California Bill Analysis Pilot

Final Report

A Research Project Conducted as Part of the California Statewide Pricing Pilot (R) 02.06.001

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Executive Summary

This report presents the results of the California Bill Analysis Pilot program conducted during the summer of 2005 with customers in Southern California Edison (SCE), San Diego Gas and Electric (SDG&E), and Pacific Gas and Electric (PG&E) service territories. The pilot was designed to quantify the benefits of providing customers on dynamic pricing tariffs site-specific diagnostic information as a supplement to their standard utility bill, as part of an ongoing investigation of the benefits of enhanced information for electric pricing options for residential customers.

The Bill Analysis Pilot is an extension of the California Statewide Pricing Pilot (SPP) that began in 2003, in which a sample of customers was offered advanced meters that measured hourly electric use, and time-based electric rates of several designs, in order to determine their responsiveness to dynamic pricing. In 2004, an initial pilot examination was conducted of enhanced information treatments - including Web tools, mail information, and Energy Orb displays - to see if there were potential benefits from assisting customers with their understanding of rates and their response during high-price critical peak periods.

This 2005 study focuses on a more narrowly defined scope than do previous efforts: diagnostic billing information was offered only by Web and mail (without in-home display devices), and the target was limited to residential households who remained voluntarily on the SPP critical peak pricing rates. The objective of this study was to determine the extent to which customized bill analysis would be helpful to these customers in understanding and managing their energy use under the SPP rates, as well as whether this information would amplify their price response and increase their energy savings.

The Bill Analysis Pilot included 152 participants and 118 who served as a control sample. Details regarding the program approach and messages are summarized in Section 1 (Introduction) and Section 2 (Methodology).

The pilot project was evaluated through both qualitative and quantitative methods:

- Participant and control group surveys, as well as two focus group sessions, were conducted at the conclusion of the program to determine the extent to which bill analysis had an effect on customer knowledge and behavior.
- A quantitative impact analysis was conducted using the difference of differences method. Statistical significance of average hourly load impacts was determined based on sample variance and a normal distribution assumption. Further, a nonparametric approach was used to determine if the percentage of customers who used less energy as a result of the bill analysis was statistically significant.
- Website traffic and e-mail click-through data were collected to characterize use and interaction with the bill analysis website and e-mail.

The primary conclusions of the evaluation are summarized below with references to the section of the report in which specific results are discussed.

<u>First, participants engaged actively with the bill analysis. They found it useful and reported that it caused them to take actions to reduce peak usage, resulting in lower electricity bills.</u>

- Most participants – 77% - visited the website at some point during the program. Further, participants began using the program website immediately and the website remained active throughout the summer. This level of use is remarkable when compared to that seen for comparable utility sites offering bill information, where 1-3% of a target population typically visits a website on their own when informed of its benefits.[1] (Section 3.3)
- Many participants found the bill analysis useful in helping them reduce their usage. Nearly half (47%) of survey respondents found the bill analysis useful. An additional 37% gave a more neutral rating, while only 10% felt that it was not useful. (Section 4.1)

  "It absolutely was helpful. … I started being more careful of when I do a load of laundry… I always thought that peak time was … just until five o'clock … and then I realized peak time is seven. It slowed me down from doing things like laundry and running my dishwasher ... I was more careful thanks to the billing analysis."

- A significant portion of survey respondents (46%) stated that they took actions during the critical peak periods that they would not have taken if they hadn't received the bill analysis; and 49% of respondents stated that they took additional actions during regular peak periods because of the bill analysis. (Section 4.1)

  "It showed us where we could cut and save a little more. We had a pool running, the air conditioner, a lot of bigger stuff. We just started cutting back.

- Most participants (62%) noticed reductions in their bills since participating in the CPP-F rate, and approximately half of the participants (51%) noted reductions due to the bill analysis. (Section 4.1)

  "After we got it and started making some adjustments… I got into the program and I saw a definite change in our PG&E bill. We started replacing appliances and everything else, and my bill dropped dramatically."

<u>Second, the quantitative impact analysis showed savings, with statistical significance for some, but not all, results.</u>

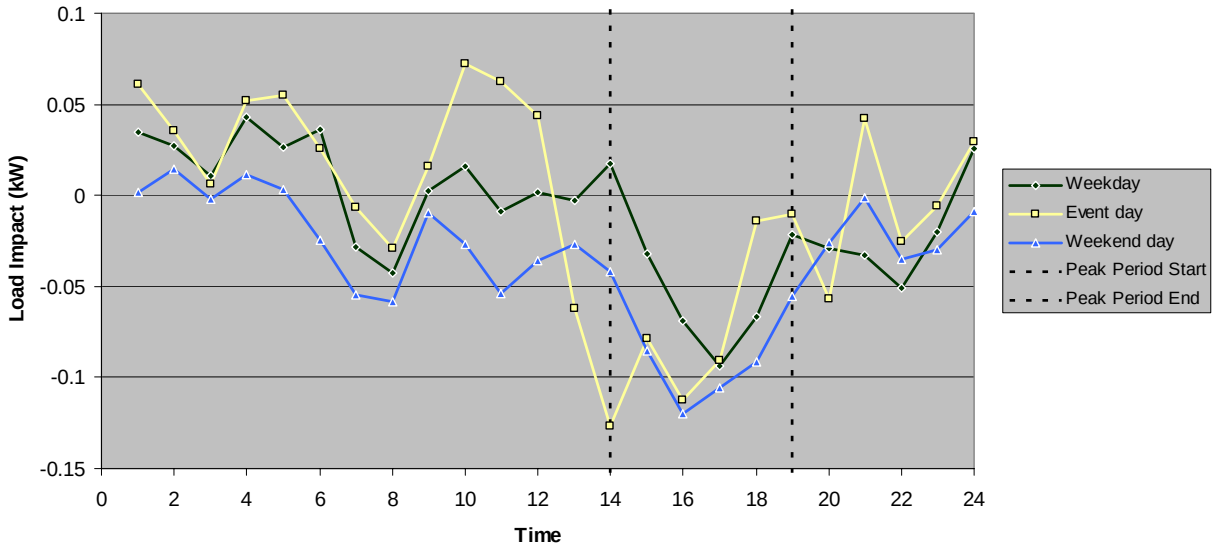
- The bill analysis appeared to have an impact between 2 pm and 7 pm on all days (critical peak event days, weekdays, and weekends)[2]. This suggests a general "conservation effect"

[1] Based on Nexus Energy Software experience with utility clients.

[2] Peak periods are weekdays between 2 and 7 pm. Critical peak periods are between 2 and 7 pm on days on which a critical peak event is called. In 2005, critical peak events were called on July 12, 13, 14 and 22; August 26; September 28 and 29; and October 6, 7, 13, 14.

attributable to the bill analysis, with customers making changes that become habitual, rather than just in reaction to a critical peak or peak pricing signal. (Sections 4.2, 4.3, 4.4)

Average Adjusted Load Impacts



- The load savings during critical peak periods ranged from a low of 0.010 kW to a high of 0.113 kW, for an average critical peak period savings of 0.061 kW. Given the magnitude of these savings, the sample size, and an assumed normal distribution of variance, these impacts were not found to be statistically significant. (Section 4.3)

Average Adjusted Load Impacts, All Day Types

Hour ending	Event day	Weekday	Weekend day
3:00 pm	-0.078	-0.032	-0.086
4:00 pm	-0.113	-0.069	-0.120
5:00 pm	-0.091	-0.094	-0.106
6:00 pm	-0.014	-0.067	-0.091
7:00 pm	-0.010	-0.022	-0.055
Average across peak hours	**-0.061**	**-0.057**	**-0.091**

- Over certain time periods (peak periods, weekdays generally, and weekends generally), a statistically significant portion of bill analysis participants were found to be more likely to reduce energy use as a result of receiving the bill analysis. This effect was not observed during other time periods including critical peak periods. This again suggests a general "conservation effect" attributable to the bill analysis that may not hold during critical peak periods. (Section 4.4)

Finally, participants are interested in continuing a bill analysis program and provided considerable feedback applicable to a larger-scale rollout of a similar bill analysis program.

- Most participants want to continue receiving the bill analysis. Only 12% of them said they would not want to receive it in the future. (Section 5.3)
- While recipients of the bill analysis generally felt that each section of the bill analysis was clear and well presented, they provided several detailed suggestions to improve the bill analysis presentation. (Section 5.1 and Section 7, Discussion and Recommendations)

> *"I think it's great the way they have it broken down by the actual amount during each of those peak periods. It makes me more aware of what the cost is. I think that's great, and I think it's pretty clear."*
>
> *"They had a lot of good ideas, especially in the area where they have that savings checklist [that] tells you more or less the times that are the better times to do certain things and how much of a savings… when you actually see numbers it's very helpful, and I think if that wasn't on there I probably wouldn't even think twice about it."*

- While customers wanted the bill analysis to continue, the majority is not willing to pay for the bill analysis. However, approximately one-third (29%) of participants and 17% of non-participants stated that they **are** willing to pay at least $12 per year (or $1 per month) for this type of information. (Section 5.2).
- Most participants want to continue receiving the bill analysis. Only 12% of them said they never want to receive it. Those that have a computer appear to prefer e-mail to hard copy but many pilot customers do not have computers. Most mail participants (74%) want to continue receiving the bill analysis by mail. Whether or not customers want to receive the information by e-mail is primarily due to whether or not they have a computer. (Section 5.3)

Notably, the process of supplementing utility bill information on the Web using the techniques in this pilot is relatively inexpensive – a large-scale rollout would cost $2-$4 per customer per year. It is the low cost of providing site-specific energy diagnostics to customers on the Web, as compared with the much higher costs of in-home hardware such as sub-metering equipment or in-home display devices that make this approach important to evaluate as part of an ongoing consideration of dynamic pricing rates and advanced meter options in California.