g., June 21 and 22, 2006). The value *P* in the tables is the probability that the null hypothesis (that difference between the residuals on the non-event days and on the event days is not statistically significant) cannot be rejected. R-square values for individual customers were typically ~0.2, suggesting a poor choice of model.

Table -. Statistics on Temperature-Based Forecast Residual

	PGE							
date	6/21/2006	6/22/2006	7/13/2006	7/14/2006	7/2/2007	7/3/2007	8/28/2007	8/29/2007
event	*no*	*yes*	*no*	*yes*	*no*	*yes*	*no*	*yes*
N	747	743	683	825	740	738	727	8
average residual (kW)	0.027	0.008	0.146	0.190	-0.082	0.080	0.044	-0.292
standard deviation (kW)	0.912	1.051	0.816	0.914	0.745	0.838	0.800	0.823
standard error (kW)	0.033	0.039	0.031	0.032	0.027	0.031	0.030	0.291
T-statistic	0.362		0.987		3.919		1.063	
P	0.717		0.324		0.000		0.288	
	SCE							
date	6/21/2006	6/22/2006	7/13/2006	7/14/2006	7/2/2007	7/3/2007	8/28/2007	8/29/2007
event	*no*	*yes*	*no*	*yes*	*no*	*yes*	*no*	*yes*
N	1958	1958	1891	1925	1984	1983	2099	2094
average residual (kW)	0.012	0.084	0.104	0.189	0.083	0.104	0.192	0.237
standard deviation (kW)	0.859	0.901	0.919	1.068	0.933	0.979	0.907	0.957
standard error (kW)	0.019	0.020	0.021	0.024	0.021	0.022	0.020	0.021
T-statistic	2.537		2.630		0.695		1.572	
P	0.011		0.009		0.487		0.116	
	SDG&E							
date	6/21/2006	6/22/2006	7/13/2006	7/14/2006	7/2/2007	7/3/2007	8/28/2007	8/29/2007
event	*no*	*yes*	*no*	*yes*	*no*	*yes*	*no*	*yes*
N	330	328	330	330	529	529	596	596
average residual (kW)	-0.099	-0.086	0.131	0.148	-0.045	-0.095	0.170	0.151
standard deviation (kW)	0.767	0.761	1.033	1.202	0.956	1.062	0.976	1.051
standard error (kW)	0.042	0.042	0.057	0.066	0.042	0.046	0.040	0.043
T-statistic	0.219		0.195		0.815		0.313	
P	0.827		0.845		0.415		0.755	

Average values in Table - indicate how much greater the actual load was than the forecasted load, on average on non-event days. This is the forecast error. For day-prior and day-of events, the forecasted load is, on average, within ~0.2 kW of the actual load. Note that this is an order of magnitude larger than average anticipated FYPN DR signal (based on analysis of the baseline and post-event surveys). More significantly, the standard errors of the residuals are approximately 0.02 to 0.04 kW, or approximately the magnitude of DR signal being searched for. In other words, the uncertainty in how much the forecast model is off by is roughly equal to the expected average DR per household.

Interestingly, in three cases, there *is* a statistically significant difference between residuals at the 10% significance level ($P < 0.10$). However, in all of these cases, the residual increases on the day of the event, implying the forecast model tends to under-predict load on extreme days.

No conclusions as to the impact of FYPN can be made from the results of the temperature-based analysis. This is primarily due to the large variation in values of the difference between the actual and forecast load. This large variation does not allow for the distinction between forecast error and event impact.

Load-Based Load Prediction

The load-based model predicts load for the current day based on on-peak load during the previous five days, and the mid-peak load during the current day and the previous five days.

$$OnPeak = \beta_0 + \beta_1 AvgOnPeak + \beta_2 MidPeakDifference$$

Where

- *OnPeak* is the average load (kW) between the hours of 2 p.m. and 6 p.m.
- β are the estimators in the regression model
- *AvgOnPeak* is the average value of on-peak variable over the past five weekdays
- *MidPeakDifference* is the difference between the mid-peak value for the current day, and the average mid-peak value of the past five days

The purpose of the *MidPeakDifference* variable is to shift on-peak load-forecasts upward on days in which the mid-peak load is larger than the previous days' average.

As with the temperature-based model, this model was applied separately to each customer. The determined estimators for each customer were then used to compute a forecasted on-peak load and a residual (actual on-peak load minus the forecasted on-peak load). Table - reports the statistics of this residual for each of the four event days considered and the each of the four days prior to the event days. T-tests are performed on each pair of day-prior-to and day-of event days (e.g., June 21 and 22, 2006). The value *P* in the tables is the probability that the null hypothesis (that difference between the residuals on the non-event days and on the event days is not statistically significant) cannot be rejected. R-square values for individual customers were typically ~0.5 for this model, suggesting a better fit to the data then the temperature based model.

Table -. Statistics on Load-Based Forecast Residual

	PGE							
date	6/21/2006	6/22/2006	7/13/2006	7/14/2006	7/2/2007	7/3/2007	8/28/2007	8/29/2007
event	*no*	*yes*	*no*	*yes*	*no*	*yes*	*no*	*Yes*
N	776	832	839	844	814	814	731	10
average (kW)	0.212	0.291	0.167	0.199	-0.014	0.135	0.084	0.057
standard deviation (kW)	0.772	0.907	0.708	0.719	0.607	0.736	0.711	0.512
standard error (kW)	0.028	0.031	0.024	0.025	0.021	0.026	0.026	0.162
T-statistic	1.886		0.921		4.474		0.162	
P	0.060		0.357		0.000		0.871	
	SCE							
date	6/21/2006	6/22/2006	7/13/2006	7/14/2006	7/2/2007	7/3/2007	8/28/2007	8/29/2007
event	*no*	*yes*	*no*	*yes*	*no*	*yes*	*no*	*Yes*
N	1984	1981	1968	1963	2009	2129	2128	2126
average (kW)	0.026	0.004	0.125	0.187	0.166	0.157	0.116	0.132
standard deviation (kW)	0.589	0.628	0.677	0.796	0.720	0.740	0.679	0.727
standard error (kW)	0.013	0.014	0.015	0.018	0.016	0.016	0.015	0.016
T-statistic	1.149		2.643		0.394		0.742	
P	0.251		0.008		0.694		0.458	
	SDG&E							
date	6/21/2006	6/22/2006	7/13/2006	7/14/2006	7/2/2007	7/3/2007	8/28/2007	8/29/2007
event	*no*	*yes*	*no*	*yes*	*no*	*yes*	*no*	*Yes*
N	330	328	330	331	532	601	598	599
average (kW)	-0.005	-0.036	0.106	0.165	0.105	0.106	0.141	0.184
standard deviation (kW)	0.530	0.528	0.711	0.972	0.853	0.768	0.767	0.801
standard error (kW)	0.029	0.029	0.039	0.053	0.037	0.031	0.031	0.033
T-statistic	0.762		0.894		0.016		0.960	
P	0.446		0.372		0.987		0.337	

Results from the load-based model are qualitatively similar to those from the temperature-based model. Again, in three cases, P is less than 0.10, indicating a statistically significant difference between the non-event and event day residuals in a pair, yet in each case, the residual on the event day is larger than on the non-event day. This does not suggest that events are causing an increase in consumption, but rather that these predictive models underestimate the increase in demand on event days, which increases the residual on these days. The standard errors in the load-based model are smaller than the standard errors in the temperature-based model, suggest that the load-based model is a more stable (under) predictor.

The load-based model does lend itself well to an aggregate analysis. Here, instead of regressing on each customer individually, data for large groups of customers is aggregated. Customers were grouped by utility and climate zone for this analysis, under the rationale that FYPN may have been more influential in particular regions, as suggested by the survey results. The results are shown in Table - as the estimated average response, in kW, per customer. The number of customers in the sample per climate zone and date is shown in the table as well. The estimated response is the difference between the residual on the day prior to the event and the residual on the day of the event.

Table -. Estimated Impact of Select FYPN Events

Utility	Climate Zone	Event Date							
		6/22/2006		7/14/2006		7/3/2007		8/29/2007	
		Impact	n	Impact	n	Impact	n	Impact	N
PGE	1					-0.257	22		
	2	-0.083	53	-0.038	56	-0.201	55		
	3	0.019	269	0.073	273	0.025	263	0.01	3
	4	-0.251	102	-0.065	104	-0.2	104	-0.043	2
	5	0.042	19	-0.007	19	0.101	17	0.273	1
	11	-0.033	68	-0.156	68	-0.214	68	1.801	2
	12	0.015	178	0.059	178	-0.039	176		
	13	0.142	153	-0.082	158	0.073	148	0.045	4
SCE	6	0.052	732	-0.105	729	-0.041	812		
	8	0.048	702	-0.061	699	-0.009	727	0.077	722
	13	0.062	49	0.049	47	-0.061	43	0.455	46
	14	-0.07	123					0.345	117
	15	0.104	430	-0.097	421	0.025	471	0.022	482
SDGE	7	-0.008	125	-0.015	125	0.013	271	0.009	269
	10	0.051	144	-0.093	144	-0.093	267	0.096	265
	14	0.089	64					0.043	73

This table shows that, even in relatively large aggregates (e.g., SCE climate zones 6 and 8), a reliable estimate of impact is still elusive. However, the R-square values in the climate zone aggregates were typically ~0.95, suggesting that a load-based model can be quite accurate if customers are aggregated.

5.4.4 Conclusions from Impact Approach C

The preliminary analysis of residential interval load data was inconclusive. Normal variation in individual and aggregate load is much larger than the impact signal being searched for. Further complicating the problem is the lack of a control group: load on FYPN event days is significantly different than load on non-FYPN event days, and all customers are theoretically subject to FYPN signals. For this reason, load

forecasts for event days are extrapolations of load behavior on non-event days. Distinguishing between forecast model error and actual event response was not possible in this approach.

Recommendations for Further Research

Two promising approaches for further analysis are:

1. Improved aggregate models: The predictability (R-square ~0.95) of aggregate load from this preliminary analysis suggests that an improved aggregate model could provide the additional certainty needed to distinguish between forecast error and actual demand response. Other aggregations may also be considered; for example, customers likely to have air conditioner (based on large load sensitivity to temperature).

2. Improved individual models: Customers that are likely responders can be identified, based on particular load characteristics. These customers could then be analyzed separately. However, there are complications with this approach, notably:

    - **Not all customers whose loads are lower than expected on event days are responding to events.** For example, some customers may have an air conditioner that runs at rate capacity when the ambient temperature is 100 degrees. When the temperature increases to 105 degrees, the air conditioner cannot increase its output and the customer's load remains at the level it was when the temperature was 100.

    - **Examination of the distribution of observed FYPN impact values in an econometric model does not provide information on *why* values are positive (higher than expected loads) or negative (lower than expected load)**. Distinguishing between intentional response to a FYPN event and statistical variation requires more information.

5.5 Conclusions from Impact Analysis and Recommendations for Future Work

This section described three approaches to impact estimation used for the 2006-2007 FYPN program. Each of the three approaches taken complements the others. The CAISO analysis (approach A) frames the system-wide demand response on FYPN event days (~200 to 1100 MW) for all DR programs deployed on those days. The survey analysis (approach B) estimates an indirect impact of 2 to 63 MW (midpoint of 32 MW) in 2006, 93 to 495 MW (midpoint of 289 MW) based on 2007 post-event surveying, and 43 to 166 MW (midpoint of 102 MW) based on 2007 post-summer surveying, reasonable fractions of the system-wide aggregate response.[90] The interval load analysis (approach C) concludes that any impact of the FYPN program is too small to identify using this method.

The impact estimates summarized above supply a first cut at the possible levels of indirect impacts from the FYPN program. However, due to the preliminary nature of the analysis and the spread of the results, no specific impact estimate can be established based on these analyses.

[90] The highest of these three, based on the post-event survey, is recognized as being potentially biased upward because the shorter survey instrument was less detailed and thus provided fewer opportunities to discredit respondents (e.g., the baseline and post-summer surveys included a term for the fraction of all events noticed, while the post-event analysis assumed that respondents noticed all three events in the recent heat storm).

Note that this effort focused on air conditioning response and did not attempt to calculate effects from turning off unnecessary lights or shifting appliance use. The remaining question, then, is whether the self-reported impact is *overstated*, and if so, by how much.[91]

This impact estimation analysis was intended to be preliminary in nature. Both the CAISO and residential interval load data analyses illustrate that forecast error is relatively large and makes the relatively small expected FYPN signal difficult or impossible to detect. Still, the resource limitations of this analysis did not allow an exhaustive examination of data; it is possible that additional analyses of the existing data would lead to more conclusive results. An exhaustive analysis of the data at hand was not possible. Further analysis of existing data might isolate the incremental impact of individual DR programs within the CAISO data, and provide more precision in the analysis of the residential interval load data.

Promising areas for future work include:

CAISO data:

- A detailed econometric analysis of all DR events called on all days
- Improved on-peak load forecasts that consider day-of shoulder-peak consumption

Survey data (baseline, post-event, and post-summer):

- Examination of all activities listed, not just central air conditioning
- Changes to future survey design, including larger sample sizes to capture more non-zero likelihood respondents, more detailed questionnaires to more accurately estimate measure impact per household, and standardized questioning across baseline and post-event surveys and from evaluation year to evaluation year

Residential Interval Load Data:

- Development of improved forecast models for aggregate and individual analyses
- Development of a process for identifying probable FYPN responders

[91] For example, Hagler Bailly (1999) includes results of a California statewide residential telephone survey on energy efficiency devices and behavior and an on-site verification of approximately 10% of the sites. Of the sites verified, significant over- and under-reportings were both identified. Unplugging or removing a second refrigerator was the only measure in the survey that did not involve acquiring new equipment (such as compact fluorescent light bulbs or energy efficient windows) and provides the most direct comparison to FYPN measures. The results of the on-site verification are illuminating: 2% of sites said that they had unplugged/removed a second refrigerator, and were verified. Eight percent of sites said that they did this measure, but on-site verification did not confirm this. 85% of sites said that they did *not* do this, and that was verified on-site. Five percent said that they did not do this, but on-site inspection showed that they *had*.

6. CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

This section focuses on overarching themes and major findings of the evaluation. More detailed conclusions on each thematic area of evaluation (Program Goals and Implementation, Customer Awareness and Response, and Impact Analysis) are presented in the conclusions of their respective sections in the report (Sections 3, 4, and 5).

A number of overarching themes emerged during the course of the evaluation.

1. All parties interviewed expressed the view that coordination between the program implementer, CAISO, and IOUs has improved significantly from previous years, but there is still room for additional improvement by all parties, particularly in the areas of event notifications and coordination of web-based messaging.
2. Most Californians still have a difficult time understanding that conservation[92] is needed more on some days than others. It appears that the concept of peak usage (relating to a time of day) is better understood than the need for load reduction on specific days. For some, the FYPN messages are interpreted as requesting long-term lifestyle changes, not short-term behaviors to avoid emergencies.
3. Flex Your Power and Flex Your Power NOW! may be *too* closely integrated, contributing to confusion between long-term energy efficiency strategies (such as purchase of energy-efficient appliances) and short-term demand response.
4. Despite this confusion, consumer recall of Flex Alerts increased significantly from 2006 to 2007.
5. The target audience (defined by the larger FYP campaign) may include those most willing to conserve but may not be reaching those who are most willing *and also able* to respond to alerts; generally speaking, someone needs to be home during peak hours to adjust thermostat settings or turn off unneeded lights and appliances.
9. Inconsistent and frequently changing program names and logos contribute to confusion in the marketplace and weaken the FYPN message. Different entities (FYP, CAISO, the IOUs, the media) used a wide variety of names and logos during the August Flex Alert event, including the FYP logo, the old FYPN logo, and the new Flex Alert: Save Energy Now! logo, as well as the phrases "power alert", "power emergency", "electrical emergency", and others.
6. Online advertising, text messaging, email, and other cost-effective social media channels are underutilized and could be better utilized to leverage the media buy.
7. Understanding program cost-effectiveness is complex. The value of the program may extend beyond simple peak load reduction. Political figures have used the program to stress the need for

[92] Responding to the requested actions of Flex Your Power NOW! may not technically be viewed as conservation by many utility professionals due to the snapback phenomenon; however, conservation is how Californians *understand* the request to reduce energy use on particular days at particular times. Focus groups and verbatim responses to survey questions confirmed that consumers use the terms "saving energy", "conserving", etc., when describing the requested actions. The use of this wording may not have been politically tenable in previous campaign years, but it appears to be resonating now.

building additional power plants in load constrained areas and at least one Flex Alert day in 2007 was called due to a transmission failure when a plane flew into a power-line tower.

Key findings by topic area are summarized below.

6.1.1 Program Goals and Implementation Strategy

- There does appear to be consensus that the FYPN effort is designed to increase awareness of the need for conservation during peak demand periods; however, there is less consensus on the nuances of program intent. Stakeholders disagree as to whether broad awareness of the program with potentially less demand response impact is preferable to having lower awareness in the general population but higher impacts (coming from those most able to contribute significant demand reduction). The program implementer believes that the primary intent of the program is behavior change on Flex Alert days, but that raising awareness is important also to give Californians the motivation and ability to respond to the alerts.

- There is significant concern about attribution and how to single out the effects of the FYPN advertisements as compared to education about peak pricing. This is especially relevant with rates such as the Peak Time Rebate, which is currently being rolled out in SDG&E territory and seems possible in SCE territory as well.

- The program implementation strategy should continue to strive for earlier upfront notification so that Californians have adequate time to modify their typical daily energy usage. Earlier notification of events to both the implementer and public would help place announcements about alert days in the nightly news, the night before conservation is needed.

- In 2006, FYPN ads only aired on nine out of 15 alert days due to the inflexible terms of the joint FYP/FYPN media buy.

- Designing the program to geotarget messaging could bring in more megawatts in critical areas. Thus on days when San Diego is suffering from unusually high temperatures, but the San Francisco Bay area is temperate, regional calls to action could be issued; similarly seasonal variations could also be accommodated.

- Combining the FYPN media buy with the FYP media buy appears to bring excellent purchased value, but does also limit the market segments that are reached by the ads to those selected as the primary target audience for the FYP campaign.

6.1.2 Customer Awareness and Response

- Both focus group and survey results indicate that the three major requested conservation actions promoted in FYPN messaging (shut off unneeded lights, set thermostat to 78 degrees or higher, and avoid using appliances until after 7 PM) are widely understood and easily recalled. However, most people do not understand that the conservation is requested for particular *days*, not just particular *times of day*.

- Focus group and survey results show that the California pride element of the current TV spots resonates well. There is some confusion about whether the global warming message ("prevent blackouts today and global warming tomorrow") leads Californians to believe that the requested actions are long-term rather than short-term in nature. While raising general awareness of the

importance of conserving during peak times is a step in the right direction, it is important that the alerts convey that conservation is especially important *today* (i.e., the day of the Flex Alert itself).

- Using a similar program name and a modified version of the FYP logo as the FYPN logo may contribute to the undesired effect of having Californians think FYPN is an "everyday" message, in that it appears so similar to the FYP logo that appears on television ads, bill inserts, and many other IOU-customer interactions year-round. Note that the program name and logo was changed for the 2007 season, although similarities between the FYP logo and the new Flex Alert logo remain and some stakeholders used the older logo styling in their messaging.

- Survey data show that 23% of Californians recalled seeing an energy conservation alert before summer 2007 (the term Flex Alert was not used consistently prior to 2007), and 34% recalled a Flex Alert or energy conservation alert based on post-summer surveying. Most commonly, Californians report seeing or hearing about the alert on television (75%), followed by radio (33%), newspaper (18%), websites (8%), and email (4%), based on post-summer surveying.[93]

- The majority of people who see an alert do conserve energy in response. Nearly two-thirds of both baseline survey respondents (63%) and post-summer survey respondents (64%) who recalled an alert reported taking action in response to the alert. Post-summer survey data indicate that renters are more likely to respond to alerts than homeowners; 74% of renters who saw an alert took conservation actions in response, compared to 61% of homeowners.

6.1.3 Effectiveness of Implementation Strategy and Likely Impacts

- Air time during broadly appealing summer television programs such as sporting events (e.g., Wimbledon, World Cup, All Star Game) and first-run cable programming was not purchased and could improve summer messaging reach. Many of the programs identified as high priority for the advertising (based on popularity with the target audience), such as Grey's Anatomy and CSI, would be in reruns during the summer season.

- In order to respond to a request for conservation, Californians may need to be at home or able to reach those in their homes (e.g., by phone) during the requested time period. Since the value-driven purchase of the FYPN media buy derives from the FYP purchase, the target audience is not focused solely on those that are home and able to receive the call to action during the peak hours in the afternoon.

- Analysis of the difference between CAISO forecasted and actual load data on both non-event days and Flex Alert days indicated that total system-wide demand response on Flex Alert days (including the effects of all DR programs) ranges from 200 to 1100 MW. Therefore, the indirect impact of FYPN would likely be some fraction of this estimated aggregate impact.

[93] Note that respondents may be recalling newspaper, TV, or radio *news stories* regarding the Flex Alert event as well as *paid* FYPN advertisements.

6.2 Recommendations

6.2.1 Recommendations for Program Design and Delivery

As discussed above, consumers report increased awareness of Flex Alerts and the requested conservation behaviors, and the majority of consumers who recall an alert report taking action in response to the alert. These achievements are especially notable when viewed through the lens of the high cost of media in California and the fact that energy and the environment remain low-intensity issues (often subservient to more pressing issues such as the economy[94]). Despite these positive findings, Summit Blue identified several areas of potential improvement for future program design:

- In the future, the program could be designed to generate larger impacts in areas that are particularly load constrained, using advanced geotargeting techniques with online advertising and cable networks. By focusing on constrained areas, additional value could be generated by the program.

- It may be more effective to expand the target audience for FYPN to include those that are home during the day and able to reduce electrical demand. For instance, according to the California Statewide Residential Appliance Saturation Study, a significantly higher percentage of households which include children and/or senior citizens use electrical appliances during peak times than homes without children or seniors.

- Television ads must continue to emphasize that conservation is particularly needed *today* (i.e., the day of the Flex Alert itself).

- During the media purchasing negotiations, additional premiums associated with being able to switch out ads more quickly should be considered to ensure that ads run on all Flex Alert days.

- Future program design must consider and address the possibility of message confusion with the advent of Peak Time Rebate type rates.

- The program should work to improve and increase social media efforts to leverage the large media presence. As an example, text message subscribers on the FYPN site did not receive any Flex Alert announcements, possibly leading to feelings of disenfranchisement. Being able to use the site to forward the message to friends was a program improvement in 2007.

- The use of electronic outdoor media (such as Amber Alert road signs) should be favored over static outdoor media (i.e., traditional billboards) so that messaging conveys the immediacy of the call to action in the Flex Alerts. However, in areas that are load constrained, traditional billboards, though imperfect, may be cost-effective.

- Website coordination between FYPN, CAISO, and the IOUs must increase. Announcements of Flex Alert days by IOU websites should match actual alert days, and FYPN, the IOUs, and

[94] A recent Gallup poll found that the percentage of Americans favoring environmental protection over economic growth has dropped significantly as fears of recession loom. http://www.gallup.com/poll/105715/Half-Public-Favors-Environment-Over-Growth.aspx.

CAISO should be willing to link to each other's websites. CAISO website should include links to more information on energy conservation (e.g., on the fypower.org website), as many of the news media website referrers readers to the CAISO website rather than FYPower.org or the IOUs' sites. Web statistics analyzing referral pages and click-throughs should be tracked in detail and reported in future years.

- Additional local news media outreach should occur prior to the summer season so that FYPN graphic elements and specific talking points are prepared, thereby reducing confusion about "electrical emergencies" and other phrases inconsistent with the empowering message of the FYPN campaign.

- Community action kits and plans could be created to assist in getting the word out. Partnering with local governments would be a potentially useful strategy. Note that this would not be inconsistent with the first filed advice letter for the program, which recommended grassroots activism coupled with a statewide media umbrella. Forming partnerships with local schools and rec centers could assist in reaching parents on Flex Alert days at an ideal point in time, as they pick their children up from school in the afternoon or from summer activities.

- Focus group results were consistent with survey data indicating that both the state and utilities are perceived as appropriate and important leaders in this effort. Other necessary messaging is competing with FYPN: messaging about cooling centers for the elderly and infirm and Spare the Air pollution advisories both typically occur during FYPN events. Coordination between these efforts does occur but increased coordination could improve each effort's reach.

6.2.2 Recommendations for Further Research

The following bullets present some of the key research questions to consider for the 2008 evaluation, based on findings from the PY 2006-2007 evaluation.

- How effective was the **implementation strategy**?
    - Were recommendations from the PY 2006-2007 evaluation regarding *media planning and purchasing* put into effect?
    - Were recommendations from the PY 2006-2007 evaluation regarding the use of cost-effective *social media leverage strategies* put into effect?[95]
    - Were recommendations from the PY 2006-2007 evaluation regarding *geotargeting* in critical regions put into effect?
- How effective is the campaign at increasing **customer awareness**?
    - Is the *target audience* properly defined? Are the customers most *likely and able* to respond to alerts being reached at the proper time? This builds on previous findings that segmentation strategies should be reconsidered.
    - How effectively is the program targeting *small business customers*?
    - Has *consumer awareness* increased since the 2007 campaign?

[95] The 2007 campaign used a "tell a friend" email strategy that differed from the earlier email notification efforts. Options were also provided in 2007 to receive a text message to the phone. This research would evaluate these strategies and recommend improvements.

- How do customers respond to the **new creative strategy** of the 2008 ads and alerts? Are they more or less effective than the previous ads?
    - Do customers understand the *time-specificity* of the message? Do they understand that behaviors are requested not just for a specific time of day but also a specific day (today)?
    - How *motivating* are the messages? Do customers respond more to the global warming/environmental message or to the California pride appeal (if retained)?
    - Are the messages sufficiently distinguishable from the more general energy efficiency messaging of the FYP campaign?
- What estimates can be made from **customer behavior**?[96]
    - What *conservation actions* are customers taking, and when?
    - How are members of the target audience *seeking and sharing information* on Flex Alert days?
- What are the key **barriers to participation** or message compliance?
- How is the program interacting with other demand response and real-time pricing programs?

[96] Promising avenues of further research into the program impacts include: detailed econometric analysis of all DR events called on all days; expanded analysis of residential customer survey data to include actions beyond air conditioning setbacks; and development of improved forecast models for aggregate and individual analyses of residential interval load data. See Section for more detailed recommendations for further impact analysis research.

7. APPENDICES

7.1 Data Collection Instruments

7.1.1 Focus Group Discussion Guide

Objectives:

- Opinions of FYPN advertisements – are they persuasive and will they prompt the decision to act?
- Assess attitudes toward FYPN concept including beliefs about importance, benefits to them and beyond, barriers to compliance, and potential motivations to participate (note: will be used to help make recommendations on how to improve ads)
- Discuss difference between alerts vs. messages. Qualitatively determine best media for each and qualitatively understand rationale behind consumers' views on media choice

Introductions **10 minutes**

- Name, who's at home with you (kids, spouses, pets)
- Who is at home during the day?
- What kinds of big energy appliances do you run? (e.g., AC, pool pump, hot tub, etc.)

Brief Assessment of Awareness Levels **10 minutes**

- Write "Flex Your Power Now!" on flipchart. Have color copy of logos if possible taped underneath
- How many have heard of this?
- What do you recall about it? (capture on flipchart)
- Probe on where/when saw ads, messages, alerts
- Probe on gist or purpose of the program (as relevant)

Campaign Discussion **60 minutes**

- NOTE: we will have a pair of 2006 ads (education vs. alert) and a pair of 2007 ads as well as one radio spot. We will counter-balance the order of 2006 and 2007 between cities

First Reactions

- We're going to watch 2 TV ads (will do one at a time – education first, then alert)

- Now that you've watched the first ad (NOTE: education ad), on the pad in front of you, jot down a number from 1-7 (1=not at all motivating and 7=highly motivating) and first 3 words or short phrase that came to mind
- Capture both on flipchart

Motivation/Benefits

- What was motivating about it? What was not? (capture on flipchart)
- How does this convince you to participate? What about the message convinced you to participate?

- What about the message were turn offs or at least less compelling?
- From your understanding, what are the benefits of participating and consequences of not?

Tonality Discussion

- Draw several lines on flipchart – one is a continuum for attention (did not get my attention, grabbed my attention)
- Other continua:
    - Not urgent/urgent
    - Hopeful/alarmist
    - Gentle/aggressive
    - Cold/warm
    - Request/threat
    - Cute/Serious

- Plot where this ***ad*** fell on each.
- Where is ***ideal*** on each. Where *should* the ad fall?

- In addition to the message itself, we also have to balance the emotions or feelings the ad prompts. What are the dimensions or continua we should care about to achieve the goal of getting people to participate?
- Should the endpoints be relabeled? Are there better endpoints to capture the emotions or tone you are trying to balance? If we rename the endpoints, is the "sweet spot" in a different place now?
- Where does "energy crunch" fall on the important dimensions? Is it a strong enough word to you to explain the situation? Is there a better word for this?
    - Additional probes:
    - Power plunge
    - Power surge

- watch alert version of the education spot just discussed
- Get first reactions – 3 words or phrase
- What was main message?
- How is this different from the one we just watched? Probe on:
    - Call to action
    - Education
    - Information, etc.
- On a 1-7 scale, how effective was the ad in conveying the alert? 1=not at all effective and 7=highly effective. Capture ratings.
- Explain your rating. What is good about it? What doesn't work about it? We are not here to change the creative, it's more about the idea that the ad/alert gets across.
- Is what they are asking in FYPN a short-run request or a longer-term request? Explain.
- What are better words for describing the type of request they are making (i.e., different words for "short term")?
- Where does the term "flex alert" fall on the relevant dimensions? Is it in the appropriate place? Better word?

Barriers

- One more scale to fill out – 1-7 where 1=a total imposition and 7=not at all an imposition – for you personally, evaluate how you feel about FYPN. Capture ratings on flipchart
- Have each explain their rating
- Why wouldn't you participate?
    - Possible additional probes to explain:
    - Doing all I can already
    - One person not able to make a difference
    - Not really home to do anything

- **Repeat all of the above for second pair of spots**

- One last spot – radio. Listen to this. Same discussion probes (if time) as TV education ads
    - Main idea
    - Motivating

FYPN Concept (shorten probes as needed based on ad discussion) 20 minutes

- Pass out handouts with description of the FYPN concept (read out loud to them, but then they will also have as a reference)
    - FYPN is a notification system designed to help manage summer peak-electricity demand. When electricity supply is tight, due to heat waves, high demand, unplanned outages, or transmission problems, we work with the California Independent System Operator and the state's major utilities to call a Flex Alert day, requesting all Californians to reduce electricity use to help prevent electrical emergencies.

- Let's start by making sure we have agreement on what the main idea of the program is?
- Probe on "peak" – specifically, what does this mean? Why is it relevant?
- What are your overall reactions to the program? – just get gut reactions first
- What is the benefit of the program? Who actually benefits? What, if anything, is in it for you?
    - If money and environment come up – which to lead with any why?
    - How link the two?

- Suppose you chose to participate after an alert – why would you do what they asked you to do? Why is doing what they request important? How do you feel about doing it?
- Why might you choose not to do what they ask? What would happen if you didn't?
- Briefly talk about each specific action included in the request. Probe on:
    - Turning off lights and appliances not actively in use
    - Thermostat set to 78 (be sure to probe on whether would be willing to increase thermostat by 2-3 degrees regardless of starting point)
    - Not use major appliances until 7PM or later
    - Get them to talk about degree of inconvenience, how easy to change habits
- Language concept insights (if time)
    - Write the following on flipchart:
    - Global warming
    - Power
    - Electricity
    - Energy
    - Conservation
    - Environment

- Write on pad in front of you the terms you think are most important to convey the primary message of adjusting behavior during alerts.
    - Capture one by one and have them explain

Timing/Media Discussion **10 minutes**

- Write on flipchart:
    - FYPN explanation message
    - FYPN alert
- We know the alerts are last minute – in your mind, what is the best way of getting you this notice that FYPN needs to kick in?
    - Leave open end and probe on why, where are they when they receive the message, are they in a position to comply with the requested actions where they are? Specifically probe on thermostat
    - Ask for specific reactions to: screen crawl on TV, email, billboard/highway signs, radio
    - Would you see the alert? Would you be in a position to act?
    - For email – probe on how feel about signing up for this and how spam-like it feels
- Talk briefly about best places to put the explanation message in front of you

Analogies (if time) **10 minutes**

- (as appropriate) We seem to be in agreement that FYPN is a one-shot deal or short term deal rather than a change your lifestyle request.
- Are there analogies in other behaviors that we can think of?
- One that someone raised earlier is "we're not trying to cure cancer, we're just trying to get a few people to stop smoking."
- Are there behaviors you can compare the FYPN concept to?
- (they may not be able to do this, but let's try)
- list the following on a flipchart:
    - recycling
    - fuel efficient car/hybrid car
    - CF light bulbs (compact fluorescent)
    - front-load washer
    - conservation habits
    - composting
    - reduced fat diet
- Which of these, if any, is the best "fit" on some level with FYPN?
- Why? Probe on how "fit" with one another? What ones don't apply and why?

7.1.2 Baseline Survey Instrument

Introduction

Hello, my name is _____ and I'm conducting a short survey sponsored by the California electric utilities. This is not a sales call. The questions that I have will only take about 10 minutes and your responses will be kept strictly confidential. [IF RESPONDENT ASKS, INDICATE THAT THIS SURVEY IS BEING CONDUCTED FOR THE CALIFORNIA INVESTOR-OWNED ELECTRIC AND GAS UTILITIES INCLUDING SCE, PG&E, SCG, SDG&E, WITH THE PARTICIPATION OF THE CALIFORNIA PUBLIC UTILITIES COMMISSION.]

O1. What is your electric utility?

1. Pacific Gas & Electric (PG&E)
2. Southern California Edison (SCE)
3. San Diego Gas & Electric (SDG&E
4. Other [THANK AND TERMINATE]

General Awareness of Energy Conservation

1. What efforts – such as programs or campaigns – are you aware of that are underway in California designed to conserve energy? [PROBE FOR SPECIFIC NAMES]
   OPEN END
   2. None
   -8 Do not know
   -9 Refused *[!]*

[SKIP Q2 IF Q1=2]

2. How did you first become aware of these efforts? [DO NOT READ, CHECK ALL THAT APPLY]
   1. Television advertising
   2. Radio advertising
   3. Flex Your Power Campaign
   4. Billboard
   5. In-store display
   6. Newspaper advertisement, unspecified
   7. Community agency, home or tradeshow
   8. Utility contact – mailing, customer representative
   9. Friend, family or colleague
   10. Other Specify _____
   -8. Do not know *[!]*
   -9 Refused *[!]*

Awareness of Flex Your Power and Flex Your Power NOW

3. How familiar are you with the phrase "Flex Your Power"? Would you say you are...
   1. Very familiar
   2. Somewhat familiar
   3. Slightly familiar
   4. Not at all familiar with the phrase "Flex Your Power"
   -8. Do not know

-9. Refused *[!]*

4. What do you think of when you hear the term "Flex Your Power"? [OPEN-ENDED, CHECK ALL THAT APPLY. NOTE THAT WE WILL ASK ALL RESPONDENTS THIS QUESTION, AND COMPARE THOSE WHO HAVE HEARD OF FYP VERSUS THOSE WHO HAVE NOT]
OPEN END
2. Never heard of the term
-8. Do not know
-9. Refused *[!]*

5. How familiar are you with the term "Flex Your Power NOW", which is the same phrase but with "NOW" on the end? Would you say you are...
1. Very familiar
2. Somewhat familiar
3. Slightly familiar
4. Not at all familiar with the term "Flex Your Power NOW"
-8. Do not know
-9. Refused *[!]*

6. What do you think of when you hear the term "Flex Your Power NOW"? [NOTE THAT WE WILL ASK ALL THIS QUESTION AND COMPARE THOSE WHO HAVE HEARD OF Flex Your Power NOW TO THOSE WHO HAVE NOT]
OPEN END
2. Never heard of the term
-8. Do not know
-9. Refused *[!]*

6a. How familiar are you with the term "Flex Alerts" Would you say you are...
1. Very familiar
2. Somewhat familiar
3. Slightly familiar
4. Not at all familiar with the term "Flex Your Power NOW"
-8. Do not know
-9. Refused *[!]*

6b. What do you think of when you hear the term "Flex Alert?
OPEN END
2. Never heard of the term
-8. Do not know
-9. Refused *[!]*

Flex Your Power

For the next set of questions – I would like to concentrate on the Flex Your Power advertising campaign.

7. Do you ever recall hearing or seeing a Flex Your Power advertisement?
1. Yes
2. No [SKIP TO Q11]
-8. Do not know [SKIP TO Q11]

-9. Refused [SKIP TO Q11] *[!]*

8. What do you recall learning from the message you saw or heard for Flex Your Power? [DO NOT READ*[!]*] [MULTIPLE RESPONSE]
   1. Conserve energy
   2. Buy or Install energy-efficient equipment
   3. Shut off electric consuming equipment
   4. Change thermostat settings
   5. Get an energy audit
   6. Avoid a brownout
   7. Other Specify _____
   -8. Do not know
   -9. Refused *[!]*

9. Have you done anything to change how much electricity you use or purchased lower energy use equipment as a result of the information you learned from Flex Your Power?
   1. Yes
   2. No
   -8. Do not know *[!]*
   -9. Refused *[!]*

[IF Q9=1]
10. What have you done?
   [OPEN ENDED]
   -8. Do not know *[!]*
   -9. Refused *[!]*

Flex Your Power—Now

Now I want to ask about the Flex Your Power NOW advertising campaign, which sometimes uses the phrase "Flex Alert."

11. Do you ever recall hearing or seeing a message or advertisement regarding Flex Your Power NOW?
   1. Yes
   2. No [SKIP TO Q19]
   -8. Do not know [SKIP TO Q19]
   -9. Refused [SKIP TO Q19] *[!]*

[Analysis note: Crosstab Question 5 with Question 11. Issue: If they answered "4. Not at all familiar with the term 'Flex Your Power NOW'" to Question 5 but Yes to Question 11, what is going on? Look at the answers to other questions for this group to check for consistency.]

[IF Q11=1]
12. Did you see or hear a Flex Your Power NOW advertisement... [READ RESPONSES] [MULTIPLE RESPONSE] *[!]*
   A. On television
   B. On the radio
   C. In the newspaper
   D. On a billboard, or
   E. Anywhere else? Specify: _____

Answer Categories
1. Yes
2. No
-8. Do not know
-9. Refused

[IF Q12C=1]
13. Do you remember what newspapers in which you saw the Flex Your Power NOW advertisement?
[OPEN ENDED]
-8 Do not know
-9. Refused *[!]*

[IF Q12B=1]
14. Can you tell me the radio station(s) on which you heard the Flex Your Power NOW advertisement?
[OPEN ENDED]
-8 Do not know
-9. Refused *[!]*

[IF Q12A=1]
15. Can you tell me the television station(s) on which you heard about Flex Your Power NOW?
[OPEN ENDED]
-8 Do not know
-9. Refused *[!]*

[IF Q12D=1]
[!] 16. Can you tell me where you saw the billboard?
[OPEN ENDED]
-8 Do not know
-9. Refused *[!]*

*[!]*17A. What do you recall learning from the message you saw or heard for Flex Your Power NOW ?
[DO NOT READ] [MULTIPLE RESPONSE]
1. Conserve energy
2. Conserve energy during the afternoon
3. Shut off unnecessary lights
4. Buy or install energy-efficient equipment
5. Shut off electric consuming equipment
6. Change thermostat settings
7. Avoid a brownout
8. Other Specify _____
-8. Do not know
-9. Refused

*[!]*17B. Have you done anything to change when you use electricity or how much you use as a result of the information you learned from Flex Your Power NOW ?
1. Yes
2. No
-8. Do not know
-9. Refused

[IF Q17B=1]

*[!]*17C. What have you done?
[OPEN ENDED]
-8. Do not know
-9. Refused

[IF Q11=1]
18a. What is the main message or idea associated with the Flex Your Power NOW advertisement you saw or heard? [DO NOT READ*[!]*] [MULTIPLE RESPONSE]
1. Turn thermostat down
2. Use fans to cool house
3. Use major appliances in early morning or at night
4. Shut off unnecessary appliances or electric equipment
5. Turn off unneeded lights
6. Pull window shades or curtains
7. Conserve energy, general
8. Other Specify _____
9. Conserve energy in the afternoon
-8. Do not know
-9. Refused *[!]*

[IF Q11=1]
18b. Are there any other messages associated with the Flex Your Power NOW advertisement you saw or heard?
[OPEN ENDED]
2. No
-8. Do not know
-9. Refused *[!]*

[Rationale for moving question 18a from before 18b to here: Questions 18b and 18c test for <u>unaided</u> recall of the advertisement message. Q18a asks about the alert, which may aid their recall. As a result, it should be asked after the unaided questions.]
18c. Flex Your Power NOW messages include suggestions for what to do when you hear a FLEX ALERT for Flex Your Power NOW. What suggestions, if any, do you remember hearing? [DO NOT READ*[!]*] [MULTIPLE RESPONSE]
1. Turn thermostat down
2. Use fans to cool house
3. Use major appliances in early morning or at night
4. Shut off unnecessary appliances or electric equipment
5. Turn off unneeded lights
6. Pull window shades or curtains
7. Conserve energy, general
8. Other Specify _____
9. Same answer I gave above (to Question 18b) *[!]*
10. Conserve energy in the afternoon
-8. Do not know
-9. Refused *[!]*

[IF Q11=1]
18d. Was there anything confusing or difficult to understand about the Flex Your Power NOW or FLEX ALERT advertisement you saw or heard?
[OPEN ENDED]

2. No
-8 Do not know
-9. Refused *[!]*

While Flex your Power is a year round campaign, encouraging customers to conserve energy, the Flex Your Power **Now** advertisements tell you that when you hear a "FLEX Alert" energy needs are high and electricity supplies are low and that you should take immediate energy conservation actions if you can.

19. Have you seen or heard an alert message telling you that you should take energy conservation actions that day or the next day?

1. Yes
2. No [SKIP TO Q23]
-8. Do not know [SKIP TO Q23]
-9. Refused [SKIP TO Q23] *[!]*

[IF Q19=1]
*[!]*19A. Approximately how many of those "flex alert" messages would you say you have seen in the last year?
[NUMERIC RESPONSE]
-8. Do not know
-9. Refused *[!]*

[IF Q19=1]
*[!]*21B. Did the alert messages tell you to conserve energy that day or the following day?
1. That day
2. The following day
3. Some of both
4. Other Specify _____
-8. Do not know
-9. Refused

[IF Q19=1]
*[!]*19C. Did the alert messages tell you to conserve energy all day or during a particular time of day?
1. All day
2. A particular time of day
-8. Do not know
-9. Refused

[IF Q19C=2]
*[!]*19D. What time of day did the message tell you to conserve?
1. Morning
2. Afternoon
3. Evening
4. Night
5. Other Specify _____
-8. Do not know
-9. Refused

[IF Q19=1]

20. Where did you see or hear this alert/these alerts? [DO NOT READ, PROMPT IF NECESSARY, MULTIPLE RESPONSE]
    1. Television
    2. Radio
    3. Newspaper
    4. Email
    5. Other Specify _____
    -8. Do not know *[!]*
    -9. Refused *[!]*

[IF Q19=1]

21. After hearing the alert(s), did you turn off any equipment that uses electricity or do anything different to change how you used electricity that day?
    1. Yes
    2. No
    3. Sometimes [ONLY APPLICABLE IF THEY HEARD MORE THAN ONE ALERT]
    -8. Do not know
    -9. Refused *[!]*

[IF Q21=1 OR 3]

22. What did you do? [IF RESPONDENT SAYS THEY TURNED OFF APPLIANCES, PROBE FOR WHICH APPLIANCES] [DO NOT READ*[!]*] [MULTIPLE RESPONSE]
    1. Turn thermostat down
    2. Use fans to cool house
    3. Use major appliances in early morning or at night
    4. Shut off unnecessary appliances or electric equipment
    5. Turn off unneeded lights
    6. Pull window shades or curtains
    7. Conserve energy, general
    8. Other Specify _____
    9. Conserve energy in the afternoon
    -8. Do not know *[!]*
    -9. Refused *[!]*

*[!]*22A. [IF Q21=2] Why not?
[IF Q21=3] Why did you not take any action for some of the alerts?
[OPEN ENDED]
-8. Do not know
-9. Refused

*[!]*22B. What kinds of information should Flex Your Power Now provide to help you respond to the alerts?
[OPEN ENDED]
-8. Do not know
-9. Refused

23. On a day when the supply of electricity is limited, there are several ways to inform you about energy conservation and the need to save power. Which of the following would be the most effective way to inform you of the immediate need to reduce your energy usage for **that** day? [READ ALL, CHOOSE ONE]
    1. Newspaper advertisement

2. Radio announcement
3. Television announcement
4. Highway message announcement
5. An email message that goes directly to your inbox
6. Tell me the night before
7. Text message on my cell phone
6. Any other way? Specify _____
-8. Do not know *[!]*
-9. Refused *[!]*

[IF Q23 IS NOT 5]
[!]24. If the program offered an e-mail alert to notify you that you should conserve energy that day or the next day, would you be willing to share your email address?
1. Yes
2. No
3. Do not have an email address
-8. Do not know
-9. Refused

25a. Who do you think sponsors the Flex Your Power NOW program? [READ ALL, CHOOSE ONE]
1. California or state government
2. Electric utility (PG&E, SCE, SDG&E)
3. Federal government
4. Other Specify _____
-8. Do not know *[!]*
-9. Refused *[!]*

25b. Which entity has the most credibility to issue alerts to customers to conserve energy? [READ RESPONSES, CHOOSE ONLY ONE]
1. California or state government
2. Electric utility (PG&E, SCE, SDG&E)
3. Federal government
4. Local television or radio newscast
5. None of the above
6. Other? Specify_____
-8. Do not know *[!]*
-9. Refused *[!]*

Awareness and Familiarity with Other Issues

26. Have you ever visited the Flex Your Power Web site at fypower.org?
1. Yes
2. No
-8. Do not know
-9. Refused *[!]*

27. Please tell me if you are very familiar, somewhat familiar, slightly familiar, or not at all familiar with the following terms:
A. ENERGY STAR.
B. The Energy Hog.
C. "Spare the Air" [ASK ONLY OF PG&E CUSTOMERS]

D. Utility-sponsored energy efficiency programs.
E. The 20/20 energy conservation program
F. "For 100 Years....Life, Powered by Edison" [ASK ONLY OF SCE CUSTOMERS]

Would you say you are...
1. Very familiar
2. Somewhat familiar
3. Slightly familiar
4. Not at all familiar
-8. Do not know
-9. Refused *[!]*

28. Did Flex Your Power or Flex Your Power Now help you become aware of these other energy conservation programs?
1. Yes
2. No
-8. Do not know
-9. Refused *[!]*

Communications Issues *[!]*

Now I want to ask you some questions about your TV, radio, and internet habits.

C1. Do you listen to the radio?
1. Yes (or sometimes or rarely)
2. No
-8. Do not know *[!]*
-9. Refused *[!]*

[IF C1=1]
C2. What times of day do you usually listen to the radio on weekdays? Do you listen…
C2A. In the morning before leaving the house?
C2B. In the car?
C2C. During the middle of the day?
C2D. In the evening?
Answer Categories
1. Rarely (or never)
2. Sometimes
3. Often
-8. Do not know
-9. Refused

C3. On weekdays, do you watch television…
C3A. In the morning before leaving the house?
C3B. During the middle of the day?
C3C. In the evening?
Answer Categories
1. Rarely (or never)
2. Sometimes
3. Often

-8. Do not know
-9. Refused

C4. How often do you read a daily newspaper? Would you say you read one … [READ ALL, CHOOSE ONE]
1. Every day
2. A few days a week
3. Once a week
4. Less often
5. Rarely or never
-8. Do not know
-9. Refused

C5. How often do you use the internet or check email? Would you say that you use the internet… [READ ALL, CHOOSE ONE]
1. Every day
2. A few days a week
3. Once a week
4. Less often
5. Rarely or never
-8. Do not know
-9. Refused

Demographics

D1. Do you have any of the following in your home? [READ ALL]
A. Central Air Conditioning
B. A heated pool
C. A washing machine
D. A dishwasher
E. Personal Computer
F. A second refrigerator
G. A standalone freezer

Answer Categories:
1. Yes
2. No
-8. Do not know *[!]*
-9. Refused *[!]*

[IF D1A=1]
*[!]*D1AA. Is your central air conditioner typically running in the afternoon on work days in the summer?
1. Yes
2. No
-8. Do not know
-9. Refused

[IF D1B=1]
*[!]*D1BB. Is your pool pump typically running in the afternoon on work days in the summer?
1. Yes
2. No
-8. Do not know

-9. Refused

[IF D1E=1]
*[!]*D1EE. Is your home computer typically on in the afternoon on work days in the summer?
1. Yes
2. No
-8. Do not know
-9. Refused

[IF D1C=1]
*[!]*D1CC. How many times a week do you typically wash a load of laundry in the afternoon on work days in the summer?
0 to 7, -8, -9 Allowable answers
-8. Do not know
-9. Refused

[IF D1D=1]
*[!]*D1DD. How many times a week do you typically run the dishwasher in the afternoon on work days in the summer?
0 to 7, -8, -9 Allowable answers
-8. Do not know
-9. Refused

D2. Are you the person who pays or reviews the electric bills for your home? [IF NO, PROBE WHETHER SOMEONE ELSE PAYS THE BILLS OR IF THEY DO NOT RECEIVE ONE.]
1. Yes
2. No, someone else in household pays bill
3. No, we do not receive the electricity bill
-8. Do not know
-9. Refused *[!]*

D3. What is your ethnicity or race?
1. White
2. Asian
3. Black or African American
4. Hispanic or Latino
5. American Indian or Alaska Native
6. Native Hawaiian or Other Pacific Islander
7. Russian
8. Other
-8. Do not know
-9. Refused

D4. What type of residence do you live in? [READ CATEGORIES]
1. Single-family
2. Duplex or two-family
3. Triple-decker
4. Apartment or condo in a building with 2 to 4 units
5. Apartment or condo in a building with more than 4 units
6. Townhouse or row house (with walls that are shared with another house)
7. Mobile home or house trailer

8. Other Specify _____
-8. Do not know
-9. Refused

D5. Do you (or someone else in your household) own or rent your home or apartment?
1. Own
2. Rent
-8. Do not know
-9. Refused

[IF D5=2]
D6. Does someone in your household pay your electricity bill or is it included in your rent?
1. Yes, someone in household pays electricity bill
2. No, no one pays bill because bill is included in rent
3. Other Specify _____
-8. Do not know
-9. Refused *[!]*

D7. Approximately how old is your home or apartment? [READ CATEGORIES, IF NECESSARY]
1. 0-4 years old
2. 5-10 years old
3. 11-15 years old
4. 16-20 years old
5. 21-40 years old
6. 41-80 years old
7. 81 or more years old
-8. Do not know
-9. Refused

D8. What is the highest level of education that you have completed so far? [READ CATEGORIES, IF NECESSARY]
1. Less than high school graduate
2. High school graduate
3. Technical or trade school graduate
4. Some college
5. College graduate
6. Some graduate school
7. Graduate degree
-8. Do not know
-9. Refused

D9. Counting yourself, how many people in your household fit into the following age groups?
D8a. 0 – 17 years old
D8b. 18-64 years old
D8c. 65 or over
Answer Categories:
0 to 10, -8, -9 Allowable answers
-8. Do not know *[!]*
-9. Refused

D10. Is anyone in your household at home during a typical weekday afternoon?

1. Yes
2. No
-8. Do not know
-9. Refused

D11. Approximately what do you pay in electricity-only bills per month? [NOTE: rough estimate is fine.]

Answer Categories:

0 to 1000, -6 through -9 Allowable answers
-6. Do not have electricity
-7. Do not pay electricity
-8. Do not know
-9. Refused *[!]*

D12. Now, approximately what do you pay in gas bills per month? [NOTE: rough estimate is fine.]

Answer Categories:

0 to 1000, -6 through -9 Allowable answers
-6. Do not have gas
-7. Do not pay gas
-8. Do not know
-9. Refused *[!]*

D13. [OBSERVED] Gender:

1. Male
2. Female

Psychographics

E1. I'm going to read you a series of statements and ask you to strongly agree, agree, disagree, or strongly disagree.

E1a. I frequently recycle.

E1b. I participate in community meetings and organizations regularly.

E1c. I participate in environmental causes.

E1d. Global warming is an important environmental issue.

E1e. The choices that I make regarding electricity usage can make a difference in greenhouse gas emissions.

E1f. Comfort is more important to me than saving energy in my home.

E1g. I should do my part to help fellow Californians.

E1h. What I do only makes a difference if others do it too.

Answer Categories:

1. Strongly agree
2. Agree

3. Disagree
4. Strongly disagree
-8. Do not know
-9. Refused *[!]*

That is all the questions I have today. Thank you for participating in our survey effort. Your help is greatly appreciated.

7.1.3 Post-Event Survey Instrument

On behalf of your electric utility, we are calling to ask some questions about actions you may have taken and advertisements you may have heard during the recent heat wave. Do you have a few minutes?

Q1. During the last four days, did you change anything about how you normally use electricity?

1. Yes
2. No (SKIP TO Q3)
3. Don't Know (SKIP TO Q3)
4. Refused (SKIP TO Q3)

Q2. Please describe what you did. [DO NOT READ LIST, RECORD ALL THAT APPLY]

1. Turn off unneeded lights
2. Set thermostat to 78 degrees or higher
3. Use appliances after 7 PM
4. Don't use appliances
5. Went to a public area that provides AC (e.g. mall, coffee shop)
6. Went out and took advantage of free public transportation (Spare the Air Day)
7. Other (Please specify: _____)
8. Nothing
9. Don't know
10. Refused

Q3. Do you remember hearing or seeing any advertisements, announcements, emails, or other public notices about conserving electricity during the past four days?

1. Yes
2. No (SKIP TO Q8)
3. Don't Know (SKIP TO Q8)
4. Refused (SKIP TO Q8)

Q4. Where did you see or hear this advertisement? [DO NOT READ LIST, RECORD ALL THAT APPLY]

1. Television – commercial
2. Television – news or interviews
3. Radio – commercial
4. Radio – news or interviews
5. Newspaper
6. Billboard
7. Freeway message board *("Amber Alert" sign)*
8. Flex Your Power website (fyp.org)
9. Utility website (SCE, SDG&E, PG&E)
10. Other website (please specify:_____)
11. Magazine or business journal
12. Electric utility representative
13. Emails
14. Text messages on cell phone
15. Other (record verbatim) _____
16. Don't know
17. Refused

Q5. Can you tell me what the ad or announcement asked you to do? [DO NOT READ LIST, RECORD ALL THAT APPLY]

1. Turn off unneeded lights
2. Set thermostat to 78 degrees or higher
3. Use appliances after 7 PM
4. Don't use appliances
5. Other (Please specify: _____)
6. Don't know
7. Refused

Q6. When did the ad or announcement tell you to conserve electricity? Did it tell you to conserve... [READ ALL, RECORD ALL THAT APPLY]

1. Over the long-term?
2. Seasonally?
3. On a particular day?
4. At a particular time of day?
5. Other (Please specify _____)
6. Don't know
7. Refused

Q7. Did the ad or announcement that you saw mention a specific alert program? Did the ad mention… [READ LIST, ROTATE LIST, RECORD RESPONSES]

1. No specific program
2. Emergency Alert
3. Flex Alert
4. Crisis Alert
5. Flex Your Power NOW!
6. Power Watch Day
7. Flex Your Power
8. Other (please specify: _____)
9. Don't Know
10. Refused

Q8. Do you remember an advertisement <u>on TV</u> during the past four days with written words on a red background and a voiceover announcing that state officials had called a "Flex Alert"? [IF YES, CLARIFY WHETHER THIS IS THE SAME AD THEY'VE BEEN DESCRIBING OR A DIFFERENT ONE]

1. Yes, that is the ad I've been describing [SKIP TO Q11]
2. Yes, but this is a different ad than what I've been describing [CONTINUE TO Q9]
3. No [SKIP TO Q11]
4. Don't Know [SKIP TO Q11]
5. Refused [SKIP TO Q11]

Q9. Do you recall what the ad or Flex Alert told you to do? [DO NOT READ LIST, RECORD ALL THAT APPLY]

1. Turn off unneeded lights
2. Set thermostat to 78 degrees or higher
3. Use appliances after 7 PM
4. Don't use appliances
5. Other (Please specify: _____)
6. Don't know
7. Refused

Q10. When did the Flex Alert tell you to conserve electricity? Did it tell you to conserve... [READ ALL, RECORD ALL THAT APPLY]

1. Over the long-term?
2. Seasonally?
3. On a particular day?
4. At a particular time of day?
5. Other (Please specify _____)
6. Don't know
7. Refused

Q11. Please describe the actions you took in response to the alert that you saw. [DO NOT READ LIST, RECORD ALL THAT APPLY]

1. Turn off unneeded lights
2. Set thermostat to 78 degrees or higher
3. Use appliances after 7 PM
4. Don't use appliances
5. Other (Please specify: _____)
6. Did not take any actions in response to the Flex Alert
7. Don't know
8. Refused

[IF Q11=6, continue to Q12. If Q11 ≠ 6, skip to Q13 at end.]

Q12. [IF Q11=6] Why did you not take any actions in response to the Flex Alert?

[OPEN ENDED]

1. Don't know
2. Refused

Q13. Tell me how strongly you agree with the following statements. 1 Strongly Disagree, 2 Somewhat Disagree 3 Neutral 4 Agree Somewhat 5 Strongly Agree

1.Global Warming is a problem.

2.Conserving electricity today can stop or slow global warming in the future.

3. I believe it is everyone's responsibility to conserve now to reduce global warming in the future

Those are all the questions I have for you today. Thank you for taking the time to help us.

7.1.4 Post-Summer Survey Instrument

Introduction

Hello, my name is _____ and I'm conducting a short survey sponsored by a California-based organization. This is not a sales call. The questions that I have will only take about 10 minutes and your responses will be kept strictly confidential. [IF RESPONDENT ASKS, INDICATE THAT THIS SURVEY IS BEING CONDUCTED FOR A VARIETY OF UTILITY-RELATED ORGANIZATIONS.]

O1. What is your electric utility?

1. Pacific Gas & Electric (PG&E)
2. Southern California Edison (SCE)
3. San Diego Gas & Electric (SDG&E
4. Other [THANK AND TERMINATE]

General Awareness of Energy Conservation

1. Can you recall the names of any specific programs or campaigns that are underway in California designed to conserve energy? [PROBE FOR SPECIFIC NAMES]
   OPEN END

2. None [SKIP TO Q3]
-8 Do not know
-9 Refused

[SKIP Q2 IF Q1=2]
2. How did you first become aware of these efforts? [DO NOT READ, CHECK ALL THAT APPLY]
1. Television advertising
2. Radio advertising
3. Flex Your Power Campaign
4. Billboard
5. In-store display
6. Newspaper advertisement, unspecified
7. Community agency, home or tradeshow
8. Utility contact – mailing, customer representative
9. Friend, family or colleague
10. Other Specify _____
-8. Do not know
-9 Refused

Awareness of Flex Your Power and Flex Alerts

3. How familiar are you with the phrase "Flex Your Power"? Would you say you are...
1. Very familiar
2. Somewhat familiar
3. Slightly familiar
4. Not at all familiar with the phrase "Flex Your Power"
-8. Do not know
-9. Refused

4. What do you know about "Flex Your Power"?
OPEN END
2. Nothing
-8. Do not know
-9. Refused

5. How familiar are you with the term "Flex Your Power NOW", which is the same phrase but with "NOW" on the end? Would you say you are...
1. Very familiar
2. Somewhat familiar
3. Slightly familiar
4. Not at all familiar with the term "Flex Your Power NOW"
-8. Do not know
-9. Refused

6. What do you know about "Flex Your Power NOW"?
OPEN END
2. Nothing
-8. Do not know
-9. Refused

7. How familiar are you with the term "Flex Alerts"? Would you say you are...
   1. Very familiar
   2. Somewhat familiar
   3. Slightly familiar
   4. Not at all familiar with the term "Flex Alerts"
   -8. Do not know
   -9. Refused

8. What do you know about "Flex Alerts"?
   OPEN END
   2. Nothing
   -8. Do not know
   -9. Refused

Flex Your Power

For the next set of questions – I would like to concentrate on the Flex Your Power advertising campaign.

9. Do you ever recall hearing or seeing a Flex Your Power advertisement?
   1. Yes
   2. No [SKIP TO Q12]
   -8. Do not know [SKIP TO Q12]
   -9. Refused [SKIP TO Q12]

10. What do you recall learning from the message you saw or heard for Flex Your Power? [DO NOT READ] [MULTIPLE RESPONSE]
   1. Conserve energy
   2. Buy or install energy-efficient equipment (CFLs, appliances, A/C unit, etc.)
   3. Shut off electric consuming equipment (lights, A/C, appliances, etc.)
   4. Change thermostat settings
   5. Get an energy audit
   6. Avoid a brownout
   7. Other Specify _____
   -8. Do not know
   -9. Refused

11. What things have you done, if anything, in response to the Flex Your Power ad you saw? [DO NOT READ] [MULTIPLE RESPONSE]
   1. Buy or install energy-efficient equipment (CFLs, appliances, A/C unit, etc.)
   2. Shut off electric consuming equipment (lights, A/C, appliances, etc.)
   3. Change thermostat settings
   4. Get an energy audit
   5. Avoid a brownout
   6. Other Specify _____
   -8. Do not know
   -9. Refused

Flex Alerts

For the next set of questions, we are focusing on the Flex Alert campaign.

12. Have you seen or heard a "Flex Alert" advertisement or message?
    1. Yes [SKIP to 14]
    2. No [CONTINUE TO Q13]
    -8. Do not know [SKIP TO Q30]
    -9. Refused [SKIP TO Q30]

13. Have you seen or heard an alert message telling you that you should take energy conservation actions that day or the next day?

    1. Yes [CONTINUE TO Q14]
    2. No [SKIP TO Q30]
    -8. Do not know [SKIP TO Q30]
    -9. Refused [SKIP TO Q30]

[IF Q12 or Q13=1]

14. Approximately how many of those "Flex Alert" messages would you say you have seen in the last year?
    [NUMERIC RESPONSE]
    -8. Do not know
    -9. Refused

15. Where did you see the Flex Alert? Did you see or hear a Flex Alert message... [READ RESPONSES]
    [MULTIPLE RESPONSE]
    A. On television
    B. On the radio
    C. In the newspaper
    D. On a website
    E. In an email, or
    F. Anywhere else? Specify: _____

Answer Categories
    1. Yes
    2. No
    -8. Do not know
    -9. Refused

[IF Q15A=1]

16. Can you tell me the television station(s) on which you heard the Flex Alert message?
    [OPEN ENDED]
    -8 Do not know
    -9. Refused

[IF Q15B=1]

17. Can you tell me the radio station(s) on which you heard the Flex Alert message?
    [OPEN ENDED]
    -8 Do not know
    -9. Refused

[IF Q15C=1]
18. Can you tell me the newspapers in which you saw the Flex Alert message?
[OPEN ENDED]
-8 Do not know
-9. Refused

[IF Q15D=1]
19. Can you tell me on which website you saw the Flex Alert advertisement?
[OPEN ENDED]
-8 Do not know
-9. Refused

20. What do you recall learning from the Flex Alert message you saw or heard? [DO NOT READ]
[MULTIPLE RESPONSE]
1. Conserve energy
2. Conserve energy during the afternoon
3. Shut off unnecessary lights
4. Buy or install energy-efficient equipment
5. Shut off electric consuming equipment
6. Change thermostat settings
7. Avoid a brownout
8. Other Specify _____
-8. Do not know
-9. Refused

21. Flex Alert messages include suggestions for what to do when temperatures are high and energy conservation is needed. What suggestions, if any, do you remember hearing? [DO NOT READ]
[MULTIPLE RESPONSE]
1. Turn thermostat down
2. Use fans to cool house
3. Use major appliances in early morning or at night
4. Shut off unnecessary appliances or electric equipment
5. Turn off unneeded lights
6. Pull window shades or curtains
7. Conserve energy, general
8. Other Specify _____
9. Conserve energy in the afternoon
-8. Do not know
-9. Refused

22. Did the alert messages tell you to conserve energy that day or the following day?
1. That day
2. The following day
3. Some of both
4. Other Specify _____
-8. Do not know
-9. Refused

23. Did the alert messages tell you to conserve energy all day or during a particular time of day?
1. All day [SKIP TO Q25]
2. A particular time of day [CONTINUE TO Q24]
-8. Do not know [SKIP TO Q25]
-9. Refused [SKIP TO Q25]

[IF Q23=2]
24. What time of day did the message tell you to conserve?
1. Morning
2. Afternoon
3. Evening
4. Night
5. Other Specify _____
-8. Do not know
-9. Refused

25. After hearing the alert(s), did you turn off any equipment that uses electricity or do anything different to change how you used electricity that day?
1. Yes [SKIP TO Q27]
2. No [CONTINUE TO Q26a]
3. Sometimes [ONLY APPLICABLE IF THEY HEARD MORE THAN ONE ALERT] [SKIP TO Q26b]
-8. Do not know [CONTINUE TO Q26]
-9. Refused [CONTINUE TO Q26]

26a. [IF Q25=2] Why not?
[OPEN ENDED] [SKIP TO Q30]
-8. Do not know
-9. Refused

26b. [IF Q25=3] Why did you not take any action for some of the alerts?
[OPEN ENDED] [CONTINUE TO Q27]
-8. Do not know
-9. Refused

[IF Q25=1 OR 3]
27. What did you do? [IF RESPONDENT SAYS THEY TURNED OFF APPLIANCES, PROBE FOR WHICH APPLIANCES] [DO NOT READ] [MULTIPLE RESPONSE]
1. Turn off unneeded lights
2. Set thermostat to 78 degrees or higher
3. Use appliances after 7 PM/avoid using appliances during afternoon
4. Don't use appliances
5. Conserve energy in the afternoon
6. Other Specify _____
-8. Do not know
-9. Refused

28. When did you take that action? [DO NOT READ]
1. The day of the alert (no time specified)
2. The day of the alert (in the afternoon)

3. On hot days
4. Every day
-8. Do not know
-9. Refused

29. After seeing the last Flex Alert, have you continued to [action from Q27]?
1. Yes
2. No
-8. Do not know
-9. Refused

30. On a day when the supply of electricity is limited, there are several ways to inform you about energy conservation and the need to save power. Which of the following would be the most effective way to inform you of the immediate need to reduce your energy usage for **that** day? [READ ALL, CHOOSE ONE]
1. Newspaper advertisement
2. Radio announcement
3. Television announcement
4. Highway message announcement
5. An email message that goes directly to your inbox
6. Tell me the night before
7. Text message on my cell phone
6. Any other way? Specify _____
-8. Do not know
-9. Refused

[IF Q30 IS NOT 5]
31. If the program offered an e-mail alert to notify you that you should conserve energy that day or the next day, would you be willing to share your email address?
1. Yes
2. No
3. Do not have an email address
-8. Do not know
-9. Refused

32. Who do you think sponsors the Flex Your Power NOW program? [READ ALL, CHOOSE ONE]
1. California or state government
2. Electric utility (PG&E, SCE, SDG&E)
3. Federal government
4. Other Specify _____
-8. Do not know
-9. Refused

33. Which entity has the most credibility to issue alerts to customers to conserve energy? [READ RESPONSES, CHOOSE ONLY ONE]
    1. California or state government
    2. Electric utility (PG&E, SCE, SDG&E)
    3. Federal government
    4. Local television or radio newscast
    5. None of the above
    6. Other? Specify_____
    -8. Do not know
    -9. Refused

Awareness and Familiarity with Other Issues

34. Have you ever visited the Flex Your Power Web site at fypower.org?
    1. Yes
    2. No
    -8. Do not know
    -9. Refused

35. Please tell me if you are very familiar, somewhat familiar, slightly familiar, or not at all familiar with the following terms:
    A. ENERGY STAR.
    B. The Energy Hog.
    C. "Spare the Air" [ASK ONLY OF PG&E CUSTOMERS]
    D. Utility-sponsored energy efficiency programs.
    E. The 20/20 energy conservation program
    F. "For 100 Years....Life, Powered by Edison" [ASK ONLY OF SCE CUSTOMERS]

Would you say you are...
    1. Very familiar
    2. Somewhat familiar
    3. Slightly familiar
    4. Not at all familiar
    -8. Do not know
    -9. Refused

36. Did Flex Your Power or Flex Your Power Now help you become aware of these other energy conservation programs?
    1. Yes
    2. No
    -8. Do not know
    -9. Refused

Demographics

D1. Do you have any of the following in your home? [READ ALL]
- A. Central Air Conditioning
- B. A heated pool
- C. A washing machine
- D. A dishwasher
- E. Personal Computer
- F. A second refrigerator
- G. A standalone freezer

Answer Categories:
1. Yes
2. No
-8. Do not know
-9. Refused

[IF D1A=1]
D1AA. Is your central air conditioner typically running in the afternoon on work days in the summer?
1. Yes
2. No
-8. Do not know
-9. Refused

[IF D1B=1]
D1BB. Is your pool pump typically running in the afternoon on work days in the summer?
1. Yes
2. No
-8. Do not know
-9. Refused

[IF D1C=1]
D1CC. How many times a week do you typically wash a load of laundry in the afternoon on work days in the summer?

0 to 7, -8, -9 Allowable answers
-8. Do not know
-9. Refused

[IF D1D=1]
D1DD. How many times a week do you typically run the dishwasher in the afternoon on work days in the summer?

0 to 7, -8, -9 Allowable answers
-8. Do not know
-9. Refused

[IF D1E=1]
D1EE. Is your home computer typically on in the afternoon on work days in the summer?
1. Yes
2. No
-8. Do not know
-9. Refused

D2. Are you the person who pays or reviews the electric bills for your home? [IF NO, PROBE WHETHER SOMEONE ELSE PAYS THE BILLS OR IF THEY DO NOT RECEIVE ONE.]
1. Yes
2. No, someone else in household pays bill
3. No, we do not receive the electricity bill
-8. Do not know
-9. Refused

D3. What is your ethnicity or race?
1. White
2. Asian
3. Black or African American
4. Hispanic or Latino
5. American Indian or Alaska Native
6. Native Hawaiian or Other Pacific Islander
7. Russian
8. Other
-8. Do not know
-9. Refused

D4. What type of residence do you live in? [READ CATEGORIES]
1. Single-family
2. Duplex or two-family
3. Triple-decker
4. Apartment or condo in a building with 2 to 4 units
5. Apartment or condo in a building with more than 4 units
6. Townhouse or row house (with walls that are shared with another house)
7. Mobile home or house trailer
8. Other Specify _____
-8. Do not know
-9. Refused

D5. Do you (or someone else in your household) own or rent your home or apartment?
1. Own
2. Rent
-8. Do not know
-9. Refused

[IF D5=2]
D6. Does someone in your household pay your electricity bill or is it included in your rent?
1. Yes, someone in household pays electricity bill
2. No, no one pays bill because bill is included in rent
3. Other Specify _____
-8. Do not know
-9. Refused

D7. What is the highest level of education that you have completed so far? [READ CATEGORIES, IF NECESSARY]

1. Less than high school graduate
2. High school graduate
3. Technical or trade school graduate
4. Some college
5. College graduate
6. Some graduate school
7. Graduate degree

-8. Do not know
-9. Refused

D8. Counting yourself, how many people in your household fit into the following age groups?

D8a. 0 – 17 years old
D8b. 18-64 years old
D8c. 65 or over

Answer Categories:

0 to 10, -8, -9 Allowable answers
-8. Do not know
-9. Refused

D9. Is anyone in your household at home during a typical weekday afternoon?

1. Yes
2. No

-8. Do not know
-9. Refused

D10. Approximately what do you pay in electricity-only bills per month? [NOTE: rough estimate is fine.]

Answer Categories:

0 to 1000, -6 through -9 Allowable answers
-6. Do not have electricity
-7. Do not pay electricity
-8. Do not know
-9. Refused

D11. Now, approximately what do you pay in gas bills per month? [NOTE: rough estimate is fine.]

Answer Categories:

0 to 1000, -6 through -9 Allowable answers
-6. Do not have gas
-7. Do not pay gas
-8. Do not know
-9. Refused

D12. [OBSERVED] Gender:

1. Male
2. Female

Psychographics

E1. I'm going to read you a series of statements and ask you to strongly agree, agree, disagree, or strongly disagree.

E1a. I frequently recycle.

E1b. I regularly attend community events, meetings, services, or other organized community events.

E1c. I participate in environmental causes.

E1d. Global warming is an important environmental issue.

E1e. The choices that I make regarding electricity usage can make a difference in greenhouse gas emissions.

E1f. Comfort is more important to me than saving energy in my home.

E1g. I should do my part to help fellow Californians.

E1h. What I do only makes a difference if others do it too.

Answer Categories:
1. Strongly agree
2. Agree
3. Disagree
4. Strongly disagree
-8. Do not know
-9. Refused

That is all the questions I have today. Thank you for participating in our survey effort. Your help is greatly appreciated.

7.2 Flex Alert Email Notifications

7.2.1 July 2007 Flex Alert Email

From: Flex Your Power [mailto:flexalert@fypower.org]
Sent: Tuesday, July 03, 2007 5:59 PM
To: Patricia Thompson
Subject: OFFICIAL FLEX ALERT – SAVE ELECTRICITY JULY 5TH 2007

The California Independent System Operator (CAISO), charged with managing the electricity grid in California, has issued a Flex Alert for Thursday, July 5th, 2007 from 7:00 AM to 7:00 PM.

Due to the current hot weather, the demand for electricity is approaching capacity. As a result, state officials have called a Flex Alert. It's urgent that you:

* Turn off all unnecessary lights

* If you must use an air conditioner, turn it up to 78 degrees or higher
* Postpone using major appliances until after 7 PM

For updates, please visit http://www.FlexYourPower.org/flexalert/

And thanks for flexing your power.

You can instantly unsubscribe from these emails by clicking the link below:
http://flexalerts.cmail1.com/.aspx/u/209645/bzoilj/

7.2.2 August 2007 Flex Alert Email

From: Flex Your Power [mailto:flexalert@fypower.org]
Sent: Tuesday, August 28, 2007 3:56 PM
To: Patricia Thompson
Subject: Official Flex Alert - Save Electricity August 29th & 30th 2007

The California Independent System Operator (CAISO), charged with managing the electricity grid in California, has issued a Flex Alert for both Wednesday, August 29th and Thursday, August 30th.

Due to the current hot weather, the demand for electricity is approaching capacity. As a result, state officials have called a Flex Alert. It's urgent that you:

- Turn off all unnecessary lights
- If you must use an air conditioner, turn it up to 78 degrees or higher
- Postpone using major appliances until after 7:00 PM

For updates, please visit www.FlexYourPower.org. We ask that you pass this e-mail along to your colleagues.

And thanks for Flexing Your Power.

- Flex Your Power

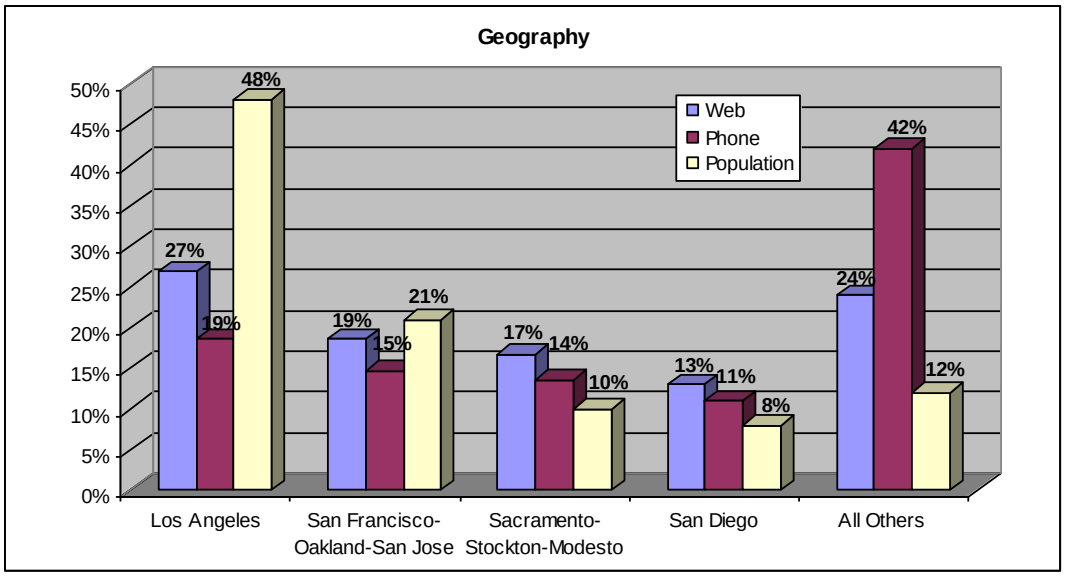
You can instantly unsubscribe from these emails by clicking the link below:
http://flexalerts.cmail5.com/u/236257/bzoilj/

7.3 Baseline Survey Respondent Demographics

Geography

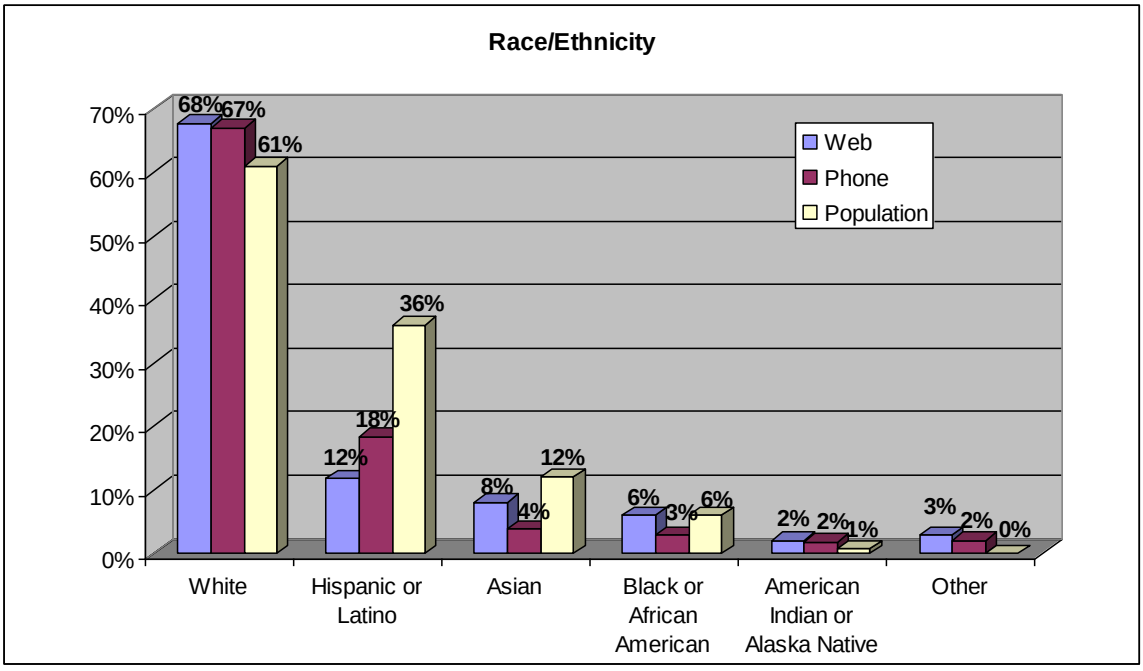
Three-quarters (75%) of the web survey respondents and 58% of the telephone respondents live in the four largest designated market areas (DMAs) in California. When compared to California's population, 87% of all Californians live in the four largest DMAs, so the web survey results better correspond to the actual population, but this is not a flaw in the telephone survey sample. By design, the sample for the telephone survey oversampled the smaller designated market areas (DMAs) in order to obtain more statistically valid results for *each* DMA; however, this was not possible for the web survey due to panel size limitations. Because the four largest DMAs received the majority of the funding for the Flex Your Power NOW! media purchases, we have tabulated the results in the preceding sections by DMA size

(larger vs. smaller DMAs) to more accurately represent the California population as a whole and to allow a more direct comparison between the web and phone results.



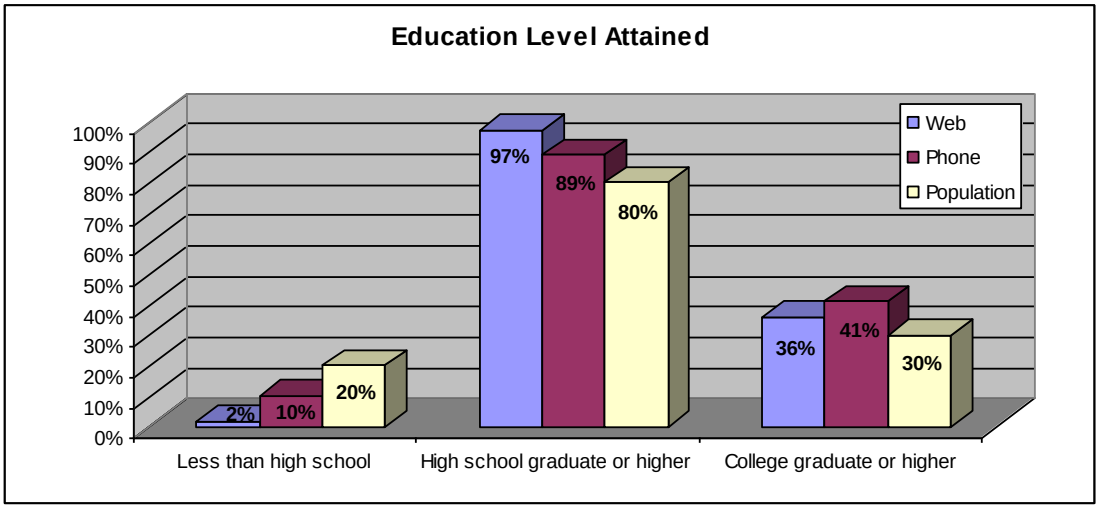
Race/Ethnicity

In terms of race/ethnicity, the telephone survey reached more Hispanics, who make up 36% of the California population as a whole. Eighteen percent of telephone survey respondents were Hispanic, compared to 12% of web survey respondents, as shown in the figure below. The web survey, however, reached more of California's other ethnic groups, particularly Asians and African Americans. Eight percent of web survey respondents were Asian and 6% were African American, as compared to 4% and 3% respectively in the telephone survey. The web survey demographics for those ethnic groups were better in line with the California population as a whole, which includes 12% Asians and 6% African Americans.



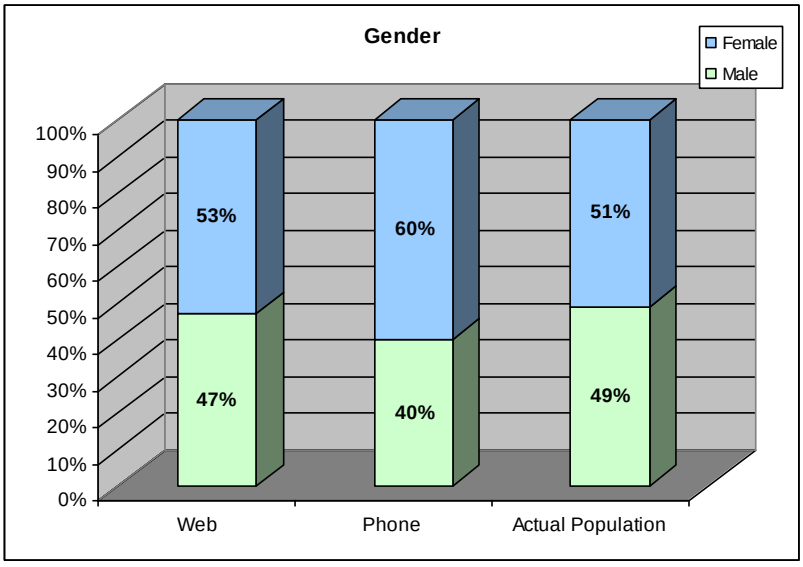
Education

The telephone survey reached both more college graduates (41%) and more respondents with less than a high school education (10%) than did the web survey. This is an important factor, as the FYPN effort targets Californians with post high school education. Nearly all of the web survey respondents had at least a high school degree (97%), and 36% were college educated. Both the web and telephone survey overrepresented high school and college educated people in relation to the actual California population.



Gender

The telephone survey was skewed towards females (60%), as is the FYPN target, whereas the web survey achieved a 53%/47% balance.



7.4 Appendices for Impact Analysis

7.4.1 References Used in Impact Analysis

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7.4.2 Tabulation of Responses from the Baseline Survey

Responses to the baseline survey questions of interest for this analysis are tabulated in this appendix.

Has Central Air Conditioning

Question D1: "Do you have any of the following in your home:

A. Central Air Conditioning
B. A heated pool
C. A washing machine
D. A dishwasher
E. Personal Computer
F. A second refrigerator
G. A standalone freezer"

Score: HasCAC =

- 1 if respondent has central air conditioning,
- 0 if not,
- 0 (first case), 0.25 (second case) if respondent replies "don't know" or "refuse to answer".

Media Market		N	Yes	No	Do Not Know	Refuse
1	Bakersfield	69	45	22	2	0
2	Chico-Redding	67	40	27	0	0
3	Eureka	71	6	65	0	0
4	Fresno-Visalia	79	62	15	2	0
5	Los Angeles	209	128	80	1	0
6	Monterey-Salinas	66	4	61	1	0
7	Palm Springs	39	35	4	0	0
8	Sacramento-Stockton	153	112	41	0	0
9	San Diego	123	58	65	0	0
10	San Francisco-Oakland-San Jose	165	56	109	0	0
11	Santa Barbara-Santa Maria-San Luis Obispo	74	16	56	2	0
12	Yuma-El Centro	7	5	2	0	0

Number of FYPN Alerts Noticed

Question 19A: "Approximately how many of those 'flex alert' messages would you say you have seen in the last year?"

Score: AlertsNoticed =

- Numeric value given by respondent, limited to a maximum of 18, the number of events in 2006.
- 3 if respondent replies "don't know" or "refuse to answer".

Media Market		N	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18+	Do Not Know	Refuse
1	Bakersfield	69	58	1	0	1	0	4	1	0	0	0	1	0	0	0	0	2	0	0	1	0	0
2	Chico-Redding	67	54	2	2	1	1	2	2	1	0	0	0	0	0	0	0	0	0	0	0	2	0
3	Eureka	71	67	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
4	Fresno-Visalia	79	52	3	3	4	1	5	3	0	0	0	1	0	0	0	0	2	0	0	0	5	0
5	Los Angeles	209	158	5	7	3	2	2	2	1	2	0	3	0	0	0	0	1	0	0	6	17	0
6	Monterey-Salinas	66	55	0	5	2	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2	0
7	Palm Springs	39	34	0	1	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	Sacramento-Stockton	153	123	3	2	4	2	3	1	0	1	0	0	0	0	0	0	0	0	0	7	7	0
9	San Diego	123	91	4	11	7	1	1	2	0	0	0	0	0	1	0	0	1	0	0	1	3	0
10	San Francisco-Oakland-San Jose	165	130	3	9	4	4	5	1	0	1	0	3	0	0	0	0	0	0	0	2	3	0
11	Santa Barbara-Santa Maria-San Luis Obispo	74	66	0	2	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	2	0	1
12	Yuma-El Centro	7	6	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0

Time Specificity of Alert Message

Question 19C: "Did the alert messages tell you to conserve energy all day or during a particular time of day?"

Score: TimeSpecific =

- 1 if "particular time of day",
- 0.25 if "all day"

- 0 if "Do not know" , or "Refuse"

and

Question 19D: "What time of day did the message tell you to conserve?"

1. Morning
2. Afternoon
3. Evening
4. Night
5. Other Specify____

-8. Do not know
-9. Refused"

Score: TimeOfAction =

- 1 if "Afternoon" or "Evening" included in response,
- 0 (first case), 0.2 (second case) if "Do not know" or "Refused".

	Media Market	N	All Day	Time Specific - Afternoon or Evening	Time Specific - Other Times	Do Not Know	Refuse	Did Not Notice Any Events
1	Bakersfield	69	0	9	1	1	0	58
2	Chico-Redding	67	0	11	2	0	0	54
3	Eureka	71	0	2	0	2	0	67
4	Fresno-Visalia	79	7	15	2	3	0	52
5	Los Angeles	209	7	31	6	7	0	158
6	Monterey-Salinas	66	3	5	2	1	0	55
7	Palm Springs	39	0	3	0	2	0	34
8	Sacramento-Stockton	153	5	18	3	4	0	123
9	San Diego	123	5	26	0	1	0	91
10	San Francisco-Oakland-San Jose	165	7	20	3	5	0	130
11	Santa Barbara-Santa Maria-San Luis Obispo	74	2	4	1	1	0	66
12	Yuma-El Centro	7	1	0	0	0	0	6

Actions Taken

Question 22: "What did you do?"

Score: TurnedDownAC =

- 1 if actions include turning thermostat down,
- 0 if not.

Media Market		N	Actions Include Raising Thermostat Setpoint	Actions Do Not Include Raising Thermostat Setpoint
1	Bakersfield	69	3	66
2	Chico-Redding	67	1	66
3	Eureka	71	1	70
4	Fresno-Visalia	79	0	79
5	Los Angeles	209	6	203
6	Monterey-Salinas	66	1	65
7	Palm Springs	39	2	37
8	Sacramento-Stockton	153	4	149
9	San Diego	123	4	119
10	San Francisco-Oakland-San Jose	165	3	162
11	Santa Barbara-Santa Maria-San Luis Obispo	74	1	73
12	Yuma-El Centro	7	1	6

Frequency of CAC Turn-down

Question 21: "After hearing the alert(s), did you turn off any equipment that uses electricity or do anything different to change how you used electricity that day?

1. Yes
2. No
3. Sometimes
-8. Do not know
-9. Refused"

Score: ActionFrequency =

- 1 if "Yes", 0 if "No",
- 0.5 if "Sometimes",
- 0 (first case), 0.25 (second case) if "Do not know" or "Refused"

Media Market		N	Always	Never	Sometimes	Do Not Know	Refuse	Did Not Notice Any Events
1	Bakersfield	69	10	3	0	0	0	56
2	Chico-Redding	67	9	4	0	0	0	54
3	Eureka	71	3	2	0	0	0	66
4	Fresno-Visalia	79	20	9	0	1	0	49
5	Los Angeles	209	32	21	0	1	0	155
6	Monterey-Salinas	66	8	4	2	0	0	52
7	Palm Springs	39	4	1	0	0	0	34
8	Sacramento-Stockton	153	23	11	1	1	0	117
9	San Diego	123	25	9	1	1	0	87
10	San Francisco-Oakland-San Jose	165	23	13	0	1	0	128
11	Santa Barbara-Santa Maria-San Luis Obispo	74	5	5	0	0	0	64
12	Yuma-El Centro	7	1	0	0	0	0	6

7.4.3 Tabulation of Responses from the Post-Event Survey

Responses to the post-event survey questions of interest for this analysis are tabulated in this appendix.

Timeliness of Survey

FYPN events were called on August 29, 30, and 31, 2007. The post-event survey was conducted from August 30 to September 9, 2007. One of the questions in the survey asked if respondents had seen or heard an advertisement to conserve electricity *during the past four days.* However, 271 of 615 interviews were conducted more than four days after the last FYPN event. Analysis was conducted both with and without results collected more than four days after the event. There was not a significant difference between estimated impact with and without these observations; these observations were ultimately used to decrease the confidence interval of the results. Tabulation reported here is for *all* observations.

Event Noticed

"Question1: During the last four days, did you change anything about how you normally use electricity?"

Score:

- 1 if "yes"
- 0 if any other answer

Media Market		N	Yes	No	Do Not Know	Refuse
1	Bakersfield	0	0	0	0	0
2	Chico-Redding	58	7	51	0	0
3	Eureka	13	3	10	0	0
4	Fresno-Visalia	70	14	56	0	0
5	Los Angeles	84	30	53	0	1
6	Monterey-Salinas	27	7	20	0	0
7	Palm Springs	0	0	0	0	0
8	Sacramento-Stockton	84	25	59	0	0
9	San Diego	84	41	43	0	0
10	San Francisco-Oakland-San Jose	84	22	61	1	0
11	Santa Barbara-Santa Maria-San Luis Obispo	43	4	39	0	0
12	Yuma-El Centro	68	8	60	0	0

Actions Taken

"Question 2: Please describe what you did"

Score:

- 1 if air conditioner setpoint was raised
- 1 if respondent went to a mall or other public space with air conditioning
- 0 if "Do no know" or "Refused"

Media Market		N	Changed Thermostat Setpoint	Went to Air Conditioned Public Space	Do Not Know	Refuse
1	Bakersfield	0	0	0	0	0
2	Chico-Redding	58	0	0	0	0
3	Eureka	13	0	0	0	0
4	Fresno-Visalia	70	5	0	0	0
5	Los Angeles	84	12	0	0	0
6	Monterey-Salinas	27	1	0	0	0
7	Palm Springs	0	0	0	0	0
8	Sacramento-Stockton	84	9	0	0	0
9	San Diego	84	3	1	0	0
10	San Francisco-Oakland-San Jose	84	3	0	0	0
11	Santa Barbara-Santa Maria-San Luis Obispo	43	0	0	0	0
12	Yuma-El Centro	68	2	0	0	0

Time Specific

Question 6: "When did the ad or announcement tell you to conserve electricity? Did it tell you to conserve…

1. Over the long-term?
2. Seasonally?
3. On a particular day?
4. At a particular time of day?
5. OTHER (PLEASE SPECIFY _____)
6. DURING HEAT WAVE
9. DON'T KNOW
10. REFUSED"

Score:

- 1 at a particular time of day
- 0.25 on a particular day or during a heat-wave
- 0 for all other answers

Media Market		N	Particular Time of Day	Particular Day or During Heat Wave	Do Not Know
1	Bakersfield	0	0	0	0
2	Chico-Redding	58	14	1	6
3	Eureka	13	3	1	1
4	Fresno-Visalia	70	16	3	5
5	Los Angeles	84	28	3	7
6	Monterey-Salinas	27	6	2	2
7	Palm Springs	0	0	0	0
8	Sacramento-Stockton	84	28	7	3
9	San Diego	84	32	10	11
10	San Francisco-Oakland-San Jose	84	15	8	10
11	Santa Barbara-Santa Maria-San Luis Obispo	43	10	1	7
12	Yuma-El Centro	68	11	3	5

7.4.4 Tabulation of Responses from the Post-Summer Survey

Responses to the post-summer survey questions of interest for this analysis are tabulated in this appendix.

Has Central Air Conditioning

Question D1: "Do you have any of the following in your home:

A. Central Air Conditioning
B. A heated pool
C. A washing machine
D. A dishwasher
E. Personal Computer
F. A second refrigerator
G. A standalone freezer"

Score: HasCAC =

- 1 if respondent has central air conditioning,

- 0 if not,
- 0 if respondent replies "don't know" or "refuse to answer".

Media Market		N	Yes	No	Do Not Know	Refuse
1	Bakersfield	71	42	29	0	0
2	Chico-Redding	71	46	25	0	0
3	Eureka	71	10	61	0	0
4	Fresno-Visalia	92	72	20	0	0
5	Los Angeles	218	130	87	1	0
6	Monterey-Salinas	72	8	64	0	0
7	Palm Springs	48	41	7	0	0
8	Sacramento-Stockton	161	120	41	0	0
9	San Diego	161	73	88	0	0
10	San Francisco-Oakland-San Jose	181	62	118	1	0
11	Santa Barbara-Santa Maria-San Luis Obispo	71	13	58	0	0

Number of FYPN Alerts Noticed

Question 14: "Approximately how many of those 'flex alert' messages would you say you have seen in the last year?"

Score: AlertsNoticed =

- Numeric value given by respondent, limited to a maximum of 6, the number of events in 2006.
- 0 if respondent replies "don't know" or "refuse to answer".

Media Market		N	0	1	2	3	4	5	6+	Don't know
1	Bakersfield	71	48	3	3	2	2	3	5	5
2	Chico-Redding	71	52	4	4			3	5	3
3	Eureka	71	53	1	7		2	2	4	2
4	Fresno-Visalia	92	61	2	6	4	4	4	8	3
5	Los Angeles	218	139	2	7	15	4	6	31	14
6	Monterey-Salinas	72	50	1	4	2		3	4	8
7	Palm Springs	48	31	1		2	1	2	7	4
8	Sacramento-Stockton	161	106	5	9	8	2	6	15	10
9	San Diego	161	105	6	7	10	2	6	15	10
10	San Francisco-Oakland-San Jose	181	123	2	8	10	3	6	14	15
11	Santa Barbara-Santa Maria-San Luis Obispo	71	50	3	5	1		2	6	4

Time Specificity of Alert Message

Question 23: "Did the alert messages tell you to conserve energy all day or during a particular time of day?"

Score: TimeSpecific =

- 1 if "particular time of day",
- 0.25 if "all day"
- 0 if "Do not know" , or "Refuse"

and

Question 24: "What time of day did the message tell you to conserve?"

6. Morning
7. Afternoon
8. Evening
9. Night
10. Other Specify____
-8. Do not know
-9. Refused"

Score: TimeOfAction =

- 1 if "Afternoon" or "Evening" included in response,
- 0 if "Do not know" or "Refused".

Media Market		N	All Day	Time Specific: Afternoon or Evening	Time Specific - Other Times	Don't Know	Did Not Notice Any Events
1	Bakersfield	71	4	10	5	6	46
2	Chico-Redding	71	7	10	6	0	48
3	Eureka	71	1	12	2	4	52
4	Fresno-Visalia	92	8	15	3	5	61
5	Los Angeles	218	26	37	7	11	137
6	Monterey-Salinas	72	8	8	1	6	49
7	Palm Springs	48	5	7	3	3	30
8	Sacramento-Stockton	161	11	31	6	7	106
9	San Diego	161	12	32	5	11	101
10	San Francisco-Oakland-San Jose	181	19	28	8	8	118
11	Santa Barbara-Santa Maria-San Luis Obispo	71	4	10	1	6	50

Actions Taken

Question 27: "What did you do?"

Score: TurnedDownAC =

- 1 if actions include turning thermostat down,
- 0 if not.

Media Market		N	Actions Include Raising Thermostat Setpoint	Actions Do Not Include Raising Thermostat Setpoint
1	Bakersfield	71	7	64
2	Chico-Redding	71	7	64
3	Eureka	71	5	66
4	Fresno-Visalia	92	13	79
5	Los Angeles	218	26	192
6	Monterey-Salinas	72	2	70
7	Palm Springs	48	4	44
8	Sacramento-Stockton	161	24	137
9	San Diego	161	16	145
10	San Francisco-Oakland-San Jose	181	19	162
11	Santa Barbara-Santa Maria-San Luis Obispo	71	5	66

Frequency of CAC Turn-down

Question 25: "After hearing the alert(s), did you turn off any equipment that uses electricity or do anything different to change how you used electricity that day?
1. Yes
2. No
3. Sometimes
-8. Do not know
-9. Refused"

Score: ActionFrequency =
- 1 if "Yes", 0 if "No",
- 0.5 if "Sometimes",
- 0 if "Do not know" or "Refused"

Media Market		N	Always	Never	Sometimes	Do Not Know	Did Not Notice Any Events
1	Bakersfield	71	12	10		3	46
2	Chico-Redding	71	14	7	1	1	48
3	Eureka	71	8	9	1	1	52
4	Fresno-Visalia	92	25	5		1	61
5	Los Angeles	218	57	20	3	1	137
6	Monterey-Salinas	72	13	6	1	3	49
7	Palm Springs	48	11	7			30
8	Sacramento-Stockton	161	40	14	1		106
9	San Diego	161	34	23	1	2	101
10	San Francisco-Oakland-San Jose	181	39	21		3	118
11	Santa Barbara-Santa Maria-San Luis Obispo	71	10	10		1	50

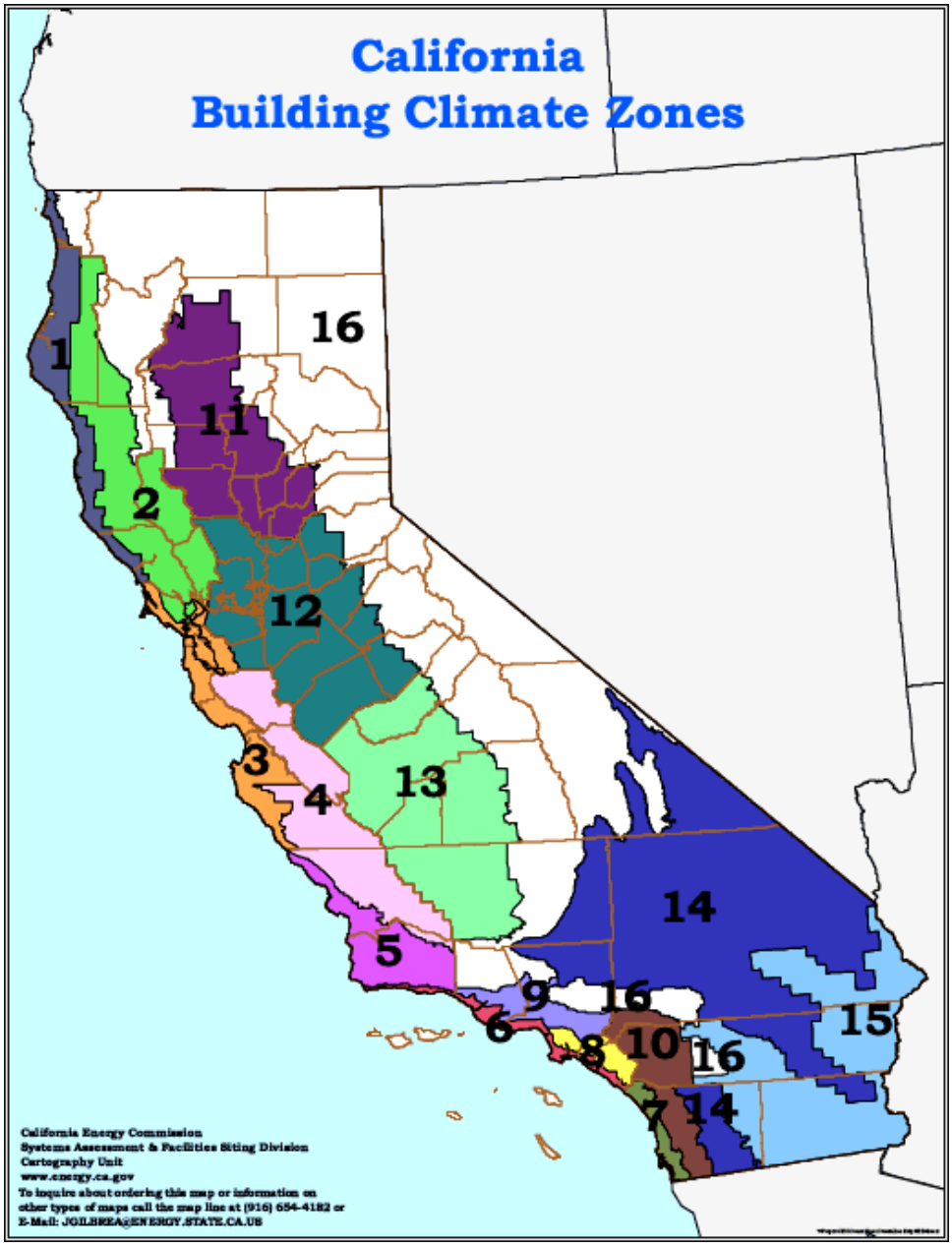
7.4.5 California Population (2000) by Media Market and Climate Zone

CLIMATE ZONE	01 - Bakersfield & Los Angeles	02 - Chico-Redding	03 - Eureka	04 - Fresno-Visalia	05 - Los Angeles	06 - Monterey-Salinas	07 - Los Angeles & Palm Springs	08 - Sacramento-Stockton-Modesto	09 - San Diego	10 - San Francisco-Oakland-San Jose	11 - Santa Barbara-Santa Maria-San Luis Obispo	12 - Yuma-El Centro	Grand Total	*% of Total California Population*
1	0	0	119,907	0	0	0	0	0	0	32,729	0	0	152,636	*0%*
2	0	510	10,109	0	0	0	0	0	0	894,634	0	0	905,253	*3%*
3	0	0	0	0	0	597,779	0	0	0	3,084,755	0	0	3,682,534	*11%*
4	0	0	0	0	0	106,705	0	0	0	1,718,274	82,857	0	1,907,836	*6%*
5	0	0	0	0	0	0	0	0	0	0	386,234	0	386,234	*1%*
6	0	0	0	0	2,465,201	0	0	0	0	0	176,451	0	2,641,652	*8%*
7	0	0	0	0	34,932	0	0	0	1,936,876	0	0	0	1,971,808	*6%*
8	0	0	0	0	4,481,097	0	0	0	0	0	0	0	4,481,097	*13%*
9	0	0	0	0	5,808,931	0	0	0	0	0	0	0	5,808,931	*17%*
10	0	0	0	0	1,168,573	0	1,160,735	0	857,148	0	0	0	3,186,456	*9%*
11	0	422,791	0	0	0	0	0	434,509	0	0	0	0	857,300	*3%*
12	0	0	0	223,146	0	0	0	2,622,786	0	1,202,667	0	0	4,048,599	*12%*
13	542,693	0	0	1,396,723	0	0	0	0	0	0	0	0	1,939,416	*6%*
14	38,323	0	0	0	665,662	0	2,425	0	16,779	0	0	287	723,476	*2%*
15	0	0	0	0	7,176	0	374,013	0	2,856	0	0	140,500	524,545	*2%*
16	82,160	46,272	24,299	25,667	215,043	0	8,822	154,987	0	0	0	0	557,250	*2%*
Grand Total	663,176	469,573	154,315	1,645,536	14,846,615	704,484	1,545,995	3,212,282	2,813,659	6,933,059	645,542	140,787	33,775,023	
% of Total California Population	*2%*	*1%*	*0%*	*5%*	*44%*	*2%*	*5%*	*10%*	*8%*	*21%*	*2%*	*0%*		

This table was derived from data in

- Nielsen Media Research, "Nielsen Media Research Designated Market Areas 2006-2007" map, (*available for purchase from Nielsen Media Research*)
- United States Census Bureau, "United States Census, 2000", http://www.census.gov/main/www/cen2000.html
- California Energy Commission, "California Climate Zones by ZIP CODES", http://www.energy.ca.gov/maps/CLIMATE_ZONES_ZIPCODE.PDF

The following is a map of CEC building climate zones.



Source: California Energy Commission, *www.energy.ca.gov/maps/building_climate_zones.gif*

7.4.6 2005 Electricity Usage During Peak Periods

	Megawatts	Percentage of Total
Commercial Sector	**20,907**	**39%**
Air Conditioning	7,690	14%
Cooking	120	0%
Exterior Lighting	63	0%
Hot Water	153	0%
Interior Lighting	6,171	11%
Office Equipment	277	1%
Other	3,489	6%
Refrigeration	978	2%
Space Heating	-	0%
Ventilation	1,967	4%
Residential Sector	**21,765**	**40%**
Air Conditioning	11,154	21%
Cooking	1,187	2%
Dishwasher	331	1%
Domestic Hot Water*	300	1%
Dryer	1,196	2%
Freezer	377	1%
Miscellaneous**	3,568	7%
Pools & Spas***	995	2%
Refrigeration	1,827	3%
Space Heating	-	0%
Television, Video, Satellite	544	1%
Washer	135	0%
Waterbed	153	0%
Industrial Sector	**7,415**	**14%**
Assembly	3,615	7%
Process	2,906	5%
Other	893	2%
Agricultural Sector	**1,959**	**4%**
TCU & Street Lighting	**1,973**	**4%**
Statewide Total	**54,020**	**100%**

Source: Demand Analysis Office, California Energy Commission. Available online at http://www.energy.ca.gov/electricity/peak_loads.html.