

## **The Prevalence of Energy Efficiency and PG&E Rebate Programs in Fruitvale, CA**

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### **ABSTRACT**

America has recognized the importance of implementing energy efficiency strategies to help make-up for the energy crisis that came about in the 1970's. Various energy efficiency programs came about since this energy crisis, making energy efficiency something more available to the general public in recent years. The question then becomes whether this applies to the low-income community as well. This project will analyze PG&E led energy efficiency programs and their prevalence in Fruitvale - a low-income, predominantly Latino neighborhood in Oakland, CA. The project will provide helpful information on how PG&E's energy efficiency programs are understood and utilized by Fruitvale community members. I examined the association between income, education level, and ethnicity to adoption of PG&E's energy efficiency programs using the responses from a survey. The data provides a better understanding of how much people in Fruitvale know about PG&E's rebate programs, how much they are using them, and perhaps what can be done to increase adoption of the programs in an effort to promote energy efficiency and save PG&E customers money.

### **KEYWORDS**

Energy efficiency, low-income, rebate, access, Fruitvale

## **INTRODUCTION**

The oil embargo of 1973 spawned the ‘energy crisis’ and soon enough energy production and conservation became major public policy issues in the U.S. (Coltrane, Archer, & Aronson 1986). Since then, individual states have engaged in a wide range of energy activities to promote energy conservation, some with the assistance and guidance of the federal government, some on their own initiative (Randolph 1984). The states have broadened their traditional responsibility of regulating electric and natural gas utilities to involve the utilities in regulating electric and natural gas utilities to involve the utilities in conservation and renewable energy programs. In California, as well as in other states, utilities are actively engaging in conservation managing programs because legislature has mandated them to do so (Randolph 1984). Since utilities have billing and other information on their customers, they can target energy conservation campaigns to specific groups of customers, such as compact fluorescent lamps for residential buildings (Dutt and Mills 1994), allowing energy efficiency to be more attainable to the general public.

PG&E, the Pacific Gas & Electric Company, became one of the first utilities in the nation to offer energy efficiency programs to its customers since the inception of these programs in 1976 ([www.pge.com](http://www.pge.com)). Some of its current programs consist of the CFL (Compact Fluorescent Lamp) Instant Rebates Program, the Appliance Rebates Program, the Remodeling Rebates Programs, and the Appliance Recycling Rebates Program. The purpose of these programs are to provide people with incentives to take part in the energy conservation efforts, as well as save them money on their energy bill. Other utility providers in California are doing similar things to combat the energy crisis and increase energy conservation. The Southern California Edison Company (SCE) provides low-income customers with free CFL’s to replace incandescent ones

and conserve energy. The Southern California Gas Company (SoCalGas) provides services such as the installation of ceiling insulation, weather stripping, caulking, heater blankets, and switch and outlet gaskets. (Assembly Bill 2140 Implementation 2007). Energy utilities may be especially effective in facilitating energy savings to their customers because of important regional differences (Frieden 1981; Cannon 1980). Indeed, each utility company is able to cater to the needs of the specific regions it serves and will know best how to promote energy efficiency to its customers.

Whether people are adopting energy efficiency strategies equally across different demographic areas, however, is still in question. A study done by Rice University found that people were more likely to participate in Houston's energy efficiency program if it increase the value of their home (Ernst et. at. 2010). This implies that can afford homes are more likely to participate. Also, in a study done in India, researchers found that there was an increased probability of household adoption of CFL light bulbs with higher education and income levels (Kumar et. al. 2003). Perhaps this is true because as a study done in the U.S. shows, low-income households already consume less energy than do households on average, and certainly less than non-low-income households (Colton 2002). The high initial costs of energy-efficient alternatives, may also be affecting the success of the rebate programs. For example, a CFL bulb costs many times more than an incandecent one, placing a psychological as welll as a capital-cost barrier to its purchase (Dutt and Mills 1984). Or perhaps its because, as Higgins and Lutzenhizer propose, socioeconomic stratification can lead to the asymmetrical distribution of goods (1995). For this reason it is important that PG&E's rebate programs are accessible and properly promoted to all communities.

PG&E is attempting to help people adopt energy efficiency strategies at home, but are people in Fruitvale familiar with its rebate programs? What demographic factors most strongly influence the people of Fruitvale's participation in the rebate programs? This study aims to analyze the prevalence of PG&E's energy efficiency rebate programs in Fruitvale, considering its demographics. I will see if there is an association between program usage and various factors including education level, income, and ethnicity. I hypothesize that the people of Fruitvale will have relatively little knowledge on PG&E's rebate programs because it is a predominantly low-income, therefore least likely to purchase energy-efficient items that are initially more expensive.

## METHODS

### Site description

The study assessed PG&E's rebate programs prevalence in the predominantly low-income, ethnic neighborhood of Fruitvale in Oakland, CA. Approximately 49% of households in Fruitvale earned less than \$30,000 per year compared to 28% in all of Alameda County. The population of Fruitvale is 90% minorities. Hispanics/Latinos make up 52% of the population, Asians/Pacific Islanders 23%, African-Americans 16%, whites 7%, Native Americans 2%, and all others make up the remaining 1% ([www.fhwa.dot.gov](http://www.fhwa.dot.gov)). I conducted surveys specifically in the Fruitvale Village area, near the Fruitvale BART station because of the large amount of people that walk by there everyday. The Farmers Market also establishes there every Thursday, providing a great opportunity to find people to take the survey.

## Collecting and analyzing data

I conducted 47 surveys with a partner on two separate Thursday afternoons when the Farmers Market was present. I used a convenience sampling approach, surveying that those seemed to be the least in a hurry and were willing to take the survey when asked.

I then used Excel to help me determine the percentages of people that were performing energy-efficient practices for which they could obtain a rebate. I also used Excel to help me find the percentages of people familiar with each PG&E rebate program and the percentages of people who have used any of the programs in the past. I also looked at rebate usage by education level, income, and race/ethnicity to give me an idea of what demographic factors might most strongly influence a person's participation in the rebate programs.

## RESULTS

**Table 1. A comparison of energy-efficient practices, rebate program knowledge, and rebate program usage.**

Energy efficient practice eligible for rebate	% That performed energy-efficient practice	Type of program	% Familiar with the program	% That have used the program	% That performed energy-efficient practice - % That have used the program	% Familiar with the program - % That have used the program
Changed incandescent bulbs to CFL bulbs	72.3	CFL Instant Rebates	68.1	34	38.3	34.1
Purchased Energy Star appliances	34	Appliance Rebates	51.1	8.5	25.5	42.6
Installed energy-efficient cool roof	4.3	Home Remodeling Rebates	8.5	0	4.3	8.5
Installed new insulation in attic and walls	2.1				2.1	
Installed energy-	12.8				12.8	

efficient water heater						
Recycled old working refrigerator	21.3	Appliance Recycling Rebates	53.2	8.5	12.8	44.7
Recycled old working room air conditioner	17				8.5	

Nearly three quarters of the sampled population stated to have changed their incandescent light bulbs to CFL’s at home. 68.1% of those surveyed said that they were familiar with PG&E’s CFL Instant Rebates program and 34% said that they have taken advantage of it. This means that a total 38.3% of the people that could have taken advantage of PG&E’s rebate program did not because they might not have known about it. In regards to Energy Star appliances, 34% of the population claimed to have purchased one in the past, 51.1% knew about the rebate program, and only 8.5% had ever made use of it. A mere 4.3% claimed to have installed an energy-efficient cool roof, 2.1% claimed to have installed new insulation, and 12.8% claimed to have installed a new energy-efficient water heater. All of these energy-efficient practices are included in the Home Remodeling Rebates program, yet only 8.5% of the sampled population was familiar with it and nobody had used it. 21.3% of people surveyed said that they had recycled an old working refrigerator and 17% said that they had recycled and old working room air conditioner. More than half of the sampled population knew about PG&E’s Appliance Recycling Rebates program, yet only 8.5% had ever made use of it.

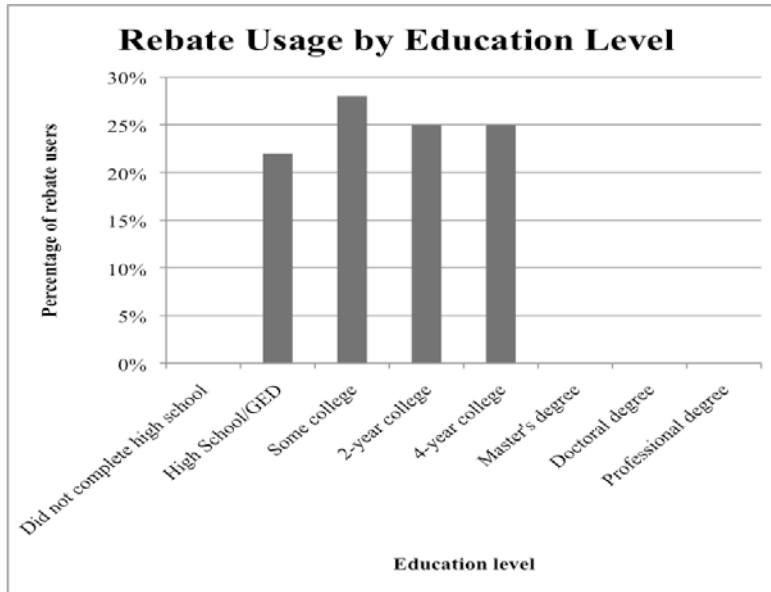


Figure 1. Percentage of rebate users by level of education.

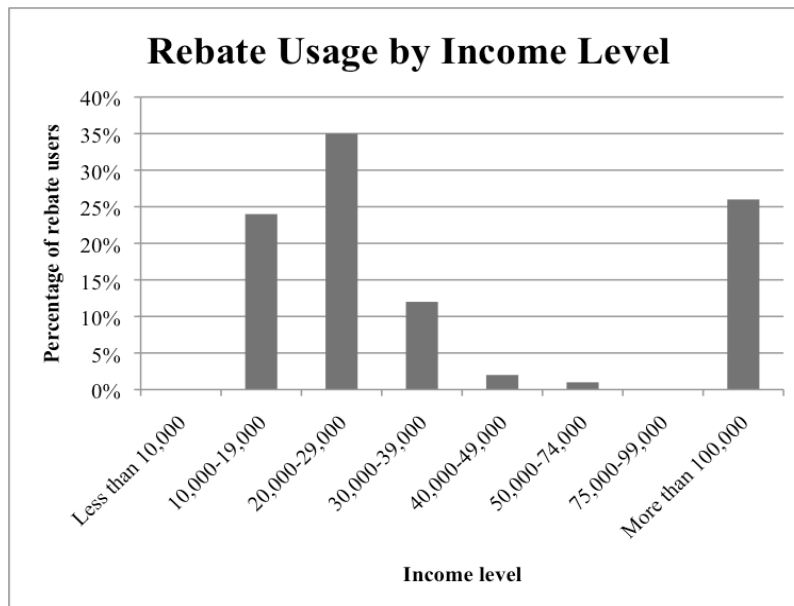
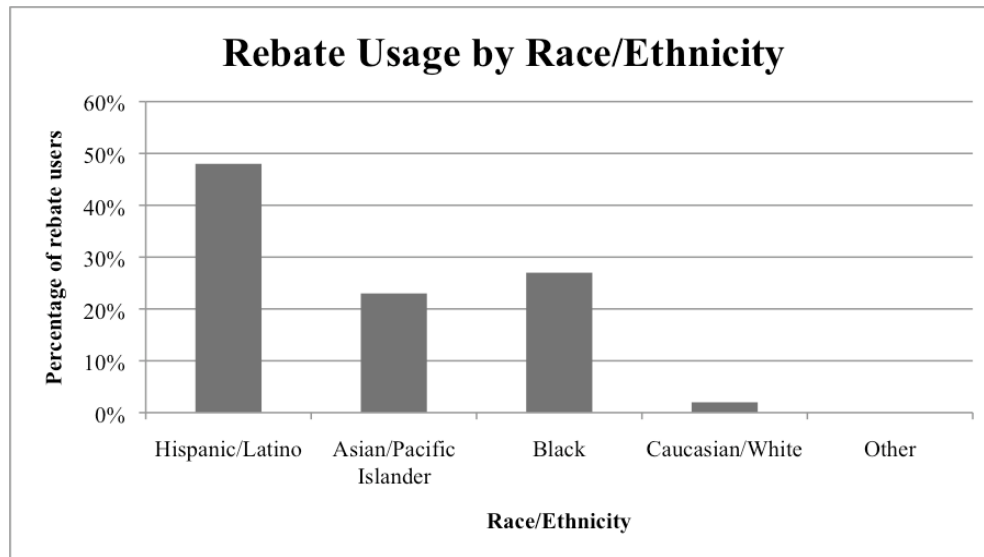


Figure 2. Percentage of rebate users by income level.



**Figure 3. Percentage of rebate users by stated race/ethnicity.**

Figures 1, 2, and 3 demonstrate rebate usage in comparison to education level, income level, and race/ ethnicity. Most rebate users have had some college education, had an income between \$20,000 and \$29,000 per year, identified as Hispanic/Latino, or were any combination of these three characteristics. None of these associations followed a definitive trend, but there are some things worth paying closer attention to that will be discussed in the following section.

## DISCUSSION

As I expected, there was a lack of adoption of PG&E's rebate programs in Fruitvale. We should notice that in the area of study there is a high Latino population and that most of the people that claimed to have used PG&E's programs were English-speaking. From speaking to people, I found that language prevented some people from using the programs because it was difficult for them to learn more about them.

My hypothesis that rebate usage would be strictly limited by income, however, was wrong. According to Reddy, people with higher incomes tended to purchase CFL light bulbs more often



than those with a low income. He finds that those with lower incomes were more worried about fulfilling basic necessities than with purchasing CFL's (1991). For this reason, I thought that the same would apply to rebate usage. I was surprised to see that rebate usage was actually most spread across in relation to income than education level or ethnicity. I found that there are peaks at the low-income and high-income levels. This raises the question that perhaps it is the middle-income households that are least aware of PG&E's rebate programs or the least concerned with participating in them.

Rebate usage was most concentrated in the High School through 4-year college education levels. This, however, could have been due to the fact that not all education levels were represented in the study. In order to determine whether education is actually a factor in rebate program usage, a comparison of rebate usage across equally represented education levels would have to be made. The same applies to association between race/ ethnicity and rebate usage implied by this study. Most of the users were Hispanic/Latino, which might have been because most Fruitvale residents are also Hispanic/Latino.

## **CONCLUSION AND RECOMMENDATIONS**

By improving the promotion and accessibility to energy efficiency rebate programs to low-income, ethnic communities like Fruitvale, the United States will come closer to addressing its dependency on foreign oil as well as other environmental issues. Energy efficiency is becoming more important and it is crucial that everyone acknowledges this and does something to help. We can make PG&E's rebate programs more available to communities like Fruitvale, by providing more information in Spanish and via mediums other than the Internet. When talking to people, I found that many of them had heard about the programs through the radio and by word

of mouth, therefore it is important that we continue to promote that. It is important that we do this and outreach to those that do not necessarily know much about environmental issues or have the resources to make sustainable changes to their lifestyle to educate them prompt them to inspire their children think about the issues as well.

Taschian et al. (1984) state, “promotion is generally most effective when it enhances attitudes rather than attempting to change them” (146). As implied by this study, one way of increasing energy efficiency in the United States is by promoting programs like those provided by PG&E, which offer incentives to be more energy savvy. Another way, however, would be to involve disincentives for consumption rather than incentives for conservation (Taschian et al. 1984). Raising the prices of incandescent light bulbs and of non energy-efficient appliances, for example, might convince people to go for the eco-friendly options instead. In an effort to decrease energy consumption and dependency on foreign oil, raising the prices on these products is something we should start considering in addition to the efforts put forward by utility companies like PG&E.

### **Limitations**

This study did not go without its limitations. The survey for example, was not enough to help me gather the information needed to determine people’s awareness and adoption of PG&E’s programs in the entire neighborhood of Fruitvale. It would have been helpful to have information on how many rebates have been submitted by Fruitvale residents in comparison to other neighborhoods directly from PG&E themselves. Also, I was unable to conduct as many surveys as I would have liked. The study would have gained statistical power if I had been able to collect

more data from the Fruitvale area, perhaps even from places besides near the BART station. I was pressed for time toward the end and had to settle with the information that I had collected so far. Another limitation in this study was the absence of a mentor. Fortunately I had Kurt and Seth to guide me along the way, but having a mentor more familiar with some of the topics touched upon in this project could have been beneficial in the process. Toward the end I realized I should have been wiser with my time and carried on my data collection earlier on. This would have been helpful in all aspects of the project.

### **Future directions**

Future studies can and should be conducted based on the findings of my study. It is important that we gain further information on the effectiveness of utility company led energy efficiency programs so that we can outreach to a larger population. As, Reddy has found in his study, people with higher incomes tend to be the ones that participate in energy efficiency efforts and in programs like these. However, a large part of the population in the United States is either middle class or low-income and possibly unaware of environmental issues and programs like those provided by PG&E, which can help them help address the issues.

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