

# **Reaching the Unreachable**

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## **ABSTRACT**

This paper describes the Refrigerator Replacement Program (RRP) created to enable low-income electric customers to establish long-term energy reduction. The program focuses on meeting the needs of this segment of the City of Lompoc's customer base, as well as the requirements of legislation created to restructure California's electric industry. The paper is not intended to analyze electric reduction of an appliance replacement program, or to study the actual cost of such a program, but to detail how the program was created and how it benefits the customer.

## **Introduction**

In 1996 the State of California enacted legislation (AB 1890) directing the creation of a new electric market structure, basically restructuring the electric industry in California. Under this legislation, publicly owned utilities such as Lompoc City Electric are required to establish a non-bypassable usage-based charge (Public Benefit Tax) to fund investments in four areas. Expenditures are allowed that establish cost-effective demand-side management services to promote energy efficiency and energy conservation; that advance science and technology through new research development and demonstration programs; that invest in renewable energy resources and technologies; and that provide services for low-income utility customers.

In 2001, the State of California was facing an electric supply crisis, and all citizens (and utilities) were asked to reduce electric usage. At the same time, municipal electric utilities realized that they must return monies collected from ratepayers under the Public Benefits Tax. Programs were created to provide incentives to Lompoc City Electric's 14,000 customers to increase electric conservation and decrease demand. To meet this goal, these programs provide rebates for residential customers to retrofit existing appliances.

## **Program Background**

Since 1997, the City has been using a small portion of collected Public Benefit Tax monies to provide payment relief for low-income customers. The Electric Rebate Program grants a yearly \$80 credit against City of Lompoc utility bills for income qualifying customers. Although the program provides short-term relief for low-income customers, it is a band-aid for solving high electric bills and does not give long-term relief to a segment of the population that can least afford to pay high bills; these customers continue to have difficulty paying their utility bills the rest of the year.

In 2001, a Refrigerator Rebate Program offering a \$120 rebate was created for customers who replace and recycle working pre-1992 refrigerators with new energy-efficient models. It soon became apparent that the \$120 rebate was not enough incentive to encourage low-to-moderate-income residents to purchase a new refrigerator. Customers participating in the Electric Rebate Program and low-income customers concerned with high bills felt they could not afford a

new refrigerator. Therefore, the City sought a program that would service this segment of the customer base in a way that would be most beneficial and meaningful for them.

The City's goal was to provide a means by which income-qualifying customers could purchase a new refrigerator, reduce their electric bill, and remove the old high-usage models from the electric system. The City did not want a giveaway refrigerator program, but wanted the customer to pick a refrigerator that met his or her needs, that required the customer to be partially responsible for the cost of the appliance, and that made the repayment affordable.

These goals led to the creation of the Refrigerator Replacement Program. Using the requirements of the Refrigerator Rebate Program, the City purchases a refrigerator costing up to \$570, and the customer repays the City \$240 in \$20 monthly installments for twelve months.

## **Program Structure**

To structure the program, the City referred to California Energy Efficiency Regulations for the Manufacture of Refrigerators. These regulations were first issued in January 1, 1987, and changed often before the current standards issued by the National Appliance Energy Conservation Act (NAECA) standard dated July 1, 2001, which is now the California standard. The 1992 standard created a 24% to 33% increase in efficiency over the previous standards, and the 2001 standard created another 30% increase in efficiency.

For example, standards created in 1987 and in effect until January 1, 1992, required a 18.79 cubic foot (freezer volume 4.92 + refrigerator volume 13.87) automatic defrost refrigerator without through-the-door icemaker to use a maximum of 1146 Kwh per year. The same style and size refrigerator manufactured after July 1, 2001, required a maximum usage of 497 Kwh per year, a savings of 649 Kwh per year, or a 56% increase in efficiency.

Most refrigerator replacement programs require the new refrigerator to be EnergyStar labeled as a guarantee that it is one of the most energy efficient models available. However, for approximately six months in 1991, EnergyStar requirements were suspended for refrigerator labeling. Since the City of Lompoc's program was established during that period of time, the City needed to create its own guidelines to ensure a substantial energy savings for each refrigerator replaced. Instead of requiring the new refrigerator to be EnergyStar labeled, the City created a formula for the maximum allowed electric usage of the new refrigerator using the EnergyGuide tag found on all refrigerators. The new refrigerator must use no more than the tag's average Kwh per year of the usage range. (The formula for this is: *Uses Least Energy* + *Uses Most Energy* ÷ 2.)

After EnergyStar labels were again applied to refrigerators and the program had been in place for about one year, the City reevaluated the usage requirement for the new refrigerator to determine if requiring the purchase of an EnergyStar labeled refrigerator would be more functional. Some customers and dealers were confused by the math required to calculate the maximum energy usage, causing extra staff time to explain the program to the customer. The reevaluation was also prompted by an increase in refrigerator purchase price and delivery charges.

The City found that, on average, the formula requirement realized a 4 Kwh per month additional savings, and fewer refrigerators were available at or under the \$570 limit. For the same reasons, the City did not require the purchase of an EnergyStar refrigerator in its place, since the extra savings was not a large enough customer benefit to warrant the extra expense of the refrigerator.

## Program Qualifications

Each Lompoc City Electric customer who qualifies for the existing Electric Rebate Program (an \$80 credit on utility bills) may be eligible for the Refrigerator Replacement Program.

To be eligible, applicants must meet income requirements; household income by household size must be below the median income levels established by HUD for Santa Barbara County. HUD median income levels are calculated using the Fair Market Rent area definitions. (This methodology can be viewed at the website <http://www.huduser.org/datasets/il.html>.) Table 1 shows income levels used for Lompoc's program.

**Table 1. Qualifying Income According to Household Size**

Household Size	Annual Income
1 person	\$36,250
2 people	\$41,400
3 people	\$46,600
4 people	\$51,750
5 people	\$55,900
6 people	\$60,050

If an applicant meets the income requirement, his or her existing refrigerator must be in working order, and, to ensure a substantial energy savings, it must be manufactured before 1992.

The City quickly found that most customers did not know the age of their old refrigerator, since many of the refrigerators were purchased used or given as a hand-me-down. With the help of an appliance repairperson, the City was able to obtain the necessary dating information from appliance manufacturers, who use the appliance's serial number to encode the year. The serial number is located on a metal tag usually on the front bottom edge of the refrigerator box, or is located on the inside of the refrigerator box after the vegetable and/or meat drawers are removed. The model number also is found on this tag. The problem lies in identifying the manufacturer; for example, Kenmore refrigerators may be made by Amana, Frigidaire, GE, Whirlpool, or Sanyo, and each use a different serial number coding to identify the year.

The website <http://www.homeenergy.org> (click on Do-It-Yourself/ Refrigeration/Data For Refrigerator models and their Energy Ratings) sometimes can be used to date refrigerators by brand and model number. Utility billing history can be useful to determine if the electric usage is high enough to indicate a pre-1992 refrigerator. The City also can lend the customer a LineLogger to test the refrigerator's energy usage to determine if the refrigerator uses more electricity than a 1992 model or later. The LineLogger is plugged into any outlet and the refrigerator is plugged into the Linelogger for three to five days. (The monthly usage is determined by the following formula:  $Kwh\ read \div the\ number\ of\ monitored\ days \times 30$ .) This device is useful to help customers determine what portion of the bill is used for refrigeration, and to help them decide if they want to replace the old appliance. If none of these methods can be used, an educated guess can be made from the color and the inside trim.

## **Application Process**

Each applicant must maintain an active utility account at the address where the new refrigerator will be installed. The new refrigerator must replace the refrigerator in use in the applicant's kitchen. Landlords cannot participate in the program to purchase a new refrigerator that will stay in the rental unit when the current tenant moves; however, to enable a tenant to participate in the program, the landlord may 'give' the old refrigerator to the tenant for replacement.

In order to ensure that a renter is not recycling the landlord's refrigerator, the City requires that the applicant proves ownership of the current refrigerator, or shows that the property owner knows the old refrigerator will be recycled at the landfill and the new refrigerator will belong to the customer. Ownership can be established with a rental agreement stating that the tenant must provide his or her own refrigerator.

Each applicant will receive a site visit from City staff to verify the age of the old refrigerator, verify total household income, and verify ownership of the refrigerator. At this time the Refrigerator Replacement Program Agreement is checked for completeness and the requirements of the program are discussed with the applicant. It is emphasized that the applicant will repay to the City \$20 per month for one year, that the refrigerator is the personal property of the applicant, and that the refrigerator must remain in the applicant's residence for a period of two years. If the applicant moves from Lompoc's service territory before the \$240 is repaid, the remaining balance is added to the customer's closing utility bill.

If all is in order and the customer understands the terms of the Agreement, the staff member will issue the customer a voucher for \$570 to be redeemed at a participating appliance dealer. The customer also is given a disposal slip identifying the make, model, and serial number of the old refrigerator. The dealer will not be paid for the new refrigerator until the Electric Department receives the signed disposal slip from the landfill staff verifying that the old refrigerator has been received at a recycling area.

It is the customer's responsibility to select the appliance dealer, the brand, the size, and the style of his or her refrigerator. The City does not involve itself with the purchase of the new refrigerator from the time the customer is given the voucher until the dealer invoices the City. If the customer chooses a refrigerator costing more than \$570 (including delivery and installation of the new refrigerator and removal and disposal of the old refrigerator), the customer will pay the difference to the dealer. Five hundred seventy dollars will allow the customer the purchase of a white, top-freezer refrigerator up to 19 cubic feet in size.

It is the dealer's responsibility to work with the customer to choose a satisfactory refrigerator, to deliver and install it, and to remove and dispose of the old refrigerator at the City Landfill.

## **Customer Payback**

Once the refrigerator has been delivered, the City will wait one full billing cycle for repayment to start; this way the customer can use utility bill savings for repayment. After the \$240 is repaid to the City, the account is closed and the customer is mailed the original invoice for the purchase of the refrigerator. In the event the customer becomes four months in arrears (\$80) in repayment, the City has the right to take possession of the replacement refrigerator and the customer will relinquish rights to all previous payments. If the applicant moves from

Lompoc's service territory before the \$240 is repaid, the remaining balance is added to the customer's closing utility bill.

Four times a month the Electric Department receives a printout of customers behind in repayment. The department sends a letter stating the repayment terms of the Agreement and the City's right to take possession of the new refrigerator if they fall four months (\$80) in arrears. If the customer does not respond, the department attempts a follow-up telephone call. If payment is not made within an agreed-upon time, the amount due is added to the customer's utility bill, which serves two purposes: either the customer makes arrangements for installment payments, or the unpaid amount is sent to a collection agency.

Most customers make regular payments, and some repay the total amount upon receipt of the first bill. Since the customer's payment history is not checked before approval to participate in the program, the Electric Department does risk a high non-payment of these accounts. Because the idea of the program is to lower utility bills, the City hopes that the more affordable bills will keep the incidence of non-payment low.

## **Customer Savings**

To determine how successful this program has been in lowering utility bills, a random sample of 50 billing account histories of customers participating in the Refrigerator Replacement Program was compared to 50 billing accounts of customers participating in the Refrigerator Rebate Program. Table 2 shows the Kwhs saved the first year after the refrigerator was replaced as compared to electric usage for the previous twelve-month period.

**Table 2. Refrigerator Replacement Savings**

<b>Program Title</b>	<b>Replacement Program</b>	<b>Rebate Program</b>
Total Kwhs saved per month	3314	3562
Average Kwhs saved per account per month	66.28	71.24
Average \$ saved per account per month	7.99	8.59

On average, rebate recipients realized a larger savings than replacement program customers. The same number of customers, ten in each group, saved more than 100Kwh per month after the replacement, but the refrigerator rebate group had three customers who saved more than 200 Kwh per month while the refrigerator replacement group had none.

In general, rebate customers ask more questions about why their bill is high and what they can do to reduce their bill, and they have more money to perform other energy efficiency measures. Rebate customers often have a second or even third refrigerator in service, and they participate in the City's program that pays the customer to recycle those refrigerators and/or freezers. The replacement program customers often do not own their refrigerator, or own one that they received or bought second-hand but it does not meet their needs. They may be more interested in owning their own refrigerator or owning a refrigerator that meets their needs, rather than in energy conservation.

## **Conclusion**

As with all programs, there are surprises and there are rewards. The City's biggest surprise was how fast the program became known and how many customers have participated.

As of January 1, 2004, 432 of the City's approximately 12,000 residential electric customers have purchased energy efficient refrigerators in this replacement program. Since City staff estimated that 250 customers would participate in the program, \$142,500 was dedicated from our Public Benefit Funds. By August 2002 the program was out of funds and staff requested an additional \$142,500. Staff estimates that these funds will be expended within two months and additional funds will need to be requested for this program.

Initially, participants heard about the program from appliances dealers and from City staff. Now most customers hear about the program from friends and neighbors who have previously purchased new refrigerators through the program. Word-of-mouth information seems to be particularly prevalent within the Spanish speaking community, in mobile home parks, and in apartment complexes.

The program has had an impact by significantly and permanently reducing electric usage and by reaching out to customers who fall through the cracks. These are customers who can least afford to spend money to reduce utility bills, who often have very high bills, and who can least afford to participate in programs that will help reduce bills. By structuring a program that meets the needs of this segment of the population, Lompoc City Electric Department will truly have reached the unreachable.

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