REPORT TO THE GOVERNOR AND LEGISLATURE: CORNER STORE ENERGY EFFICIENCY

INCREASING THE UPTAKE OF ENERGY EFFICIENT REFRIGERATION IN CORNER STORES

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EXECUTIVE SUMMARY

This report complies with the request from the Legislature in Assembly Bill 97 (2017) to provide recommendations on how to increase the uptake of energy efficient refrigeration equipment in corner stores in San Francisco County and Los Angeles County. In particular, the Legislature requested that the CPUC consider corner stores in low-income communities that wish to provide healthy food products. Through this work, two categories of barriers to this stated goal were identified. The first barrier, which we call the demand barrier, is that the cost of newer, energy efficient refrigeration is prohibitive to the large majority of corner store owners. The second barrier, which we call the supply barrier, is the over-abundance of older, used, and inefficient refrigeration equipment. We provide the following three recommendations to overcome these two barriers:

1) Increase current refrigeration rebate amounts for small businesses like corner stores in order to incentivize them to buy newer equipment.
2) Establish a maintenance education campaign to show the financial benefits of proper maintenance.
3) Establish a program for recycling used refrigeration equipment in order to change the corner store refrigeration fleet energy efficiency over time.

While this report provides the requested recommendations on increasing energy efficiency in corner stores, this alone will not address the goal of increased access to healthy foods.

Support for and expansion of healthy food programs such as Healthy Retail SF and the Healthy Neighborhood Market Network could help work towards both goals. From the energy use data we analyzed, there has been a steady decline in electricity consumption in stores that are involved in the Healthy Retail SF program. We cannot say conclusively whether or not this is the result of the store conversion process or some other mechanism, but even Healthy Retail SF

participating stores that have not participated in energy efficiency programs have, on average, seen a decline in their energy consumption. Additionally, these stores have all helped to increase access to healthy foods in low-income communities that would not have it otherwise.

This report is a useful starting point for examining the complexities of corner store energy efficiency and healthy food access in those communities that most need it. In addition to our recommendations, the primary contributions of this report are a useful definition of "corner store" and a new methodology for estimating the number of corner stores in a given geography.

INTRODUCTION

The California Public Utilities Commission (CPUC) has been tasked with providing the Legislature this report examining ways in which the percentage of corner stores using energy efficient refrigeration technology can be increased and providing recommendations towards this end. Assembly Bill (AB) 97 (2017) states:

> "Of the funds appropriated in Schedule (3), $107,000 shall be allocated to study the San Francisco and Los Angeles Counties' healthy food programs' use of energy efficiency programs, particularly for refrigeration measures. The Public Utilities Commission shall provide a report to the Legislature no later than July 1, 2019, with recommendations for increasing the percentage of corner stores using energy efficient refrigeration equipment, specifically considering corner stores in low-income communities that wish to provide healthy food products. The study may include metrics for evaluating the use of energy efficiency programs by corner stores and the efficacy of the San Francisco and Los Angeles Counties' programs in reducing corner store energy consumption."[1]

While the insights gained from this work are potentially applicable to corner stores more broadly, the present work is constrained geographically to the corner store sector in Los Angeles and San Francisco Counties, per AB 97. Additionally, we provide consideration for the subset of corner stores located in low-income communities[2] that wish to provide healthy food products. We understand energy efficient refrigeration technologies to be those technologies

[1] Section 2.00, Appropriation Item Number 8660-001-0462, Provision 3 of Assembly Bill 97 (2017)

[2] We follow the definition of "low-income community" provided in Section 1.38713 (d) of AB-1550, which states that "'Low-income communities' are census tracts with median household incomes at or below 80 percent of the statewide median income or with median household incomes at or below the threshold designated as low income by the Department of Housing and Community Development's list of state income limits adopted pursuant to Section 50093."

that are able to provide the same level of product cooling and display capabilities while using less energy than typical refrigeration equipment, which for the corner store sector generally means newer refrigeration equipment.

This report also studies the use of energy efficiency programs, particularly refrigeration measures, by healthy food programs in Los Angeles and San Francisco Counties. We have identified these healthy food programs as Healthy Retail SF in San Francisco County and the Healthy Neighborhood Market Network, a program of the Los Angeles Food Policy Council, in Los Angeles County. These programs, which will be discussed in more detail below, work with corner store owners in their respective geographies to help increase their healthy food offerings.

This report is in three sections. In section 1, we provide background information and outline the linkages between corner stores, food access, and energy efficiency. Specifically, we discuss:

1) What corner stores are and how they are defined.
2) Why they are important and how they function in urban foodscapes.
3) What relationship exists between energy efficiency and healthy food access.
4) What existing energy efficiency programs are applicable to the corner store sector.

In section 2, we describe our analysis and data and present our findings. We start with a description of the data used and how it was gathered. Next, we explain the methods used and the motivations for using these particular methods. We discuss the findings from our analysis.

In section 3, we provide recommendations for how to increase the use of energy efficient technologies in corner stores. We start with a discussion of

different possible refrigeration purchasing scenarios. We then provide a description of our process for developing possible recommendations, including the concept of the index of performance (IP) and our ranking methodology. Finally, we provide an in-depth discussion of our recommendations.

1. CORNER STORES, HEALTHY FOOD ACCESS, AND ENERGY EFFICIENCY

1.1 WHAT ARE CORNER STORES?

Determining what constitutes a "corner store" is a difficult task.[3] Reviewing the literature on interventions in corner stores yields a broad range of definitions. For example, corner stores have been defined by square footage;[4] number of aisles[5], number of employees[6], number of cash registers[7], type of food sold[8], and whether or not they are independently owned[9]. The difference between a corner store and a convenience store, if there is one, is unclear. Some authors equate them while others distinguish them by type of ownership (i.e. independently owned or corporate owned). In fact, corner stores are known by many names which vary considerably by location: convenience store, bodega, deli, mini-mart, and superette are just a sample of the many

[3] U.S. Department of Agriculture (2016), p. 10

[4] Borradaile et al. (2009); Gittelsohn, Rowan, and Gadhoke (2012)

[5] Laska et al. (2010); Borradaile et al. (2009); Lent et al. (2014)

[6] Borradaile et al. (2009); Gittelsohn, Rowan, and Gadhoke (2012)

[7] Ghirardelli, Quinn, and Foerster (2010); Borradaile et al. (2009); Lent et al. (2014)

[8] Borradaile et al. (2009); Kersten et al. (2012); Lent et al. (2014)

[9] Lent et al. (2014); Kersten et al. (2012); Gittelsohn, Rowan, and Gadhoke (2012); Azuma et al. (2010)

names used to refer to corner stores and all have been found in use in California through the course of the present work. Even the National Association of Convenience Stores (NACS) does not have a clear definition of what constitutes a corner or convenience store. Furthermore, as we found with this study, corner stores are found across a variety of North American Industry Classification System (NAICS) codes, making straightforward NAICS-based inquiries difficult if not impossible.

We provide a definition of corner stores that borrows from those offered in the literature and while potentially not capturing every business everyone would consider a corner store, will capture most. A corner store, as we define it:

1) Has a maximum of two cash registers open at any given time.
2) Does not sell gasoline.
3) Is located in a primarily residential area.
4) Sells a variety of general "convenience" items (such as snacks, candy, soft drinks, alcohol, prepared foods, and tobacco and sometimes household items like batteries, cleaning supplies, and stationery).
5) Is independently owned.
6) Is small (typically less than 3,000 square feet).
7) Has a small number of employees (typically less than 5).

We split the above criteria for defining corner stores into two groups which we call primary and secondary criteria. Primary criteria are those that cannot be violated. If they are violated, a business can no longer be categorized as a corner store. Secondary characteristics are those that are likely to hold but which a business can violate and still be considered a corner store. Criteria (1) through (4) are primary criteria while (5) through (7) are secondary criteria. In other words, (1) through (4) are necessary but insufficient criteria for being a

corner store and (5) through (7) are likely but unnecessary features of a corner store.

In developing a clearer picture of the corner store sector, it is helpful to look at examples of what are and are not corner stores. Large supermarkets, produce stores, gas stations, meat markets, small ethnic grocery stores, and smoke shops are examples of businesses that share some features of corner stores as we have defined them but that violate at least one of the primary features and would thus not be considered corner stores. For example, supermarkets are too large, both in square footage, number of cash registers, and number of employees, to be considered corner stores and they sell a variety of items well beyond convenience items, violating criteria (1) and (4). Likewise, a store that offers the same goods as a corner store but was located in an airport would not be a corner store because it violates criteria (3). In this report, we are focusing on independently-owned corner stores, though our recommendations will likely be effective for many similar businesses, such as small ethnic grocery stores, gas stations, and chain corner stores like 7-11 and Circle K.

1.2 WHY DO CORNER STORES MATTER?

According to the Centers for Disease Control, between 20% and 30% of Californians in 2016 suffered from obesity, defined as having a body mass index greater than or equal to 30%.[10] Obesity is associated with increased risks of hypertension, type 2 diabetes, coronary heart disease, stroke, osteoarthritis, and respiratory problems as well as several cancers.[11] Given that obesity is not randomly distributed throughout the population, with low-income, minority, and

[10] Centers for Disease Control (2018)

[11] National Institutes of Health (1998)

less educated Americans showing a higher rate of obesity than other groups[12], research starting in the early 2000s began to suggest that environmental factors drive obesity. For example, Morland et al.[13] found that neighborhoods with more supermarkets (and consequently more access to healthier foods) consumed more fruits and vegetables and that access to healthier foods is differentiated by race and income[14]. This line of research spurred the development of the healthy foods movement, which emphasizes the role that environmental factors play in food choice and thus obesity. A subset of the healthy foods movement are healthy corner store initiatives.

Corner stores have been targeted due to their role in urban and rural food environments. In many urban areas, and especially those with a large proportion of low-income or minority residents, corner stores are a primary source of food.[15] While the term "food desert" has become synonymous with these urban areas, a more appropriate accepted term has become "food swamp" as there is food, but this food is calorie dense and nutrition poor and inundates healthy food choices.[16] Healthy corner store programs have been proposed to help increase access to healthy foods like fresh fruits and vegetables by modifying existing corner stores to offer better foods. This Report focuses on two such healthy corner store programs: Healthy Retail SF and Healthy Neighborhood Markets Network.

1.2.1 HEALTHY FOOD PROGRAMS

[12] Ogden et al. (2015)

[13] Morland et al. (2002)

[14] Morland, Wing, and Rouz (2002)

[15] Borradaile et al. (2009)

[16] Cooksey-Stowers, Schwartz, and Brownell (2017)

1.2.1.1 HEALTHY RETAIL SF

Healthy Retail SF is a healthy corner store program enacted in 2013 by San Francisco County Supervisor Eric Mar that was spurred on by grassroots activism in San Francisco, particularly the Tenderloin Healthy Corner Store Coalition. Housed in the Office of Workforce and Economic Development (OEWD) and operated in conjunction with the San Francisco Department of Public Health (SFDPH), Healthy Retail SF has worked to define healthy retail. The program works with participating stores to produce a "13-page Individualized Development Plan that outlines activities, timelines, persons responsible and budget in three areas: business operations, physical changes to the store, and community engagement and marketing."[17]

The store conversion process starts with outreach to local merchants to inform them of the Healthy Retail SF program. Next, an assessment is made of participating business' specific needs through an examination of their finances, merchandising, food offerings, and operations. The IDP is then developed in conjunction with the business, an agreement between Healthy Retail SF and the business is signed, and conversion implementation begins. The final part of the conversion process is an evaluation of the implementation of the IDP performed through quarterly visits to the store by a consultant. To date, there have been approximately 11 stores converted in San Francisco.

1.2.1.2 HEALTHY NEIGHBORHOOD MARKETS NETWORK

The Los Angeles Food Policy Council (LAFPC), created by Los Angeles Mayor Antonio Villaraigosa in 2011, is a collective impact initiative that has the stated goals of reducing hunger, improving public health, increasing equity, creating quality jobs, stimulating local economic activity, and fostering environmental

[17] Healthy Retail SF (n.d.)

stewardship.[18] Unlike many city or county initiatives, food policy councils aim to incorporate the views and needs of stakeholders from the entirety of the food system, including farmers, distributors, chefs, and store owners, among others, and coordinate across different scales and departments in order to be effective in achieving their stated goals.

The Healthy Neighborhood Market Network is a corner store program conceived and implemented by the LAFPC that helps corner stores transition from being primary contributors to Los Angeles' food swamps to healthy foods retailers. Its participants are primarily small business owners, many of them immigrants, operating in under-served communities in Los Angeles. Healthy Neighborhood Market Network offers a number of free services to store owners, including skills building, leadership development, and business planning. Some of the training areas offered are store design and layout, accounting and bookkeeping, marketing, and energy efficiency, among several others.[19]

In 2017, Heathy Neighborhood Market Network interacted with 68 small businesses. Twenty-eight of these stores participated in store conversions. Four stores underwent a complete transformation with new layouts, paint jobs, signage, and refrigeration with the help of financing by FreshWorks, support from the City and County of Los Angeles, and design work by LA Más.[20]

1.3 ENERGY EFFICIENCY AND CORNER STORES

While there are many energy efficiency programs in the State of California that are technically applicable to corner stores, there are several clear challenges to increasing energy efficiency in corner stores. In this section, we discuss these

[18] Los Angeles Food Policy Council (2018)

[19] Los Angeles Food Policy Council (2014)

[20] Los Angeles Food Policy Council (2017)

energy efficiency programs, ending with a discussion of known challenges to participation in energy efficiency programs by corner stores.

1.3.1 APPLICABLE ENERGY EFFICIENCY PROGRAMS

1.3.1.1 PACIFIC GAS AND ELECTRIC

Pacific Gas and Electric (PG&E), which services San Francisco County among others, has a number of energy efficiency programs applicable to corner stores, though only one of them, EnergySmart Grocer, focuses on refrigeration. The primary mechanism through which PG&E incentivizes energy efficiency improvements in the grocery sector is through on-bill financing coupled with rebates. Businesses are allowed to borrow up to $100,000 interest-free for energy efficiency improvements under the conditions that they: 1) have been operating for at least 24 months, 2) are in good standing, 3) can pay the entirety of the loan in 60 months, and 4) are making improvements in equipment that are eligible for PG&E's rebate program. The EnergySmart Grocer program is only applicable to large- to medium-sized grocers with a peak demand greater than 70 kW.[21]

Additionally, there is the Energy Watch (formerly Energy Fitness) program that PG&E contracted with Richard Heath and Associates to administer. Energy Watch is a service for small- and medium-sized businesses that provides a full on-site assessment of the businesses facilities and identifies and installs applicable energy efficiency measures. Finally, there is the PG&E local government partnership with the City and County of San Francisco, SF Energy Watch. SF Energy Watch has two programs applicable to small businesses like corner stores. Commercial Plus is a program that works with small businesses to improve energy efficiency through low-cost improvements to lighting, refrigeration, and

[21] Energy Smart Grocer (2015)

air conditioning. The Small Business Direct Install program provides support services for small businesses and nonprofits from facility assessment to installation for energy efficiency upgrades and includes refrigeration controls.[22]

1.3.1.2 SOUTHERN CALIFORNIA EDISON

For Southern California Edison (SCE), which services most of Los Angeles County, the primary energy efficiency program for businesses is Energy Efficient Express Solutions, which all businesses in the commercial, industrial, agricultural, or nonprofit sectors in SCE's service area are eligible for. To qualify for the incentives under this program, all new equipment must exceed mandated codes or industry standard practices, use less wattage if replacing older equipment, be fully installed and operational, and remain at the site of the active SCE account. Through the Energy Efficient Express Solutions program, eligible businesses are paid on a per-unit basis up to 100% of the cost of new high efficiency equipment, including refrigeration.[23] Like PG&E, SCE also offers on-bill financing options with zero interest loans up to $100,000 that must be repaid within 60 months.[24]

1.3.1.3 LOS ANGELES DEPARTMENT OF WATER AND POWER

The Los Angeles Department of Water and Power (LADWP), the primary electricity provider for much of the City of Los Angeles, runs several energy efficiency programs in their service area. LADWP as a publicly-owned utility is not under the jurisdiction of the CPUC. LADWP provides electric service to some stores participating in the Heathy Neighborhood Market Network. The most directly applicable program for corner store owners that LADWP offers, in

[22] SF Environment (2017)

[23] Southern California Edison (2017a)

[24] Southern California Edison (2017b)

partnership with SoCal Gas, is the Food Service Program. The Food Service Program provides financial incentives for "ovens, griddles, steam cookers, holding cabinets, glass and solid door refrigerators/freezers, ice makers, and kitchen demand ventilation controls"[25] that meet required energy efficiency standards. Business owners interested in a rebate must purchase the equipment and be registered as a commercial customer with LADWP. The rebate amount per unit and list of qualifying equipment is available from LADWP. Additionally, there is no guarantee that a rebate will be granted as funds are only supplied until they are exhausted, and the program can end at any time.

1.3.2 OTHER RELEVANT STATE POLICIES AND PROGRAMS

There are at least two policies that are applicable to improving the percentage of corner stores using energy efficient refrigeration equipment. The first of these is the California FreshWorks Fund (FreshWorks). FreshWorks is "a public-private financing program that invests in grocery stores and other forms of healthy food retail and distribution in underserved communities."[26] Partners include the California Grocers Association, JPMorgan Chase, and the California Endowment, among others. FreshWorks is a program that has several linkages with the goals of this report. For example, the four corner stores converted into healthy food retailers by Healthy Neighborhood Market Network received part of their funding from FreshWorks.

Another program is the California Healthy Food Financing Initiative (CHFFI) that was established by AB 581 in 2011. CHFFI is also a public-private partnership "created to increase access to healthy foods in underserved, urban, and rural

[25] Los Angeles Department of Water and Power (2018)

[26] CA Freshworks (2018)

communities and inspire innovation in healthy food retailing."[27] This initiative was designed to use California's already existing resources to combat food deserts.[28] However, it is not clear whether this has had any meaningful impact to date, as the council associated with CHFFI has not met since 2013[29] due to lack of funding.

1.3.3 CORNER STORES AND KNOWN CHALLENGES TO ENERGY EFFICIENCY PROGRAM PARTICIPATION

There are unique challenges that have prevented various utility and state programs, including energy efficiency programs, from reaching the corner store sector. A recent study of the grocery sector[30] argues that low profit margins of 1% to 3% and the complexity of refrigeration systems act as barriers to participation by this sector in energy efficiency programs. Additionally, this study found that uncertainty in the loan process and the processing timeline for on-bill financing initiatives, such as those offered through EnergySmart Grocer, make store owners reluctant to participate.

Corner stores meet the CPUC's definition of a hard-to-reach business, as outlined in Decision (D.)18-05-041. According to D.18-05-041, hard-to-reach businesses are those that satisfy three of the following criteria (or two criteria if one of the criteria is the geographic criteria):

1) The language criterion, in which the primary language spoken is not English.

[27] California State Treasurer (2018)

[28] California Department of Food and Agriculture (2011)

[29] ibid

[30] Geers et al. (2014)

2) The geographic criterion, in which a business exists in areas outside of the Los Angeles, San Francisco, San Diego, or Sacramento metropolitan statistical areas.

3) The size criterion, in which a business has fewer than 10 employees (or has annual electric demand less than 20 kW or annual gas consumption less than 10,000 therms).

4) The facility criterion, in which the facility that would be improved through energy efficiency programs is rented or leased by the business owner.

Many, if not most, corner stores satisfy the language, size, and facility criteria, as we show below in section 2.

Researchers from the University of California Los Angeles, found that corner store owners were often distrustful of interventions generally while also being concerned with the loss of revenues these interventions could bring about.[31] Research consultants with the Cadmus Group found that owners of businesses in the Michigan independent food industry, including restaurants, grocery stores, and convenience stores, are distrustful of government intervention and rely on face-to-face interactions and social networks for information.[32] Finally, researchers from Johns Hopkins University found that Korean American store owners in Baltimore viewed disruptions to their business as a barrier to intervention (in their case, converting corner stores to healthy food retailers).[33]

As can be seen from the above information, PG&E, SCE, and LADWP all have energy efficiency programs that are applicable to corner stores. However, given the current discussion, it is evident that these incentives might be unlikely to

[31] Ortega et al. (2015)

[32] West and Dethman (2012)

[33] Song et al. (2010)

sway corner store owners to participate in energy efficiency programs. For example, with SCE's Energy Efficient Express Solutions program, store owners must front the cost for equipment upgrades and apply for a rebate. We address these issues in more depth in our discussion in section 3.6. In section 3 we examine what barriers exist for the uptake of energy efficient refrigeration equipment by corner store owners in more detail through a discussion of our analysis and findings. We find that there are both demand barriers and supply barriers that must be addressed in order to increase the uptake of energy efficient refrigeration equipment in the corner store sector.

2. ANALYSIS AND FINDINGS

In this section, we describe the types of data gathered, datasets utilized, and the methodology used to analyze this data in order to:

1) Estimate of the number of corner stores in Los Angeles County and San Francisco County
2) Understand the spatial distribution of corner stores, especially as it relates to poverty
3) Understand the energy use patterns of corner stores, including their energy consumption and participation in energy efficiency programs
4) Understand the barriers faced by corner store owners regarding the purchase of energy efficient refrigeration equipment

2.1 DATA

We have relied on a wide variety of data for this report, including health inspection, spatial, energy use, interview, and survey data. Each data type provides insight into some aspect of the corner store sector. The publicly available health inspection data contains the set of all corner stores while

spatial data allows us to see what phenomena corner stores are co-located with. Energy use data provides a means to discuss sector-wide energy use and explore patterns of energy consumption. Interview data from corner store owners and subject matter experts informed our later analysis. Survey data helped us gain insights into the barriers faced by corner stores owners regarding the purchase of energy efficient refrigeration equipment and participation in energy efficiency programs. In this subsection, we describe the data used and how it was gathered.

2.1.1 HEALTH INSPECTION DATA

According to Section 113948(d)(1) of the California Food Retail Code (SB-144), convenience stores are considered grocery stores and consequently receive health inspections at least once a year. Therefore, though there is no agreed upon definition of a corner store, the entire set of corner stores in Los Angeles and San Francisco Counties are contained within their respective health inspection data sets. The observations in the data set are inspections, not businesses, so we filtered the data to only include unique businesses. We then took random samples of n = 1,000 unique health inspected businesses and manually coded each business as "1" if that business was a corner store or "0" if not after performing an in-depth internet search of the business. Due to the size of Los Angeles County, we split the Los Angeles health inspection data into the City of Los Angeles and the County of Los Angeles excluding the City of Los Angeles. In addition to the health inspection score, the data provide identifying variables such as address, owner, and inspection date, among others.

The coding was validated by taking a small sample of health inspected businesses and having them coded as corner store or non-corner store by five different, independent coders and calculating the Fleiss' kappa, a measure of

inter-rater reliability, for the codes (see APPENDIX C). We found a Fleiss' kappa of 0.64, considered substantial agreement.[34]

Due to the sampling and coding methodology used, the businesses coded as corner stores act as a random sample of the population of corner stores. We can therefore infer from features of this sample of corner store estimates of population characteristics, such as energy use and surrounding poverty level. The small percentage of health inspected businesses that were corner stores required that we perform this method more than once to yield a reasonably sized sample (i.e. greater than n = 30) for both Los Angeles County and San Francisco County. Two rounds of sampling and coding yielded a corner store sample of n = 39 for San Francisco County and n = 82 for Los Angeles County.

2.1.2 SPATIAL DATA

For the geographic information system (GIS) analysis, we relied heavily on publicly available shapefile and demographic data from the United States Census Bureau. Specifically, we used 2010 American Community Survey (ACS) 5-year Estimates by census tract and 2017 United States Census Bureau census tract shapefiles. The 2010 ACS was used as this is the official record of the decennial survey.

We also geocoded (i.e. assigned latitude and longitude to) the businesses in the health inspection data to map corner stores against poverty. A review of the literature suggested that corner stores are more concentrated in areas with higher levels of poverty. We used this insight as a form of code validation for our coding of health inspected businesses as corner stores.

2.1.3 INVESTOR-OWNED UTILITY ENERGY USE DATA

[34] Landis and Koch (1977)

From Pacific Gas and Electric (PG&E), we received monthly energy consumption data for the period January 2015 to December 2017 for the 39[35] stores from our random sample of health inspection data that had been coded as independent corner stores in the City and County of San Francisco. This data also included information on whether the businesses participated in energy efficiency programs, monthly peak demand, how long they have been owned by the same owner, and their North American Industry Classification System (NAICS) code (see APPENDIX E).

From Southern California Edison, we received monthly energy consumption data for the period January 2015 to December 2017 for the 82[36] stores from our random sample of health inspection data that had been coded as independent corner stores. This data also included information on whether the businesses participated in energy efficiency programs, monthly peak demand, how long they have been owned by the same owner, and their North American Industry Classification System (NAICS) code. As discussed above, we were unable to get energy consumption data for the City of Los Angeles due to jurisdictional boundaries (see APPENDIX E).

2.1.4 SURVEY DATA

We designed and administered a 20-question survey (APPENDIX A) to a convenience sample of stores in Los Angeles and San Francisco. A convenience sample is a non-probability sampling method in which the sample inclusion criterion is the researcher's access to the subject of study. This data includes

[35] 39 is the number of businesses coded as "corner store" in two samples of n = 1000 from the San Francisco health inspection data. Some stores appeared in both samples and some could not be found in the energy use data.

[36] 82 is the number of businesses coded as "corner store" in two samples of n = 1000 from the Los Angeles County health inspection data. Some stores appeared in both samples and some could not be found in the energy data.

information on features of the corner store, such as how long the business has been in business, the number of cash registers, number of employees, and square footage of the store, as well as information on store owners' willingness-to-pay for refrigeration equipment and preferred payback period if they were to buy new refrigeration equipment. Due to the indefinite nature of the corner store sector and a lack of knowledge of the features of the population of stores, no claim to representativeness can be had from any sampling methodology regardless of sample size. Therefore, the results of the survey cannot be generalized to the population of corner stores. However, the survey is helpful as a pilot study that assesses the plausibility of claims in the literature and also provides preliminary insights into the corner store sector.

2.2 METHODS AND FINDINGS

2.2.1 DESCRIBING CORNER STORES AS A SECTOR

2.2.1.1 ESTIMATING NUMBER OF CORNER STORES IN LOS ANGELES AND SAN FRANCISCO COUNTIES

Estimating the number of corner stores in Los Angeles and San Francisco Counties allows us to understand the size of the corner store market and estimate sector-wide energy use. As discussed above, there is no clear or widely agreed upon definition of what constitutes a corner store so to estimate the number of corner stores we performed the sampling and coding of health inspection data described in section 2.1.1 that yielded our corner store samples. Businesses coded as "corner store" were further coded as "chain store" or "not chain store," with chain corner stores being excluded from our analysis due to the very different business model of franchised chain corner stores.

Using Wald-type confidence intervals at a 95% confidence level, we estimate that the proportion of health inspected businesses that are independently-owned corner stores is between 6% and 9% for the City of Los Angeles and 5%

and 8% for the County of Los Angeles (excluding the City of Los Angeles). The City and County of San Francisco are a single entity and are considerably smaller than even the City of Los Angeles, much less the County of Los Angeles. We estimate that the proportion of health inspected businesses in the City and County of San Francisco that are independently-owned corner stores, again at a 95% confidence level, is between 2% and 4%.

Within the Los Angeles County health inspection data, there were a total of 39,991 unique health inspected businesses, with 11,510 of these businesses located in the City of Los Angeles. In the City and County of San Francisco health inspection data, there were 6,023 unique businesses. Given these numbers, the proportion estimates above yield an estimate of the number of independently-owned corner stores in the City of Los Angeles in the high hundreds (between 630 and 1,000 stores) and in the thousands (between 1,300 and 2,200 stores) for the County of Los Angeles (again excluding the City of Los Angeles). The estimate of the number of independently-owned corner stores for the City and County of San Francisco is in the low hundreds (between 107 and 231 stores)

2.2.1.2 ESTIMATING ENERGY USE OF THE CORNER STORE SECTOR

To estimate the energy use of the corner store sector in Los Angeles and San Francisco Counties, we used data provided on the energy use of the stores in the corner stores samples by PG&E and SCE to compute the mean amount of energy used by corner stores in their respective service areas. We deemed the mean the most appropriate measure of central tendency in our study due to the desire to understand corner stores, in aggregate, as a sector. From our sample of randomly selected corner stores in San Francisco, we calculated a mean monthly electricity use of 5,310 kWh for these stores over the 3-year period from January 2015 to December 2017. This yields an estimated electricity use for

the corner store sector in San Francisco of anywhere between 568,000 kWh and 1.2 million kWh per month.[37]

For Los Angeles County, we were unable to get energy data for the City of Los Angeles as it is serviced primarily by Los Angeles Water and Power (LADWP), an entity that is not regulated by the CPUC. However, we were able to access energy use data for businesses in SCE's service area in other areas of Los Angeles County. From this, we computed a mean monthly energy use of 4,414 kWh for corner stores in Los Angeles County (excluding those in the City of Los Angeles) over the 3-year period from January 2015 to December 2017. When multiplied by the estimate of the number of corner stores in Los Angeles County, this yields an estimated energy use for the corner store sector in Los Angeles County of between 6 million and 9.8 million kWh per month.

Table 1 Corner Store Energy Consumption and Energy Efficiency Program Participation by Region

Region	Estimate of Number of Corner Stores	Mean Monthly Energy Consumption (in kWh)	Corner Stores Participating in Energy Efficiency Programs
Los Angeles County (excluding City of Los Angeles)	1,794 ± 429	4,414	32%
San Francisco County	169 ± 62	5,310	24%

2.2.1.3 SPATIAL ANALYSIS OF CORNER STORES

In order to understand the spatial distribution of corner stores, we geocoded the businesses in our sample of corner stores. After geocoding, we were able to

[37] This is calculated by multiplying the average energy consumption for independent corner stores by the estimated number of independent corner stores.

show what areas corner stores are more likely to be located in. As stated above, the literature on corner stores states that corner stores are located in areas with higher levels of poverty. To test this, we used 2010 U.S. Census Bureau data on poverty to create a choropleth map of poverty in California. We then mapped the businesses coded as corner stores over the choropleth map. The resulting maps can be seen in Figures 1 and 2.

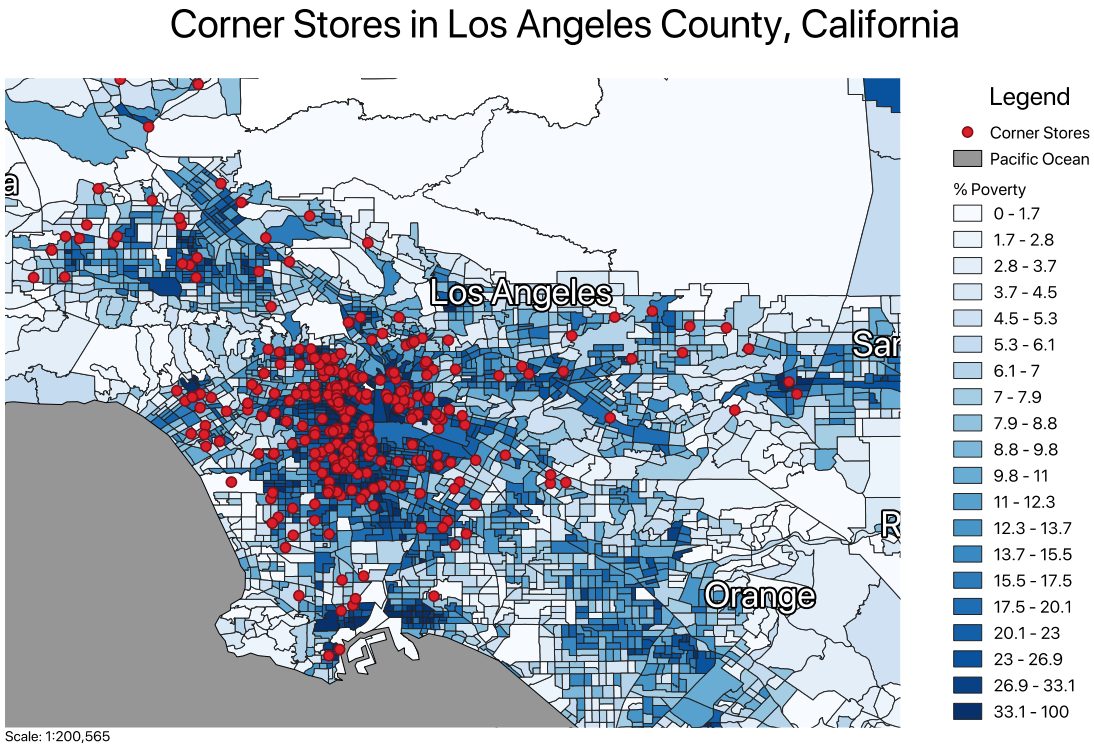

Figure 1 Choropleth map of Los Angeles County mapping corner stores against poverty

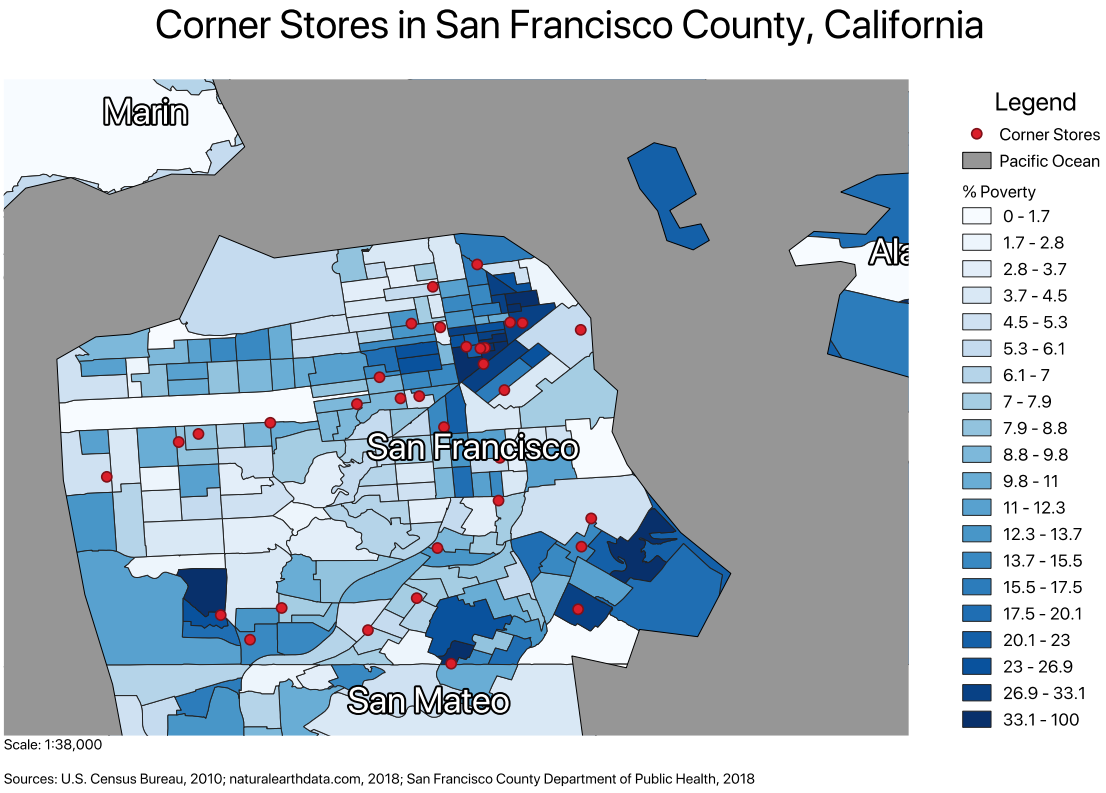

Figure 2 Choropleth map of San Francisco County mapping corner stores against poverty

A visual inspection of the maps suggests that corner stores are expected to be in areas with higher levels of poverty. To statistically test this, we combined the coded corner store data with 2016 American Community Survey 5-year estimates of poverty level by ZIP code. This data provides percentage estimates of poverty, defined as having income below the Federal poverty level for the 12 months prior to the survey, for all people in the ZIP code. We found that corner stores are more likely to be located in areas with higher poverty, as the literature suggested (see APPENDIX D).

2.2.2 CORNER STORE ENERGY DATA

2.2.2.1 DESCRIPTIVE STATISTICS

For San Francisco, our analysis focuses only on the sample of 38[38] corner stores that comprise our random sample of San Francisco County health inspection data. Table 2 summarizes energy consumption and other descriptive data of our San Francisco sample.

Table 2 Descriptive Data of San Francisco County Corner Store Sample

Descriptive Statistics	San Francisco County Data
Number of Stores in Sample	38
Median Monthly Energy Consumption	4,668 kWh
Mean Monthly Energy Consumption	5,310 kWh
Min Monthly Energy Consumption	*1,904 kWh*
Max Monthly Energy Consumption	*11,111 kWh*
Number of Stores That Participated in EE programs (%)	9 of 38 (23.7%)
Average length of time business had same owner	17 years

As discussed above, the use of NAICS codes to categorize businesses as corner stores or not is unreliable due to the wide range of NAICS codes used by these businesses. The distribution and description of NAICS codes among corner stores in San Francisco County can be found in Table 3.

Table 3 NAICS Code Count and Descriptions for San Francisco County

Count	NAICS Description
18	Supermarkets and other grocery excluding convenience stores
8	Beer, wine, and liquor stores
6	Grocery stores

[38] We removed stores that were four standard deviations or more away from the mean with the assumption that these are miscodes. There was one store four standard deviations from the mean.

Count	NAICS Description
3	Convenience stores excluding gas retailers
1	Food and beverage stores
1	Food services and drinking places

For Los Angeles County, our analysis focuses only on the sample of 82 corner stores that comprise our random sample of Los Angeles County health inspection data. Table 4 summarizes energy consumption and other descriptive data of our Los Angeles sample.

Table 4 Descriptive Data of Los Angeles County Corner Store Sample

Descriptive Statistics	Los Angeles County Data
Number of Stores in Sample	82
Median Monthly Energy Consumption	4,071 kWh
Mean Monthly Energy Consumption	4,414 kWh
Min Monthly Energy Consumption	*209 kWh*
Max Monthly Energy Consumption	*13,442 kWh*
Number of Stores That Participated in EE programs (%)	26 of 82 (31.7%)
Average length of time business had same owner	10 years

The distribution and description of NAICS codes among corner stores in Los Angeles County can be found in Table 5.

Table 5 NAICS Code Count and Descriptions for Los Angeles County

Count	NAICS Description
45	Beer, wine, and liquor stores
22	Convenience stores excluding gas retailers

4	Supermarkets and other grocery excluding convenience stores
3	Commercial building rental or leasing
2	Specialty food stores
2	Tobacco stores
1	Alcoholic beverage drinking places

2.2.2.2 ANALYSIS AND DISCUSSION

From our analysis of energy use data, there is not a significant difference in energy use among the different kinds of businesses coded as corner stores. That is, NAICS code is likely not a useful classifier for this sector as businesses that would be considered corner stores cut across NAICS codes. Any outreach or interventions operated via NAICS code are likely missing the large share of corner stores.

Regarding energy efficiency program participation, PG&E and SCE (or contracted third parties) have been relatively successful in getting corner stores to participate in energy efficiency programs, with 28.9% (35 out of 127 across both utilities) of the corner stores from our random sample participating. Additionally, the length of ownership of corner stores in San Francisco and Los Angeles Counties suggests that ownership turnover rates in Los Angeles County are higher than in San Francisco, meaning that some longer-term interventions that focus on corner store owner's individual decision-making might be less effective in Los Angeles County than San Francisco County due to the relative precariousness of businesses in the former.

2.2.3 SURVEY DATA

2.2.3.1 DESCRIPTION

Our 20-question survey (included in APPENDIX A) includes questions designed to solicit thresholds for rebate amounts, time frames for on-bill financing payback, and desire for offering healthier food options like fresh fruits and vegetables among corner store owners. Additionally, it includes questions that were designed to help define some features of corner stores, such as average square footage, age of refrigeration equipment, number of cash registers, length of ownership, refrigeration maintenance schedule, and language spoken by the store owner.

As mentioned above, this survey was administered to a convenience sample of 20 stores. That is, we followed no randomization process and administered the survey to those corner stores willing to speak with us. Corner store owners are an especially difficult group to reach. Over the course of this survey, we attempted several methods of reaching corner store owners.

- **Cold calls:** Calling was the least successful, with most stores declining to participate once we shared our goal of seeking information. For the stores that did not decline, we were only able to reach the store owner once.
- **Randomly visiting sites**: We also attempted to go to stores in person. However, this too was mostly unsuccessful though the response rate was higher than calling. We encountered difficulties that we, upon discussion with others working with this sector, found were common. For example, it is very challenging to reach the store's decision-maker, either because of their absence at the time of the visit or their desire to remain unknown. There were times where we had credible reason to believe that we were speaking with the store owner, but they would deny that this was true. Unsurprisingly, this makes the solicitation or sharing of information difficult.

- **Visits based on a shared contact**: We relied heavily on shared contacts to reach store owners due to the above difficulties. Because of the nature of these shared contacts, there are differences in some features of the survey sample relative to what one would expect of the population of corner stores. For example, at 50% (10 of our 20-store convenience sample), a much larger share of the corner stores surveyed already offered fresh fruits and vegetables than what would be expected from the literature. Additionally, 15% of store owners (3 of our 20-store convenience sample) own the buildings their store is in, a higher percentage than would be expected given property prices in San Francisco and Los Angeles Counties and the relatively low profit margins of corner stores. Lastly, more than half of stores surveyed have participated in energy efficiency programs (11 out of 20), much higher than the 20% to 30% estimated by the random samples of corner stores discussed in section 2.2.2.

However, many of our findings are in line with what one would expect after reviewing the literature on this sector and speaking with subject matter experts. Table 6 provide a summary of these findings.

Table 6 Data From Interviews with 20 Corner Stores

INTERVIEW QUESTIONS	Result of Interviews (n = 20)
Describing the Store	
Average length of ownership	13 years
Number of store owners that spoke more than one language	20
Average age of refrigeration equipment	14 years
Number of store owners that perform routine maintenance twice or more a year	15 out of 20 (75%)
Number of store owners that perform the maintenance themselves	5 out of 20 (25%)

INTERVIEW QUESTIONS	Result of Interviews (n = 20)
Average square footage of 20 stores that participated in interview	2,464 square feet
Maximum number of cash registers	2
Average number of cash registers	1
Average number of employees	3
Economic Factors	
Number of stores owners that purchased used refrigeration equipment (%)	15 out of 20 (75%)
Average cost estimate to replace refrigeration equipment with newer equipment	$23,000
Average willingness to pay for new refrigeration equipment	$7,600
Number of stores willing to invest in new refrigeration equipment	12
Of these 12, the number of store owners that would need to pay for a new refrigeration system in 5 years of less	*10 out of 12*
Number of stores interested in lowering their energy usage (%)	18 out of 20 (90%)

2.2.3.2 ANALYSIS AND DISCUSSION

Our goals with the survey were twofold. First, we wanted to trace some of the boundaries of the ill-defined corner store sector. Second, we hoped to understand the needs and desires of corner store owners regarding rebates, on-bill financing, and healthy food offerings. In this subsection, we discuss the important findings from the survey as they relate to the latter goal in the context of currently existing policy. We want to reiterate, however, that this survey is not generalizable and acts only as a pilot study. A larger survey would need to be

undertaken if there is interest to gain a more robust understanding of the corner store sector.

As shown above, the prevalence of used equipment in corner stores is striking. Furthermore, the average age of stores that had purchased new refrigeration equipment when they opened the store was 14 years, meaning that even if they did originally buy the equipment new it is likely now outdated and inefficient relative to current refrigeration technology standards. This finding has implications for the effectiveness of energy efficiency measures such as rebates and on-bill financing, which both apply to new equipment. This suggests that, even if designed and implemented perfectly, on-bill financing and rebates may have limited reach in this sector.

If the averaged responses on estimates of the cost of refrigeration equipment and willingness-to-pay for newer refrigeration equipment are treated as a ratio, it suggests that surveyed store owners, on average, are willing to pay 33% of the cost of new refrigeration equipment. While rebate amounts are contingent on the type of equipment being bought, current rebates offered by IOUs are nowhere near 66% of the cost of new refrigeration equipment, the implied rebate amount.

As discussed above, 10 out of 12 store owners in our convenience sample report they would need to pay for a new refrigeration system in less than 5 years for them to invest in a new refrigeration system. The on-bill financing loan payback period for both SCE and PG&E is limited to 5 years, meaning that any loans must be paid back in 60 months or less. To qualify, a business must be able to show that the savings gained from the equipment upgrade can pay for the cost of the equipment in 5 years or less. For a $45,000 loan[39] the monthly savings would

[39] This is a reasonable amount to pay for the purchase and installation of a new remote condensing unit, which can cost as much as $70,000

have to be $750 to qualify, an unlikely savings amount for a corner store[40]. The savings and payback period requirements of existing on-bill financing programs prevent most corner stores from participating.

The above analysis and discussion sheds light on why corner stores may purchase older, used, and less energy efficient refrigeration equipment and why, as things currently stand, they are unlikely to change these purchasing habits. In the next section, we discuss what policy interventions have the potential to increase the amount of newer, more energy efficient refrigeration equipment in corner stores.

3. RECOMMENDATIONS

In this section, we provide our recommendations on how to increase the uptake of energy efficient refrigeration equipment among corner stores by drawing on insights gained through our analysis and extensive discussions with subject matter experts and affected stakeholders. We start with a brief discussion of the motivations for corner store owners to buy refrigeration equipment. This helps to properly frame our recommendations and provide an understanding of the circumstances in which these recommendations will be most effective. Next, we present alternative candidate solutions for decreasing energy consumption in corner stores, the ultimate goal of increasing the uptake of energy efficient refrigeration equipment among corner stores. We then provide a description of the concept of indices of performance, the measures by which alternative candidate solutions are ranked, and the methodology used in ranking alternatives. Finally, following an in-depth discussion of the barriers to the uptake of energy efficient refrigeration equipment in corner stores as they relate to policy alternatives, we provide our final recommendations.

[40] This would be a 20% savings on a $3,750 bill

3.1 PURCHASING SCENARIOS: WHY WOULD A STORE OWNER PURCHASE REFRIGERATION EQUIPMENT?

Corner store owners, who purchase refrigeration equipment, are motivated by one of four purchasing scenarios. First, the store owner is opening a new store. Second, the store owner is expanding their store by increasing their offerings and require more refrigeration. Third, the store owner's current refrigeration equipment has broken down and needs to be replaced. Finally, the store owner's energy costs are too high and they are looking to replace their current refrigeration equipment with more energy efficient refrigeration.

From our investigation, the most common reason for store owners to buy new refrigeration equipment is because a constituent part of their current system has broken down. In addition to vendor-provided self-contained refrigeration units, many corner stores use remote condensing units which have three major components: a condenser, compressor, and cabinet(s). Because of this modular structure, if a part breaks it is not difficult to replace it with a new unit. However, the part must be compatible with the rest of the system, meaning that it must operate with an acceptable refrigerant and have the appropriate amount of power for the system. This compatibility issue makes it relatively easy and inexpensive to replace a constituent part of the refrigeration system but creates inertia regarding the purchase of a more energy efficient system. The store owners can continue to replace malfunctioning parts without ever updating their system to newer equipment until there is a complete breakdown of the system, which could take decades. Similarly, for the new store owner or the store owner looking to expand their offerings, used (and likely less energy efficient) refrigeration systems are an attractive option due to their lower short-term cost and their wide availability. The only group likely to invest in energy efficient refrigeration systems without outside intervention are those store owners whose energy costs are too high.

3.2 ALTERNATIVE CANDIDATE SOLUTIONS

As stated above, this report focuses on the goal of increasing the uptake of energy efficient refrigeration equipment in corner stores in Los Angeles and San Francisco Counties. We understand this goal to be motivated by a desire to reduce energy consumption in corner stores. As such, we propose several alternative candidate solutions ("alternatives") for achieving a reduction in energy consumption by corner stores through a consideration of how refrigeration equipment is procured and used by corner store owners as well current energy efficiency programs.

3.2.1 ALTERNATIVE 1: LABEL EQUIPMENT WITH TRUE COST OF OWNERSHIP

There is a large amount of variability in the true cost of ownership of refrigeration equipment. What is meant by true cost of ownership is the sticker price of the equipment in conjunction with all of the costs that are borne over the length of ownership of that equipment, such as energy costs, repair costs, and installation costs. Currently, there is no disclosure on the true cost of ownership of commercial refrigeration equipment. This has the effect of making used (and less energy efficient) refrigeration equipment more attractive due to the lower price tag when this equipment might cost more to own in the long run, an outcome that is suboptimal both for the store owner and for societal goals like a reduction in greenhouse gases. Therefore, a program could be developed to require the publication of the true cost of ownership on commercial refrigeration equipment.

3.2.2 ALTERNATIVE 2: PROVIDE ENERGY USE FEEDBACK

Most corner store owners are unaware of how much energy they are using at any given time and what equipment this energy use is coming from. Refrigeration equipment can account for up to 60% of the energy used in a

corner store.[41] Technology exists that monitors energy use in real-time and can provide feedback to store owners. This information can incentivize store owners to invest in energy efficient refrigeration equipment or make other adjustments to reduce their energy consumption.

3.2.3 ALTERNATIVE 3: RECYCLE USED REFRIGERATION EQUIPMENT

Because of the prevalence of corner store owners buying used and less energy efficient refrigeration equipment, it is currently difficult to increase the average energy efficiency of the fleet of refrigerators in this sector without addressing the supply of used refrigeration equipment. A program can be established to require the dismantling and recycling of refrigeration equipment beyond a certain age or using certain kinds of refrigerant that have now been banned. Over time, this will increase the average energy efficiency of the fleet of refrigerators.

3.2.4 ALTERNATIVE 4: MAINTENANCE EDUCATION CAMPAIGN

Routine maintenance of refrigeration equipment is a resource that is underutilized in the corner store sector. A lack of maintenance can vastly increase the amount of energy needed to cool products. A maintenance education campaign, if effective, could help reduce the energy consumption of corner stores regardless of the age of their equipment.

3.2.5 ALTERNATIVE 5: PURCHASE ENERGY EFFICIENT REFRIGERATION EQUIPMENT

A clear way of reducing energy consumption in the corner store sector would be to buy newer, energy efficient refrigeration equipment for the store owners.

[41] Southern California Edison (2013); Pacific Gas and Electric (2014)

This equipment would replace older, less energy efficient refrigeration equipment.

3.2.6 ALTERNATIVE 6: MODIFIED REBATE PROGRAM

Current refrigeration equipment rebate programs operated by PG&E and SCE do not specifically target corner stores. Consequently, they are not aligned with the needs of this sector, meaning that they are too small in value to entice corner store owners to buy newer, more energy efficient refrigeration equipment. These rebate amounts could be adjusted to properly reflect the needs of the corner store sector.

3.2.7 ALTERNATIVE 7: MODIFIED ON-BILL FINANCING PROGRAM

Current on-bill financing programs operated by IOUs do not specifically target corner stores. As such, they fail to meet the needs of corner store owners. On-bill financing relies on the assumption that the savings from newer, more energy efficient refrigeration equipment will be enough to pay for that equipment. However, for many corner store owners this is a dubious assumption. Furthermore, the payback period is longer than many corner store owners would be comfortable with. An on-bill financing program that takes into account the needs of more precarious small businesses can be designed to help get energy efficient refrigeration equipment into corner stores and reduce their energy consumption.

3.2.8 ALTERNATIVE 8: BUSINESS-AS-USUAL

The final alternative is to do nothing different from the status quo and operate business-as-usual.

3.3 INDICES OF PERFORMANCE

An Index of Performance (IP)[42] is a measure by which one assesses the performance of alternatives in achieving a desired goal. We rank the alternatives provided above using three IPs: Cost, Implementability, and Effectiveness (Table 7).

Table 7 Indices of Performance and Description

Index of Performance	Description
Cost	The monetary cost of an alternative
Implementability	The ease in implementing an alternative
Effectiveness	How effective an alternative is in reducing energy consumption among corner stores

Effectiveness and Implementability are IPs that should be maximized while Cost should be minimized.

3.4 RANKING METHODOLOGY

To rank the alternatives, we asked several subject matter experts, independently of one another, to give each alternative a score from 1 to 10 for each of the IPs. These scores were then averaged. This score is a reflection of how the alternative compares to the other alternatives on this particular IP. Additionally, each IP is assigned a weight that reflects the importance of this particular IP to a decision-maker, in this case California State legislators. For this analysis, the weights for the IPs are set at -1:1:1, for Cost, Implementability, and Effectiveness, respectively. Each alternative receives a score that is equivalent to the weighted average of its performance across the IPs. The alternatives are then

[42] Gibson, Scherer, and Gibson (2007)

ranked by score, highest to lowest with higher scores being better. [43] The results of this methodology are found below in Table 5.

3.5 RANKING RESULTS

The results of the alternatives ranking using the methodology described in section 3.3 are shown below (Table 8).

Table 8 Rankings of Policy Alternatives

Alternative	Cost	Implementability	Effectiveness	Score	Rank
Recycling Program for Older Refrigeration	-6.3	6.7	8.0	14.0	1
Modified Rebate Program	-5.7	7.0	6.7	13.3	2
Feedback on Energy Use	-5.3	6.3	6.7	12.8	3
True Cost of Ownership Labeling	-5.7	5.3	7.0	11.0	4
Modified On-bill Financing Program	-2.7	4.3	4.7	10.5	5
Maintenance Education Campaign	-6.7	6.0	6.3	9.3	6
Business-as-usual	-7.0	5.7	4.0	4.5	7
Purchase Energy Efficient Refrigeration Equipment	-7.0	4.7	3.7	2.3	8

[43] We provide with this report a simple interactive model showing how the rankings respond to changes in IP weights. The purpose of this ranking is to be transparent in how we initially analyzed alternatives and provide a means for decision-makers to input their own values into the model.

3.6 DISCUSSION: BARRIERS, ALTERNATIVES, AND RECOMMENDATIONS

From our analysis, there are two primary barriers to the uptake of energy efficient refrigeration equipment in corner stores. First is the prohibitive cost of buying energy efficient refrigeration equipment, especially when viewed in relation to the energy cost savings to be had by corner store owners. The second barrier is the over-supply of used and less energy efficient refrigeration equipment. Though there are clear linkages between them, these barriers require different policy approaches. In this subsection, we discuss which possible policy solutions apply to each of these barriers. We then look at ways in which energy consumption could be decreased without the use of new refrigeration equipment. Finally, we examine other considerations, such as the links between energy efficient refrigeration and healthy food access and the positive and negative externalities that could result from the barriers being overcome.

3.6.1 DEMAND BARRIER: PROHIBITIVE COST OF BUYING ENERGY EFFICIENT REFRIGERATION EQUIPMENT

To overcome the first barrier, policies must be crafted that can influence individual decision-making or incentivize store owners to buy more energy efficient refrigeration equipment. There are at least three ways of doing this: provide the true cost of ownership for refrigeration equipment, provide real-time feedback on energy use, or increase energy efficient refrigeration rebate amounts for small businesses like corner stores.

When shopping for new refrigeration equipment, store owners, like any other consumer, compares the sticker prices of equipment before selecting the one that has the best price relative to their budget. However, with refrigeration equipment that will likely be in service for a decade or more, sticker prices can often be misleading. Over the course of its useful life, a newer, more energy efficient refrigeration system might actually be cheaper than a used, less energy

efficient refrigeration system when accounting for energy, maintenance, and repair costs. Providing labeling that gives the true cost of ownership of a given piece of equipment or system could be a way to encourage the uptake of energy efficient refrigeration equipment in corner stores. However, there are three concerns with this approach. First, given the complexity and heterogeneity of refrigeration systems, estimates of the true cost of ownership could be misleading and difficult to obtain. Second, this intervention would only affect new refrigeration equipment, thus not allowing for comparisons between used and new equipment. Finally, findings in behavioral decision-making[44] suggest that an arrangement in which the upfront costs are high and the benefits are spread out over a future time period are unlikely to be successful.

A purely behavioral approach is to provide store owners with real-time feedback on their energy use. However, this approach suffers from some of the same issues as true cost of ownership labeling. For example, the heterogeneity of refrigeration equipment makes it difficult to implement this alternative at scale and it is not clear whether there is an ample supply of trained labor to do so. There are also questions regarding a corner store owner's ability to drastically change their energy consumption patterns even if they are aware of them and want to. Short of equipment maintenance and some relatively minor component upgrades (e.g. upgrading from an inefficient motor to more efficient motors), there are few low-cost options to reduce energy consumption in this sector.

Modified on-bill financing, tailored specifically for small businesses like corner stores, is an approach that could help overcome the cost barrier. If there were longer payback periods and fewer enrollment requirements, store owners might be more willing to participate in this program. With modified on-bill financing, a

[44] Kahneman and Tversky (1979)

benefit is received immediately, and the costs are spread into the future, a strategy that is more likely to be successful. However, like the other alternatives discussed in this subsection, modified on-bill financing will likely only impact those store owners purchasing new refrigeration equipment and will have no impact on the supply and use of older equipment. Finally, on-bill financing is predicated on the existence of cost savings and without proven cost savings a program such as this might not be feasible.

Perhaps the most viable option is to modify rebate programs by increasing the amounts available to small businesses like corner stores. These stores have capital requirements that are very different from large grocery stores and rebates are simply not large enough currently to encourage corner store owners to upgrade their refrigeration equipment. As things stand, current rebates may be benefitting those who would have bought newer refrigeration equipment without the rebate, resulting in a loss to ratepayers. Increased rebates would be a cheaper alternative to buying, distributing, and installing new energy efficient refrigeration equipment in corner stores as each purchase would require some non-zero contribution from store owners. These rebates could help close the cost difference gap between new and used equipment and, if high enough, incentivize store owners to buy new refrigeration equipment who otherwise would not have. A modified rebate program would also be relatively easy to implement because rebate programs already exist meaning no new processes or staffing would be needed. The primary concern with a rebate program is the cost, but, according to subject matter expert input, its cost is lower relative to its effectiveness than the options discussed above.

3.6.3 SUPPLY BARRIER: OVER-ABUNDANCE OF OLDER, USED, AND INEFFICIENT REFRIGERATION EQUIPMENT

Purchasing new refrigeration equipment for corner stores, while it could potentially reduce energy consumption in corner stores, is the most costly and

difficult to implement alternative for increasing the uptake of energy efficient refrigeration equipment in corner stores. It also does not address the over-supply problem, as the equipment being replaced will go back into the used refrigeration market.

In the long run, the most effective strategy for addressing the over-supply barrier is to require mandatory recycling of used refrigeration equipment. Over time, this would change the make-up of the fleet of refrigeration equipment in corner stores by reducing store owners' ability to access used and less energy efficient refrigeration equipment. This is one of the more complex alternatives to implement and would require coordination among several State agencies and the private sector in order to operate successfully. However, if properly implemented, it may yield the desired goal of increasing the uptake of energy efficient refrigeration equipment in corner stores and reduce energy consumption in this sector.

Previous work in the residential sector with refrigeration recycling through the Appliance Recycling Program (ARP) showed that increases in the energy efficiency of newer refrigerators made the ARP less cost effective over time. However, the refrigeration equipment used in the corner store sector is very different than that used in homes. As described above, corner store refrigeration is comprised of several pieces of equipment and can potentially last for decades. Additionally, the capital costs for installation of an entirely new system are large relative to the profit of the business. Therefore, the results of the ARP cannot be extrapolated to the corner store sector and a measure other than the traditional cost effectiveness may be needed to gauge success if the goals are to increase the uptake of energy efficient refrigeration equipment in corner stores or reduce energy consumption in corner stores.

3.6.4 REDUCING ENERGY CONSUMPTION WITHOUT NEW REFRIGERATION

The primary means of reducing energy consumption without the need for new refrigeration equipment is through the establishment of a maintenance education campaign. Short of replacing or modifying equipment, proper maintenance is an effective way of reducing energy consumption in corner stores without affecting business operations. Like the rebate alternative discussed above, there are programs that are already in operation to which refrigeration maintenance could be added. Specifically, a refrigeration maintenance campaign would fit well with the goals of Energy Upgrade California[45].

3.6.5 OTHER CONSIDERATIONS

3.6.5.1 HEALTHY FOOD ACCESS

On its own, an increase in the uptake of energy efficient refrigeration equipment among corner stores will not increase access to healthy foods. In fact, the two goals, energy efficiency in corner stores and healthy food access in low-income communities, often work in opposite directions. For example, depending on what kinds of produce are introduced to a store, the store would likely require additional refrigeration units, ultimately increasing electricity consumption. The goal with healthy food access in corner stores is therefore to find linkages between healthy food access and energy efficiency.

Support for and expansion of healthy food programs such as Healthy Retail SF and the Healthy Neighborhood Market Network could help work towards both goals. From the energy use data discussed above[46], there has been a steady

[45] Energy Upgrade California is a state initiative to help Californians save energy, reduce electricity grid demand, and make informed energy management choices (CPUC and CEC, 2018).

[46] We were unable to get energy use data for Healthy Neighborhood Market Network stores as they are served by LADWP.

decline in electricity consumption in stores that are involved in the Healthy Retail SF program. We cannot say conclusively whether or not this is the result of the store conversion process or some other mechanism, but even Healthy Retail SF participating stores that have not participated in energy efficiency programs have, on average, seen a decline in their energy consumption. Additionally, these stores have all helped to increase access to healthy foods in low-income communities that would not have it otherwise.

As things stand, programs like Healthy Retail SF and the Healthy Neighborhood Market Network, while successful in increasing food access in low-income communities and energy efficiency in corner stores, are limited in scope. Store conversions are costly and come only after extensive relationship building with store owners. Progress towards both goals could be had by providing more financial support to these kinds of programs so that they can increase their scope.

3.6.5.2 POSITIVE AND NEGATIVE EXTERNALITIES

In addition to a reduction in energy consumption among corner stores, a positive externality of the uptake of energy efficient refrigeration equipment in corner stores is a reduction in the use of high global warming potential and ozone depleting refrigerants. Because the average age of refrigeration equipment in corner stores is old, it is not uncommon to find banned refrigerants like R22 in use. Newer refrigeration equipment uses refrigerants that, in addition to being more efficient, have lower global warming and ozone depletion potential.

Reducing the supply of used refrigeration equipment, at the margins, is likely to result in a reduction in the number of corner stores, an unintended negative externality. Newer equipment is considerably more expensive than used equipment and will increase the capital costs of opening a corner store and

keeping a store open if there is a failure of the refrigeration system. This could be particularly troubling in areas where corner stores are a primary source of food, such as low-income communities.

3.6.6 FINAL RECOMMENDATIONS

Having discussed the policy alternatives, we offer the following recommendations:

1) Increase current refrigeration rebate amounts for small businesses like corner stores in order to incentivize them to buy newer equipment
2) Establish a maintenance education campaign to show the financial benefits of proper maintenance
3) Establish a program for recycling used refrigeration equipment in order to change the corner store refrigeration fleet energy efficiency over time

Together, these recommendations address both the demand and supply barriers to the uptake of energy efficient refrigeration equipment in the corner store sector. They also provide the opportunity for synergistic impacts. For example, the outreach on the maintenance education campaign can be used as a touchpoint for the discussion of rebates and vice-versa. These recommendations also allow for policies operating at shorter and longer time frames.

CONCLUSION

This report has investigated how to increase the uptake of energy efficient refrigeration equipment in corner stores in Los Angeles and San Francisco Counties using a wide range of data sources and data types. We have spoken with subject matter experts in the non-profit, public, and private sectors to understand how the corner store sector operates and examined the intersection

of healthy food access and energy efficiency. The recommendations that we have provided stem from this work.

We reiterate the need for a more in-depth study of the needs of the corner store sector, including a larger survey sample, more detailed survey instrument, in-depth interviews with corner store owners, and engagement with a larger number of subject matter experts, than was possible here given resource constraints. Because of the prevalence of corner stores in low-income urban and rural foodscapes, it is imperative that solutions be found that can increase healthy food access for those who most need it while helping the corner store sector do its part in achieving California's environmental goals.

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APPENDIX A: CORNER STORE SURVEY QUESTIONNAIRE

Store #: _____

1.) How long have you owned this business?

2.) Excluding yourself, how many employees work at this store in total?

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5+

☐ I'm the only person who works here

3.) What is the maximum number of cash registers open at one time?

☐ 1 ☐ 2 ☐ 3 or more

4.) What is the square footage of this store?

5.) Do you own the building this business is in?

☐ Yes ☐ No

6.) If you are not the original owner of the store, did you know the previous owner personally as a friend, acquaintance, or family member?

☐ Yes ☐ No ☐ N/A

7.) How interested are you in lowering your energy usage?

☐ 1 Very uninterested

☐ 2 Uninterested

☐ 3 Neither interested nor uninterested

☐ 4 Interested

☐ 5 Very Interested

8.) To your knowledge, have you been contacted by your energy provider to participate in energy savings programs?

☐ Yes ☐ No

9.) Have you participated in energy savings programs through your energy provider?

☐ Yes ☐ No

10.) Did your refrigeration system come with the store or did you purchase it separately or a combination of the two?

☐ Came with store ☐ Purchased ☐ Combo

11.) If you purchased your refrigeration system separately, did you buy it used or new?

☐ Used ☐ New ☐ N/A

12.) About how old is your refrigeration system, on average?

13.) In dollars, how much would you be willing to pay for a new refrigeration system?

14.) In dollars, how much do you estimate it would take to replace your refrigeration system with a new refrigeration system?

15.) Given your particular business needs, over what time period would you need to be able to pay off a new refrigeration system in full for you to invest in one?

☐ I'm not willing to invest in new refrigeration

☐ Less than 1 year

☐ 1 year

☐ 2 years

☐ 3 years

☐ 4 years

☐ 5 years

☐ More than 5 years

16.) How often do you perform routine maintenance on your refrigeration equipment (e.g. cleaning the condenser coils, replacing gaskets, etc.)?

☐ Once a month

☐ Once a quarter

☐ Once every 6 months

☐ Once a year

☐ Less than once a year

☐ Almost never

17.) Do you perform maintenance yourself or do you hire someone else, such as a contractor, to do this work?

☐ Do it myself ☐ Hire someone else

18.) If you do the maintenance yourself, have you been trained in refrigeration equipment maintenance beyond reading equipment manuals, such as through your refrigeration contractor or energy provider?

☐ Yes ☐ No ☐ N/A

19.) If your energy costs were reduced, how interested would you be in offering healthier items like fresh fruits and vegetables?

☐ 1 Very uninterested

☐ 2 Uninterested

☐ 3 Neither interested nor uninterested

☐ 4 Interested

☐ 5 Very Interested

☐ Already sell these items

20.) What language do you speak at home or with your family and friends?

NOTES

APPENDIX B: PROGRAM INFORMATION AND INFOGRAPHICS

ABOUT US.

Join the Healthy Neighborhood Market Network today!

The Los Angeles Food Policy Council hosts the **Healthy Neighborhood Market Network** (**HNMN**) a program that builds the capacity of corner store and neighborhood market owners to operate as successful healthy food retailers in under-served communities. Through business and leadership development training, networking, resource referrals and technical assistance, the HNMN seeks to organize the neighborhood market sector to take advantage of healthy food investments and resources, and sustain the impact of "healthy corner store conversion" programming.

Business Development

The Network offers a series of business and leadership development trainings designed to build the skills and networks of neighborhood markets so that you can:

- **Grow your business**
- **Attract new customers**
- **Improve your store, and**
- **Successfully vend healthy food products.**

Trainings are free to store owners, offered in English, Spanish and Korean and cover a wide range of topics, including:

- **Product Handling, Storage & Management**
- **Marketing**
- **Merchandising**
- **Store Design & Layout**
- **Human Resources and Management**
- **Customer Service & Community Relations**
- **Value of Organic and Local Foods**
- **Brand Strategy**
- **Fresh Food Profitability**
- **Use of CalFresh**
- **Sourcing & Supplier Relations**
- **Energy Efficiency**
- **Accounting & Bookkeeping**
- **Market Intelligence**

Leadership Development

In addition to practical skills that benefit your business, the Healthy Neighborhood Market Network is a space to grow into your leadership as a healthy food champion by understanding the critical needs of your community and engaging with policy makers from the city and county. Let your voice be heard!

Join the Healthy Neighborhood Market Network Today!

Check us out online for more details.

www.goodfoodla.org
www.communitymarketconversion.org

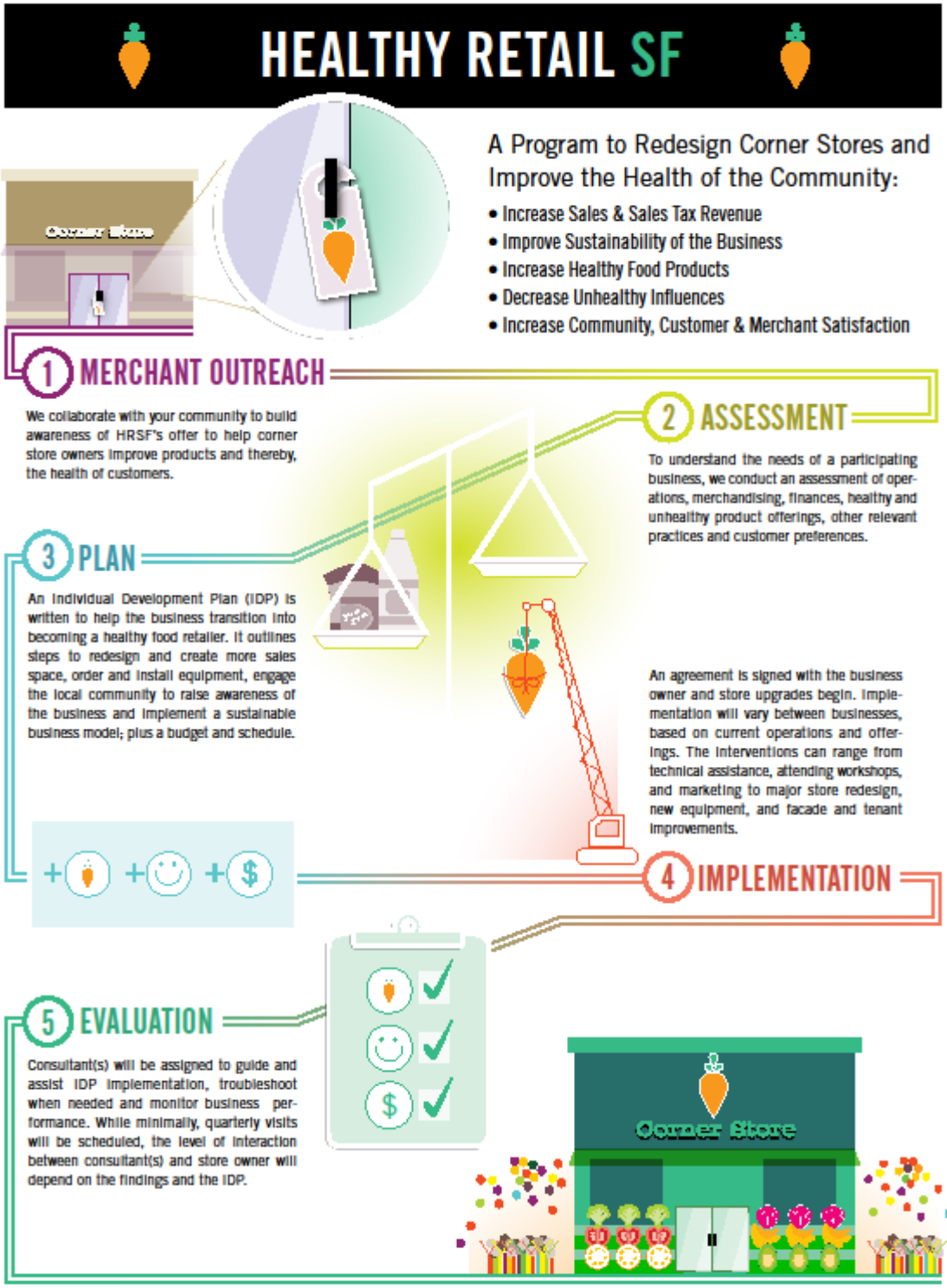
To join the listserv, email us at
healthymarkets@goodfoodla.org

HEALTHY NEIGHBORHOOD MARKET NETWORK

LOS ANGELES FOOD POLICY COUNCIL

About Us The Healthy Neighborhood Market Network is a a project of the **Los Angeles Food Policy Council** (**LAFPC**), a nonprofit collective impact initiative, working to make Southern California a Good Food Region for everyone--where food is healthy, affordable, fair and sustainable.

In addition to ongoing free training events for neighborhood markets and food entrepreneurs, LAFPC can offer project-based technical assistance for "market makeover" projects of various scales. To learn more about the range of consulting services provided by LAFPC staff, contact **marketconversions@goodfoodla.org** or call **213-978-1568**.


HEALTHY RETAIL SF
A Program to Redesign Corner Stores and Improve the Health of the Community:
• Increase Sales & Sales Tax Revenue
• Improve Sustainability of the Business
• Increase Healthy Food Products
• Decrease Unhealthy Influences
• Increase Community, Customer & Merchant Satisfaction
1 MERCHANT OUTREACH
We collaborate with your community to build awareness of HRSF's offer to help corner store owners improve products and thereby, the health of customers.
2 ASSESSMENT
To understand the needs of a participating business, we conduct an assessment of operations, merchandising, finances, healthy and unhealthy product offerings, other relevant practices and customer preferences.
3 PLAN
An Individual Development Plan (IDP) is written to help the business transition into becoming a healthy food retailer. It outlines steps to redesign and create more sales space, order and install equipment, engage the local community to raise awareness of the business and implement a sustainable business model; plus a budget and schedule.
An agreement is signed with the business owner and store upgrades begin. Implementation will vary between businesses, based on current operations and offerings. The interventions can range from technical assistance, attending workshops, and marketing to major store redesign, new equipment, and facade and tenant improvements.
4 IMPLEMENTATION
5 EVALUATION
Consultant(s) will be assigned to guide and assist IDP implementation, troubleshoot when needed and monitor business performance. While minimally, quarterly visits will be scheduled, the level of interaction between consultant(s) and store owner will depend on the findings and the IDP.
Corner Store

GROCERY AND CONVENIENCE STORE
FACT SHEET

Energy Management for Your Business

PG&E's Energy Solutions for Grocery and Convenience Stores

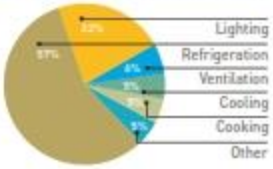
Industry Facts

A typical grocery store spends approximately $4 per square foot on energy costs each year. By lowering these costs, you can significantly increase your profitability. Energy management experts from Pacific Gas and Electric Company (PG&E) are ready to help you get started.

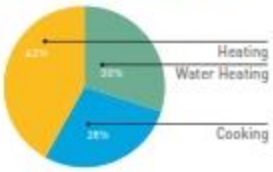
In 2010, PG&E paid more than $116 million in program incentives to business customers, resulting in annual energy savings of 965 million kilowatt-hours (kWh) and 27 million therms. This is the equivalent of taking 66,000 cars off the road for a year.

A significant portion of your facilities' financial success depends on reducing your controllable costs. PG&E's manufacturing energy specialists can help you use energy more efficiently, maximize the return on your investments, improve net operating income, increase building and facility asset value and balance out your carbon footprint.

Major Electricity Use in Grocery Stores



Major Gas Use in Grocery Stores



Energy Management Services for Grocery Stores

Service	Description	Result
Pricing Plans	Analysis of your business's energy usage patterns to determine your most beneficial pricing plan	**Can reduce your energy bills**
Customized Retrofit Incentives	Incentives for replacing equipment and systems to achieve greater energy efficiency	**Reduces energy costs and improves operations**
Energy-efficiency Rebates	Rebates paid for installing qualifying energy-efficient equipment	**Improves return on investment for most common measures**
Energy Audits	Assessment of your site to identify the best opportunities for improved energy efficiency and potential savings	**Analyzes current energy usage and identifies savings opportunities**
New Construction	Resources and incentives for energy-efficient design and construction	**Increases operational efficiency and reduces energy costs**
Automated Benchmarking Service (ABS)	Online tool to monitor monthly energy-usage data using ENERGY STAR® Portfolio Manager	**Measurement and tracking of your energy performance**
Financial Modeling	Help with determining how and where value will flow from energy-efficiency investments	**Better sharing of costs and benefits in multi-tenant buildings**
LEED Assistance	Assistance achieving energy and atmosphere credits in the LEED certification process	**Collaboration and alignment of environmental goals**
Demand Response	Incentives for voluntary temporary load reduction during peak demand periods	**Reduces peak energy costs and ensures the reliability of California's electrical grid**
Solar and Self-generation	Rebates for the installation of photovoltaic, wind, fuel cell and other generation systems	**Reduces energy costs and carbon footprint**
On-bill Financing (OBF)	No-interest loans available to eligible customers for energy-efficient retrofit projects, to be repaid through monthly PG&E bills	**Provides financing for energy-efficiency projects**

Energy-efficiency Solutions and New Technologies

The products below are a sample of energy-efficiency retrofits for grocery and convenience stores. PG&E account representatives, program partners and affiliates can help you choose the projects that make the most sense for your store.

Energy-efficiency Measures

Measure	Benefit	Typical Payback
Optimize Controls Strategy	Improved scheduling, sequencing and set-points can reduce wasted energy.	Immediate to 1 year
Lighting Controls	Electronic controls can be used to switch off lights when not in use.	1.5–6 years
Indoor Lighting Upgrades	Replacing older generations of fluorescent lamps with the latest ones or converting to LEDs or HIDs, where applicable, can lower lighting costs.	2–5 years
Variable Frequency Drives (VFDs) on Motors	VFDs on supply air and cooling tower fans improve efficiency by matching the motor speed to the load requirement.	2–7 years
Window Film	Window film can reduce heat gain through windows and lower cooling costs.	3.5–6 years

PG&E can help you develop and implement an action plan to meet your short- and long-term energy management goals.

New Technologies

Measure	Benefit
Wireless Building Controls	Increased monitoring and control of building systems without installation of costly wiring
Discharge Air Regulation Technique (DART)	Low-cost way to improve constant-volume air handling efficiencies—without a major retrofit to variable air volume (VAV)—using advanced fan control
Daylight Harvesting Ballasts	New lighting ballasts that automatically adjust output based on daylight conditions
Task/Ambient Lighting	An innovative way to lower lighting energy use by lowering ambient levels and employing high-efficiency task lighting (typically LED)
Frictionless Chiller Compressor	Increased chiller efficiencies (especially at part-load) through the use of energy-efficient frictionless compressors
Variable Refrigerant Flow Package Units	More efficient and effective delivery of cooling by varying refrigerant flow as opposed to just airflow
Digital Controls System Upgrades	Digital controls to track and manage energy use in buildings more precisely

Your Next Steps with PG&E

For more information on how PG&E can help you manage energy consumption and reduce costs, visit www.pge.com/grocery.

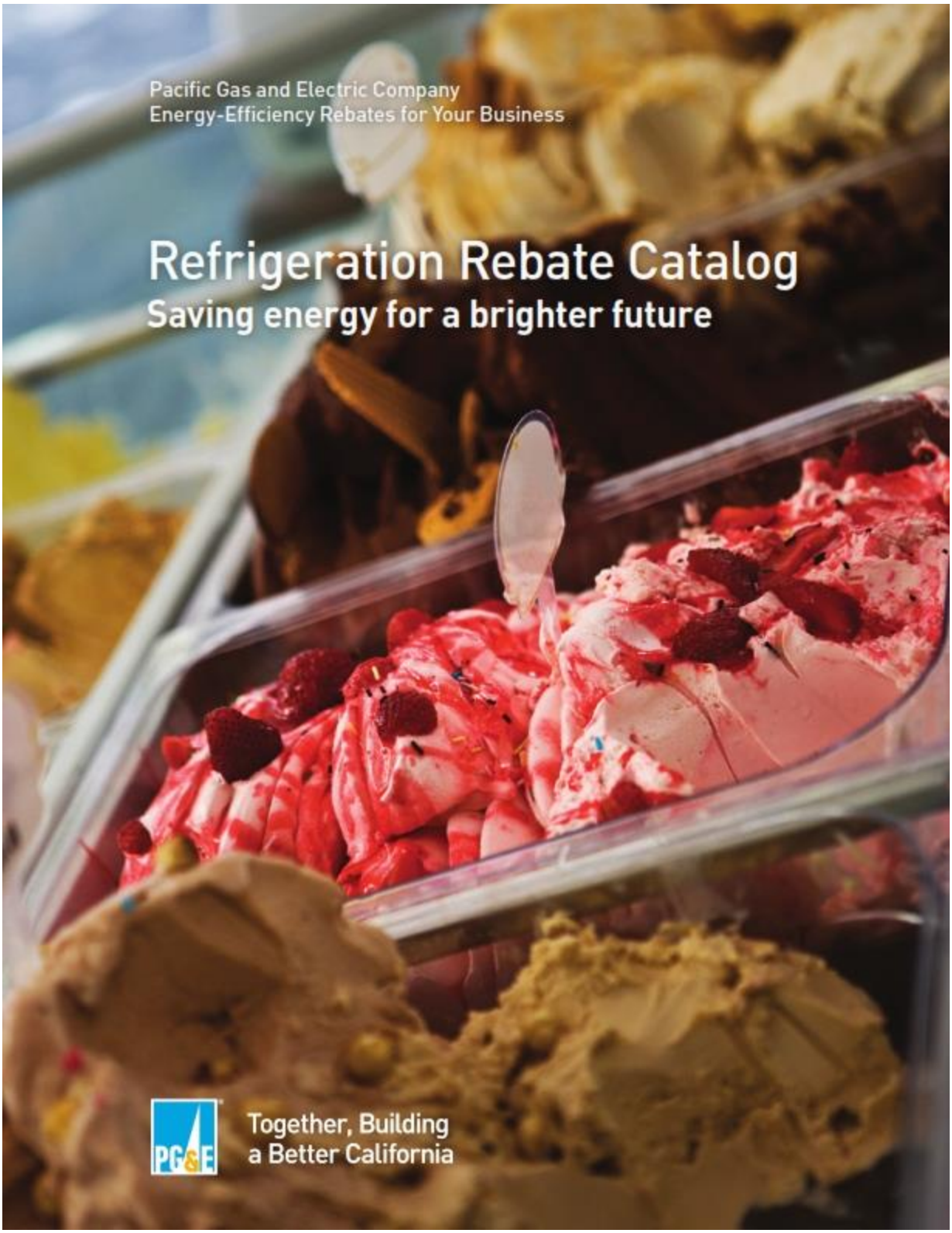
You can also contact your PG&E account representative or call our Business Customer Service Center at 1-800-468-4743.

New Regulatory Requirements

PG&E's energy management services can also help your organization meet the following energy-focused standards for California commercial buildings.

California Energy Standards

Name	Description
California Title 24	Specifies minimum building energy performance
California AB 1103	Mandates benchmarking of commercial buildings being sold, leased or refinanced
California AB 32 (Global Warming Solutions Act)	Requires businesses to reduce greenhouse gas emissions
Nitrogen Oxide (NOx) Boiler Standards (San Francisco Bay Area and San Joaquin Valley)	Specifies lower levels of allowable NOx emissions associated with boiler systems
Green Building Initiative State of California Executive Order S-20-04	Requires improved energy efficiency and reduced water consumption to balance out the carbon footprint of all new buildings in California


Pacific Gas and Electric Company
Energy-Efficiency Rebates for Your Business
Refrigeration Rebate Catalog
Saving energy for a brighter future
PG&E
Together, Building
a Better California

Pacific Gas and Electric Company (PG&E) offers financing with 0 percent interest to help you replace inefficient and worn-out equipment. With our Energy Efficiency Financing (EEF), loans range from $5,000 to $100,000, and loan payments are made conveniently through your PG&E energy statement. For more information, eligibility requirements and steps to apply for a loan, visit pge.com/eef.

Table of Contents

Carefully read the specifications below to ensure that you are installing qualifying products. All PG&E incentives apply towards the purchase of new or replacement energy-efficient equipment. Used or rebuilt equipment is not eligible, and customers must include proof that the appliances meet all the required energy-efficiency specifications. Please note that funding for these programs is limited and available on a first-come, first-served basis until allocated funds are exhausted or the program ends, whichever comes first. This program may be modified or terminated without prior notice, and additional terms and conditions may apply.

If building type eligibility is not listed, all building types are eligible. Additional requirements may apply.

For the most up-to-date catalogs, visit pge.com/businessrebates.

Anti-Sweat Heater (ASH) Controls

Requirements:

- Display cases must be equipped with humidity-sensing controls that reduce the amount of power supplied to the heaters.
- Controls must sense the relative humidity in the air surrounding the display case and reduce or turn off the anti-sweat heaters of the glass door (if applicable) and door frame during periods of low humidity.
- Equivalent technologies that reduce or turn off anti-sweat heaters depending on the level of condensation on the inner glass pane may qualify.
- Rebate amount is based on the horizontal linear footage of the display case, i.e., the width of the display case.
- Installation address must have a commercial electric account with PG&E.

Exclusions:

This rebate cannot be used in conjunction with the rebate for *New Low Temperature Refrigeration Display Cases with Special Doors* and retrofit *Special Doors with Low/No Anti-Sweat Heat on Low-Temperature Display Cases.*

Rebate Code	Description	Rebate/ Unit Measure
R7	**Anti-Sweat Heater (ASH) Controls** Medium Temperature	$25/linear ft.
HB31	**Anti-Sweat Heater (ASH) Controls** Low Temperature	$25/linear ft.

Efficient Evaporator Fan Motors

Requirements:

- Install electronically commutated motors (ECM) in refrigerated display cases, walk-in coolers and freezers.
- Fan motor must replace standard efficiency shaded-pole or permanent split capacitor evaporator fan motor.
- Installation address must have a commercial electric account with PG&E.

Exclusions:

- Evaporative Fan Motors (ECM) for walk-in coolers or freezers are only eligible for units built prior to January 1, 2009.
- May not be used in conjunction with PG&E rebates for new display cases.

Rebate Code	Description	Rebate/ Unit Measure
R145	**Efficient ECM Evaporator Fan Motor** Medium-Temperature Display Case	$35/motor
R176	**Efficient ECM Evaporator Fan Motor** Low-Temperature Display Case	$50/motor
RF004	**Efficient ECM Evaporator Fan Motor** Walk-in Cooler	$75/motor
RF005	**Efficient ECM Evaporator Fan Motor** Walk-in Freezer	$75/motor

Auto-Closers for Walk-in Cooler or Freezer Doors

Requirements:

- Auto-closer must be applied to the main insulated door of a walk-in cooler or freezer; additional interior doors are not eligible.
- Auto-closer must be able to firmly close the door when it is within one inch of full closure.
- Installation address must have a commercial electric account with PG&E.

Exclusions:

- Additional interior doors are not eligible.
- Door closers are only eligible for walk-in coolers or freezers built prior to January 1, 2009.

Rebate Code	Description	Rebate/ Unit Measure
R79	**Auto-Closers for Walk-in Cooler Doors**	$75/closer
R80	**Auto-Closers for Walk-in Freezer Doors**	$75/closer

Evaporator Fan Controllers for Walk-in Coolers and Freezers

Requirements:

- Controller must reduce the airflow of evaporator fan in a walk-in cooler or freezer when the compressor cycles off and no refrigerant flows through the evaporator.
- Controller must manage a minimum fan load of 1/20 horsepower (hp) when the fan operates continuously at full speed.
- Controller must reduce fan motor power by at least 75 percent during the compressor off cycle.
- Rebate applies to only the following building types: grocery, restaurant (fast-food and sit-down), and single-story large retail.
- Installation address must have a commercial electric account with PG&E.

Exclusions:

Do not install the controller if any of the following conditions apply:

- Compressor runs all the time with high-duty cycle.
- Evaporator fan does not run at full speed all the time.
- Evaporator fan motor runs on polyphase power.
- Evaporator fan does not use off-cycle or time-off to defrost.

Rebate Code	Description	Rebate/ Unit Measure
R53	**Evaporator Fan Controllers for Walk-in Coolers and Freezers**	$75/controller

For more information and for the most up-to-date catalogs, visit **pge.com/businessrebates** or call our **Business Customer Service Center** at **1-800-468-4743**.

New High-Efficiency Refrigeration Display Cases with Special Doors (Low Temperature)

Requirements:

- Replacement of a less efficient, reach-in unit with a new remote/or self-contained, high-efficiency, reach-in case.
- New display cases must include:
  - T8 lamps with electronic ballasts or LEDs
  - Electronically commutated motors
  - Low/no anti-sweat glass, double-paned doors
- Rebate replaces existing low temperature, self-contained/ remote cases only (see definitions on page 5).
- Rebate is based on the linear footage of the new display case.
- New case should be equal to or shorter than original case.
- Rebate applies to only the following building types: assembly, sit-down restaurants, grocery, and retail.
- Installation address must have a commercial electric account with PG&E.
- Refer to the definitions on page 5 for explanation of medium and low temperature.

Exclusions:

- Rebate cannot be used in conjunction with the *Anti-Sweat Heater (ASH) Controls* rebate.
- Deli cases, custom coolers/freezers and walk-in boxes with reach-in doors do not qualify for this rebate.
- Display case replacements that are part of large-scale store remodels and any new construction projects are not eligible. Large-scale remodels are projects involving 50 percent of the linear feet of refrigerated casework or 32 linear feet of casework replacements, whichever is less.

Rebate Code	Description	Rebate/ Unit Measure
R87	**New High-Efficiency Refrigeration Display Cases with Special Doors** Low Temperature	$75/linear ft.

New Display Cases to Replace Open Multi-Deck Refrigerated Displays (Low and Medium Temperature)

Requirements:

- Replace an open multi-deck display case without doors with a new case that includes doors.
- New display cases must include:
  - T8 lamps with electronic ballasts or LEDs
  - Electronically commutated motors
  - Double-pane doors with heat-reflective treatment or gas fill
  - New case should be equal to or shorter than original case
- Rebate can be for self-contained or remote cases.
- Rebate is based on the horizontal linear footage of the new display case.
- Rebate applies to grocery stores only.
- Installation address must have a commercial electric account with PG&E.
- Refer to the definitions on page 5 for additional clarification.

Exclusions:

- Deli cases, custom coolers/freezers and walk-in boxes with reach-in doors do not qualify for this rebate.
- Display case replacements that are part of large-scale store remodels, and any new construction projects, are not eligible. Large-scale remodels are projects involving 50 percent of the linear feet of refrigerated casework or 32 linear feet of casework replacements, whichever is less.

Rebate Code	Description	Rebate/ Unit Measure
R4	**New Display Cases to Replace Open Multi-Deck Refrigerated Displays** Low Temperature	$175/linear ft.
R5	**New Display Cases to Replace Open Multi-Deck Refrigerated Displays** Medium Temperature	$75/linear ft.

Vending Machine Controllers

Requirements:

- Installed controller must include a passive infrared occupancy sensor to turn off fluorescent lights and compressor when surrounding area is unoccupied for 15 minutes or longer.
- Refurbished vending machines that include this technology are eligible for this rebate.
- Vending machine plugs into controller, therefore, the measure can be used even when the customer is not the owner of the vending machine.
- Rebate only applies to existing buildings.
- Rebate applies to only the following building types: assembly, education (community college, primary/secondary school, relocatable classrooms, universities), grocery, hospitals, nursing homes, hotels, motels, offices, restaurants (fast-food, sit-down), retail, storage, refrigerated warehouses, other.
- Installation address must have a commercial electric account with PG&E.

Installation process:

Control should periodically power up the machine at two-hour intervals to maintain product temperature and provide compressor protection.

Rebate Code	Description	Rebate/ Unit Measure
R86	**Vending Machine Controller** Cooled	$100/controller

4 For more information and for the most up-to-date catalogs, visit **pge.com/businessrebates** or call our **Business Customer Service Center** at **1-800-468-4743**.

Definitions

Anti-Sweat Heaters (ASH): ASH are typically applied to low-temperature refrigerated display cases to prevent glass doors from fogging and cold surfaces from forming condensation. Commonly, ASH stay on at full load around the clock. Their contribution to the cooling load and electric power consumption of the refrigeration system can be significant.

Display Cases: These are designed to store and display chilled and/or frozen foodstuffs.

Electronically Commutated Motors (ECM): ECMs are synchronous motors that are powered by a DC electric source using an integrated inverter/switching power supply, producing an AC electric signal that drives the motor.

Horsepower (hp): This is a unit of power equal to 550 foot-pounds per second.

Large Office: Office buildings typically greater than 20,000 square feet.

Large Retail: Retail buildings that are typically greater than 5,000 square feet.

Low Temperature: For freezers, refrigerated space temperatures are considered "low" if they are below 32 degrees Fahrenheit.

Medium Temperature: For coolers, refrigerated space temperatures are considered "medium" if they are between 32 to 50 degrees Fahrenheit.

Reach-in Cabinets: These are refrigerated retail display cabinets with chilled glass door(s) and horizontal/semi-horizontal merchandising. Cabinets enable customers to view contents even when closed, and enable customers to self-serve. Styles include:

- "Plug-in" refrigerated display cabinets with integral refrigeration systems (i.e., incorporating a compressor and condensing unit)
- "Remote" refrigerated display cabinets designed to work with a non-integral refrigeration system (i.e., where the compressor and condenser, or all or parts of the refrigeration system, are located at a different location from the cabinet)

Shaded-Pole Motors: This type of motor is the original form of an AC single-phase induction motor.

Small Office: Office buildings typically less than 20,000 square feet.

Small Retail: Retail buildings that are typically less than 5,000 square feet.

System Types: Commercial refrigeration equipment can be classified into two categories: split-system refrigeration systems and self-contained refrigeration systems. Split-system configurations have a condenser unit that is located remotely, usually on the rooftop, which allows it to exchange heat with the outside air. Self-contained units have all of the components, including the condenser, contained in a single package.

Walk-in Coolers/Freezers: Also known as "walk-ins," these are insulated refrigerated spaces with access doors, large enough for people to enter. Walk-ins are used for food storage and merchandising in the food service and food sales applications.

5

More ways for your business to save money

To find the latest rebate information and catalogs or to apply for rebates online, visit pge.com/businessrebates.

PG&E offers a wide range of tools and resources that can help your business save energy and money while helping the environment:

- Didn't find a rebate matching the high-efficiency equipment you'd like to install? You may still be eligible for financial support with PG&E's customized incentives for businesses. To learn more, visit pge.com/cr.
- Sign up for automated benchmarking service at pge.com/benchmarking, which allows you to use the ENERGY STAR® Portfolio Manager to track and compare your facility's energy performance over time.
- Use PG&E's audit tools to identify options for saving energy and money at your facility, and get started on developing a comprehensive energy management plan. Visit the Business Energy Checkup at pge.com/waystosave.
- Find a suite of customized incentives for retrofitting outdated, inefficient equipment, as well as incentives to optimize existing equipment through PG&E's Retrocommissioning (RCx) Program at pge.com/rcx.
- Explore PG&E's demand response programs, which offer incentives for managing your energy use during times of peak demand at pge.com/demandresponse.
- Check out PG&E's incentives for solar, wind and fuel cell self-generation equipment if you are considering generating your own electricity.

You may also learn more about these programs, tools and offers by contacting your local PG&E account representative or by calling our **Business Customer Service Center** at 1-800-468-4743.

Ready to get started with your next project and need the help of a contractor? Find local vendors who participate in PG&E's energy-efficiency rebate programs for your business at pge.com/tradeprodirectory.

Together, Building a Better California

Pacific Gas and Electric Company

On-Bill Financing for Energy Efficiency Upgrades



Zero-interest financing for business customers

Energy efficiency upgrades are a great way for businesses to lower their energy use and reduce monthly bills. PG&E can help you make facility improvements without high interest costs.

What is On-Bill Financing?

- The Energy Efficiency Retrofit Loan Program, also known as On-Bill Financing, helps eligible customers pay for energy efficiency retrofit projects with zero interest, zero penalty loans.
- The program works in conjunction with PG&E's energy efficiency rebate and incentive programs by eliminating up-front costs.
- After project completion, PG&E will lend the money for the retrofit, and the customer will pay the loan—interest free—through a line-item on their monthly utility bill.

Program benefits for business customers:

- **Financing from $5,000 to $100,000 of the project cost, after incentives**
- **Loan terms up to five years**
- **Zero interest**
- **No minimum credit requirements**
- **Loan repayment is based on projected energy savings**

How much can businesses and agencies borrow?

- Business customers may qualify for **loans between $5,000 and $100,000** per premises, with loan periods of **up to 60 months.**
- Government agencies may qualify for **loans between $5,000 and $250,000** per project, with loan periods of **up to 120 months.**
- Loan funds must be used to purchase and install qualifying energy efficient equipment.

What kinds of projects are eligible?

Financing is available to fund many energy efficient technology upgrades, including LED lighting, refrigeration, HVAC, food service and LED streetlight projects. To qualify, a project's total cost savings must be sufficient to repay the loan within the maximum loan term limits, and each product must receive a rebate or incentive through a PG&E program.

Customers may install the equipment themselves or hire a contractor to perform the work. PG&E may need to inspect the site before the old equipment is removed and may perform another inspection upon project completion.



How is the loan term calculated?

To qualify for financing through the On-Bill Financing Program, a project's estimated energy savings must be sufficient to repay the loan during the maximum allowable payment term. The monthly payment is calculated based on estimated monthly energy savings.

For example:

Project cost	**$10,000**
Energy efficiency rebates and/or incentives	**($2,500)**
Loan amount (remaining costs to be funded)	**$7,500**
Estimated monthly energy savings from retrofit	**$300**
Monthly loan installment billed on PG&E utility bill	**$300**
Simple payback period (loan amount divided by monthly payment amount)	**25 months**

The loan terms for the customer in this example would be $300 per month for 25 months.

If a business customer closes a PG&E account before the loan term ends—for example if a business closes or moves to a new location—the business must pay off its loan balance when the final bill is settled.

Does your business or agency qualify?

Before beginning your retrofit project, contact PG&E to make sure your energy efficiency upgrades qualify for On-Bill Financing. To be eligible, customers must have a PG&E account that has been continuously active for the past 24 months and has been in good standing for the past 12 months. Business customers are also subject to a payment history screening.

Next Steps

To find out more information about the On-Bill Financing Program and to check your eligibility, contact your PG&E Account Manager through the Business Customer Service Center at 1-800-468-4743, or visit pge.com/obf.

Pacific Gas and Electric Company (PG&E) has contracted with Richard Heath and Associates (RHA), a third party energy efficiency implementation specialist, to provide underserved small- and medium-sized commercial customers in 18 counties located in Northern and Central California with a multi-faceted direct implementation program. RHA's Energy Fitness Program (EFP) includes: outreach, energy assessment, customer education, direct installation of a tailored package of low-cost measures, personalized technical assistance and additional program referrals. By increasing their energy efficiency, customers can save money on their utility bill and energy while at the same time benefiting the environment by conserving our natural resources and reducing greenhouse gas.

Eligibility Requirements

The Energy Fitness Program provides services to small- and medium-sized commercial PG&E customers with a demand of less than 200 kW in PG&E's service territory in the following counties: Butte, Colusa, Fresno, Glenn, Lake, Lassen, Madera, Merced, Plumas, Sacramento, San Joaquin, Shasta, Stanislaus, Sutter, Tehama, Trinity, Yolo and Yuba. Your PG&E Energy Solutions and Service Representative can help determine if you are eligible.

Energy Efficiency Measures Covered

The program covers many energy efficiency measures, including but not limited to:

- **Lighting (Fluorescents, Induction, LED).**
- **High Bay Fixture Conversions.**
- **Occupancy Sensors.**
- **Vending Machine Controllers.**
- **Refrigeration**
  - **Case Lighting (LED)**
  - **ECM Motor**
  - **Anti-Sweat Heaters**
  - **Auto Door Closers**

RHA
ENERGY FITNESS • ENERGY WATCH

SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL Company

SCE Energy Conservation Series

Cold Hard Facts About Refrigeration and Energy Conservation

Maintaining, upgrading and replacing refrigeration equipment can help reduce energy costs for grocery and convenience store owners like you.

Whether you operate a supermarket, grocery store or convenience store, refrigeration represents an average of 43% of your electricity usage.[1] That includes the power required to run reach-ins, walk-ins, and under-the-counter refrigerators/freezers, as well as a multitude of food and drink storage and display cases.

Conserving Energy Is Easier Than You Think

The good news is that proper maintenance, plus modest retrofitting or upgrades, can save your business a significant amount of energy. Factoring in various incentives and potential savings on replacing certain older equipment may also be a smart choice.

We have compiled this handy guide to help you in that effort.

How Do You Rate?

A good energy conservation program starts with good measurement. So be sure to use the Energystar.gov Portfolio Manager to measure and track your energy consumption at **energystar.gov/buildings/facility-owners-and-managers/existing-buildings/use-portfolio-manager.**

Preventive Maintenance Is Job One

Refrigeration is the biggest energy load for a typical grocery store. But that means you can make potentially big improvements through routine maintenance as well, much of it with store staff.

✓ **Clean evaporator and condensing coils every 30 days**

Clean your A/C's condenser/evaporator coils at the beginning of the season. Clean coils will lower your energy costs, extend the unit's life and provide cleaner air for you to breathe. The fin coils on the outside A/C unit can be washed with a hose. Coils on inside units are best serviced by a trained technician.[2]

So keeping them clean should be your top priority. As a side benefit, clean condenser coils tend to preempt maintenance problems, which cost time and money.

As a cautionary note, some coil cleaning solutions are corrosive, expensive and should be avoided. Instead, use soap and water with a soft bristle brush; or try a mixture of three parts water to one part de-greaser.

✓ **Check refrigerant charge**

By putting extra strain on the compressor, incorrect refrigerant levels can compromise efficiency by 5 to 20% and raise the risk of early component failure.[3]

✓ **Adjust controls**

Adjusting floating suction pressure control (FSPC) and floating head pressure control (FHPC) can save an average of 30,000 to 60,000 kWh from FSPC and 75,000 to 150,000 kWh from FHPC in a typical Southern California grocery store.[4]

[1] Facility Type: Supermarkets and Grocery Stores. Energy.gov, January 2008.
[2] energysavers.gov
[3] Facility Type: Supermarkets and Grocery Stores. Energy.gov, January 2008.
[4] Portland Energy Conservation Inc. (PECI). San Diego, California.

Did You Know?

Refrigeration is by far the largest load in a grocery store, representing an average of **43% of electricity usage.**[5]

Fascinating Fact:

Dirty evaporator and condensing coils can rob refrigerators of **90% of their energy efficiency.**[7] Clean every 30 days.

- ✓ **Clean fan blades to reduce drag**

  Remove the fan cover and clean with a de-greaser solution. Periodically, you should also have a service technician make sure that the fan motor is running at its specified speed.

- ✓ **Clear trash and weeds around exterior condensing units**

  Doing so will ensure adequate airflow and promote better performance.

- ✓ **Reduce air leakage**

  Have a qualified technician carefully test the entire system, as air leaks make the compressor work harder, which translates into higher energy usage.

- ✓ **Inspect gaskets and door sweeps**

  Worn gaskets and torn door sweeps allow air seepage and increase refrigeration cycling.

- ✓ **Lubricate door hinges annually**

  Doors that don't shut properly can cause refrigeration units to overwork to maintain proper temperature.

- ✓ **Maintain appropriate temperature settings**

  Set the holding temperature between 35° and 40° for walk-in coolers, between -5° and 5° for freezers.

- ✓ **Inspect electrical connections**

  Have a qualified electrician verify that they are tight. Loose wires can result in high amperage, which will increase energy usage.

- ✓ **Conduct regular inspections**

  A detailed on-site inspection every one to three years more than pays for itself through improved energy efficiency and preemptive maintenance. Have the technician check control settings plus the condition of gaskets, hinges and motors.

Give Existing Equipment a Makeover

Maximizing your existing refrigeration investment through modest upgrades can deliver a significant payoff in terms of energy savings.

However, be advised that your staff may not have the expertise to fully accomplish this. That's why it may be advisable to use outside experts, who are often able to uncover maintenance and operational issues that are not readily apparent.

- ■ **Insulate suction lines**

  Suction lines move refrigerant from the evaporator to the compressor. Keeping them from absorbing heat can make the entire system run more efficiently and reduce energy usage. This is normally a very easy and inexpensive task.

How Cool Is That?

Replacing refrigeration fans with electrically commutated motors will **reduce the energy consumption** of refrigerator and freezer cases by **40 to 70%.**[6]

[5] Facility Type: Supermarkets and Grocery Stores. Energy.gov, January 2008.
[6] *Duke Energy® Progress*. progress-energy.com.
[7] *14 Ways Restaurants Can Save Money on Refrigeration*. Biermayer, Peter. PG&E, March 2015.

- **Use automatic door closers on walk-in refrigerators**

  Installing these closures is also one of the least expensive things you can do to cut energy usage. Spring hinges are easy to install and are ideal for high-traffic walk-ins.

- **Purchase strip curtains for walk-ins**

  Strip curtains minimize the amount of hot air entering the cooler, which reduces system cycling and energy usage.

- **Install heat recovery systems**

  Waste heat from refrigerators is often sufficient to make hot water for a midsize supermarket. By taking some of the burden off your hot water heater, you can save energy.

- **Install LED lights in walk-ins and display cases**

  LED lights use less energy, operate better in cold and give off less heat, which lessens refrigeration cycling.

- **Display case shields**

  Placing shields over your display cases can reduce energy usage by 8% when applied overnight—with even more savings the longer they stay in place.[8]

- **Install evaporator fan motors**

  Most walk-in evaporator fan motors run continuously, even though full airflow is usually required only about half the time. Using electrically commutated motors will reduce the energy consumption of your refrigerator and freezer cases by 40 to 70%.[9]

- **Add evaporator fan controllers to walk-in coolers**

  These devices improve the energy efficiency of walk-in refrigerators by reducing airflow when the compressor cycles off and cutting fan motor power during off cycles.

Illuminating Insights!

LED lights use less energy, operate better in cold and require refrigerators to work less because they generate less heat.

Good Habits Can Have a Great Impact

Just modifying a few procedures and educating employees can make a huge difference in how much energy your store uses —with no out-of-pocket expenditures in many cases.

- **Don't leave cooler doors propped open**

  When loading and unloading walk-ins, escaping cold makes the equipment work harder to maintain a consistent temperature.

- **Turn off lights upon exiting walk-ins**

  Even the small amount of heat that lights produce can cause the unit to work harder.

- **Set the proper holding temperature**

  Temperatures set too low will make equipment work harder. Supermarkets can realize big energy savings by recalibrating temperature set points. Walk-in coolers should be kept between 35° and 40°, freezers between -5° and 5°.

- **Check humidity sensors**

  In many stores, these devices are not working or are inaccurate by several percentage points. Fixing and cleaning them ensures that air-cooling systems and anti-condensate heaters are not operating more than needed.

Above and Beyond Energy Savings

Improving the performance of refrigeration equipment brings a host of additional benefits:

- ✓ Uniform cabinet temperatures
- ✓ Reduced heat output from more efficient compressor systems and fan motors
- ✓ Improved food quality
- ✓ Increased productivity
- ✓ A cleaner environment
- ✓ Extended product lifetimes

[8] *Duke Energy® Progress. progress-energy.com.*
[9] Ibid.

- **Make room around equipment for better air circulation**

  Disrupting the airflow around your refrigeration equipment—especially the coils—decreases performance.

- **Set defrost frequency set at minimum requirements**

  Shoot for four- to six-hour intervals spanning 20 to 40 minutes depending on the traffic through your walk-in.

- **Turn off door heaters**

  Unless there is significant frost on the door or water dripping from the front of the refrigerator, these devices are probably unnecessary.

New Equipment Means New Ways to Conserve

Sometimes, it's better for energy conservation and your bottom line to invest in newer, more energy-efficient refrigeration. It could save you thousands of dollars per year in energy and energy-efficient equipment is often priced similar to standard equipment.

A simple way to ensure that new equipment is energy efficient is to purchase only Energy Star®-Qualified products. These are approximately 30% more energy-efficient than standard models.[10]

New equipment may also qualify for incentives and financing which, factored into your purchase price, could yield a favorable payback period.

How Do You Know When It's Time to Buy New?

Start your decision-making process by following these steps:

- ✔ Calculate current costs
- ✔ Include cost to maintain current equipment
- ✔ Figure total price of ownership
- ✔ Use the Food Service Technology Center lifecycle calculator at fishnick.com/saveenergy/tools/calculators. Calculators are customizable and include actual brand names and models.
- ✔ Include the purchase price and cost to install new equipment

What Is Energy Star?

Commercial equipment that has earned Energy Star qualification meet strict guidelines set by the U.S. Environmental Protection Agency for energy-efficiency. Performance is certified by third-parties based on testing performed in an EPA-recognized laboratory.

Star Quality?

Investing in new Energy Star-Qualified refrigeration can help cut energy costs by 10 to 30%![11]

Make Your Refrigerators Energy Stars[12]

Installing new Energy Star-Qualified refrigeration could bring you benefits like these:

$60 to $70 Annual Savings

Save 590 to 730 kWh/year

$560 to $700 Lifetime Savings

[10] *Duke Energy® Progress*. progress-energy.com.
[11] Ibid.
[12] Energy Star.gov. Based on 12-year life and 4 % discount rate. Actual savings will vary depending on use.

Energy Star-Qualified Refrigerator and Freezer Products

Eligible products	Examples	Ineligible products
Solid, Glass Plus Mixed Solid/ Glass Door Refrigerators And Freezers	Reach-In, Roll-In Or Pass-Through Units; Merchandisers; Under-Counter Units; Milk Coolers; Back Bar Coolers; Bottle Coolers; And Beer-Dispensing Or Direct Draw Units	Drawer Cabinets, Prep Tables Or Deli Cases; Open Air Units; Laboratory-Grade Equipment; And Refrigerator/ Freezer Combination Units

By Conserving Energy, We All Win

Maintaining, retrofitting and/or upgrading your refrigeration equipment is not only a great way to reduce your energy usage– it's good for business, and good for all businesses that count on the electrical grid for power.

For more help in saving energy and a list of eligible equipment, contact your Account Manager or visit sce.com/business

Additional Resources

Food Service Technology Center.
fishnick.com

U.S. Department of Energy, Federal Energy Management Program.
eere.energy.gov/femp/procurement

***Facility Type: Supermarkets and Grocery Stores.* Energystar.gov, January 2008.**
energystar.gov/sites/default/files/buildings/tools/EPA_BUM_CH11_Supermarkets.pdf

Interested In Learning More?

Choose from the many topics in our Energy Conservation Series:

- LED Lights: A Bright New Way to Conserve Energy
- Plug In To Greater Energy Savings— With Smart Plug Load Management
- Switch To a More Energy-Efficient Business—With Smart Lighting Controls
- Manufacturing Motors & Compressors: Start Your Energy-Efficient Engines
- On the Menu: Major Energy Savings With Restaurant Refrigeration
- Energy Efficiency Is In the Air: Optimizing Your HVAC
- Agricultural Pumping: Pumped and Primed to Save Energy

SOUTHERN CALIFORNIA EDISON®
An EDISON INTERNATIONAL® Company

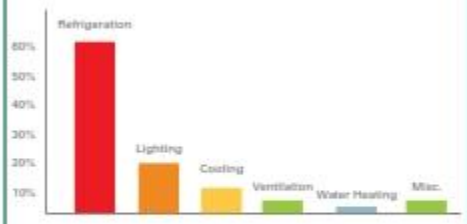
Energy Management Solutions
Grocery/Convenience
< 200 kW

Powerful Solutions That Put You in Control

Ready to make your grocery and/or convenience store more energy and cost efficient? It's easier than you think. Start with simple, no-cost actions that instantly conserve energy, and then consider highly efficient refrigeration and lighting upgrades that will permanently reduce energy consumption. We invite you to take advantage of tools, tips, and financial incentives—all customized for businesses like yours, to help you save energy and enhance your customer's experience and comfort. Consider us your source for energy management solutions, with the resources you need to get started.

Grocery & Convenience Electricity Use[1]

Refrigeration	60%
Lighting	18%
Cooling	11%
Ventilation	4%[1]
Water Heating	2%[1]
Miscellaneous	5%



1 Source: National Renewable Energy Laboratory 2008 (average industry numbers)

FOR OVER 100 YEARS...LIFE. POWERED BY EDISON.

Make a Savings Plan

Grocery and convenience stores have unique needs and narrow margins, so energy savings can make a big difference. Knowing where you use energy can help you identify ways to reduce your use and control your overhead. We can help. Simple modifications to your operations and keeping up with equipment maintenance can have a significant effect on your energy use and costs. Visit us at **sce.com/businessadvisor** and learn more about how you use energy and simple steps that can help improve your bottom line.

EliminateEnergyGuzzlers

Consider participating in our **Express Solutions** or **Customized Solutions** programs, developed with your industry in mind. Investments in new, energy-efficient equipment like **refrigeration** and **lighting**, infrastructure improvements, and facility upgrades pay off in the long term—and many qualify for incentives right now.

Demand Response

Demand Response rewards you for reducing energy usage when demand for electricity is highest — typically the summer months — and when rates are highest, too. If your business has the flexibility to shift energy usage, you could plug into serious savings. We offer several Demand Response programs so that you can choose the best options based on your business needs.

Sign up for the **Summer Advantage Incentive** and get rewarded for voluntarily reducing electricity consumption

or for shifting usage to off-peak hours during "event" days when energy conservation during peak hours is most needed. Or, save with our **Commercial Summer Discount Plan** which automatically cycles your air conditioner units on and off during periods of peak demand. With **Automated Demand Response**, you can reduce with a click, so it's even easier for you to save both time and money. Want more control over when—and how much—you reduce your demand? Consider our **Demand Bidding Program**, which does not include penalties for non-performance, or the **Capacity Bidding Program**.

"My business is typical of the small groceries and liquor stores—family-owned and operated in a forty-year-old building with much of its original equipment for lighting and refrigeration. My power bill ran as much as $1,800 during the summer months. SCE alerted me to how the Express Solutions Program offers upgrades that could cut my bill. And soon I was saving hundreds of dollars on my SCE bill—what a difference small measures can make for us."

James Kim, President, Owner,
Valencia Liquor

Small Steps to Control Your Energy Expenses

A few targeted changes in your operations and equipment maintenance procedures can really add up. Many ways to save require little or no financial investment by your company.

Keep Your Cool

Refrigeration is one of the biggest energy guzzlers in convenience and grocery stores. Simple upgrades to your refrigeration systems can reduce energy use by 24% relative to standard practice[2] and make a big impact on your bottom line.

- Install **refrigeration curtains** and **auto door closers**
- Add **temperature controllers**
- Insulate bare suction lines
- Add **display shields**
- Replace existing shaded pole on evaporator fans with electrically commutated **motors**

Flip the Switch

Brighten your business forecast by dimming the lights...or at least swapping your incandescent bulbs for energy-efficient **LEDs**. You'll be surprised how much lighter your energy load will be.

- For stores that remain open 24 hours a day, install **occupancy sensors** in general usage areas so that lights turn on only when an area is occupied, and automatically turn off when it isn't
- Install **dimmable ballasts** to control the current passing through fluorescent lamps. Lower light levels use less energy, and dimming enhances employee comfort
- Changing refrigerated display case lighting to **LEDs** can save energy and has been shown to appeal to customers significantly more than linear fluorescent lamps

Power Tools for Long-Term Savings

One-Stop Shop

My Account is your business energy-use command center, where at a glance you can view usage history charts, track your current use and your projected bill, and access your daily demand report. Having all the information about your energy use—past and present—is a powerful tool to help plan your budgets and find ways to conserve and save in the future.

Take the Guesswork Out of Your Monthly Bill

To help you stay in control of your costs, My Account also includes **Budget Assistant**, a free and easy-to-use tool to help you plan and manage your bill, and keep you within budget. You can set monthly spending goals online, and set alerts to keep you on track. Budget Assistant monitors your usage for you, and gets in touch—by your choice of phone, email or text—with automated updates for a whole new level of convenience and control.

[1] Source: Data from the U.S. Energy Information Administration (2003)

To learn more about Energy Management Solutions and apply for incentives, visit **sce.com/grocery** or call your SCE Account Manager.

C-5060 | NR-301-V1-0613

APPENDIX C: INTER-RATER RELIABILITY ANALYSIS

Store ID	City	Primary Coder	Coder 1	Coder 2	Coder 3	Coder 4	Percent Agreement
1	Los Angeles	0	0	1	1	1	75%
2	San Francisco	0	0	1	0	1	50%
3	San Francisco	0	0	0	0	0	100%
4	San Francisco	0	0	0	0	0	100%
5	San Francisco	0	0	0	0	0	100%
6	Los Angeles	0	0	0	0	0	100%
7	Los Angeles	0	0	0	1	1	50%
8	Los Angeles	0	0	0	0	0	100%
9	San Francisco	0	0	0	0	0	100%
10	Los Angeles	0	0	0	0	0	100%
11	Los Angeles	1	1	1	1	1	100%
12	Los Angeles	1	1	0	1	1	75%
13	Los Angeles	1	1	1	1	1	100%
14	San Francisco	1	1	1	1	0	75%
15	San Francisco	1	1	1	1	1	100%
16	Los Angeles	1	0	1	1	0	50%
17	San Francisco	1	1	1	1	1	100%
18	San Francisco	1	1	1	1	1	100%
19	San Francisco	1	1	1	1	1	100%
20	Los Angeles	1	1	1	1	0	75%
						Average Agreement:	87.50%
						Fleiss' Kappa:	*0.64*

APPENDIX D: INFORMATION INFORMING ANALYSIS

NAICS Code Count and Descriptions for San Francisco County and Los Angeles County

NAICS	County	Count	Description
445000	San Francisco	1	Food and beverage stores
445100	San Francisco	6	Grocery stores
445110	San Francisco	18	Supermarkets and other grocery excluding convenience stores
445120	San Francisco	3	Convenience stores excluding gas retailers
445310	San Francisco	8	Beer, wine, and liquor stores
722000	San Francisco	1	Food services and drinking places
None assigned	San Francisco	1	—
445110	Los Angeles	4	Supermarkets and other grocery excluding convenience stores
445120	Los Angeles	22	Convenience stores excluding gas retailers
445299	Los Angeles	2	Specialty food stores
445310	Los Angeles	45	Beer, wine, and liquor stores
453991	Los Angeles	2	Tobacco stores
531120	Los Angeles	1	Commercial building rental or leasing
531128	Los Angeles	1	Commercial building rental or leasing
531129	Los Angeles	1	Commercial building rental or leasing
722410	Los Angeles	1	Alcoholic beverage drinking places
None assigned	Los Angeles	3	—

Output for regressing Poverty Level on Corner Store (Total and by county)

	Dependent variable:
	Percentage of People in Poverty (All)
Corner Store	4.039***
	(0.701)
Non-corner Store (Constant)	17.878***
	(0.203)
Observations	2,938
R^2	0.011
Adjusted R^2	0.011
Residual Std. Error	10.543 (df = 2936)
F Statistic	33.194*** (df = 1; 2936)
Note:	*p<0.1; **p<0.05; ***p<0.01

	Dependent variable:
	Percentage of People in Poverty (San Francisco County)
Corner Store	0.387
	(1.188)
Non-corner Store (Constant)	14.496***
	(0.206)
Observations	962
R^2	0.0001
Adjusted R^2	−0.001
Residual Std. Error	6.302 (df = 960)
F Statistic	0.106 (df = 1; 960)
Note:	*p<0.1; **p<0.05; ***p<0.01

	Dependent variable:
	Percentage of People in Poverty (Los Angeles County)
Corner Store	3.179***
	(0.840)
Non-corner Store (Constant)	19.674***
	(0.279)
Observations	1,976
R^2	0.007
Adjusted R^2	0.007
Residual Std. Error	11.701 (df = 1974)
F Statistic	14.317*** (df = 1; 1974)
Note:	*p<0.1; **p<0.05; ***p<0.01

APPENDIX E: IOU DATA REQUEST METADATA

Variable Name	Description
obs_num	Uniquely identifying observation number
business_name	Business name
address	Address (Format: 1234 Street, City, State, ZIP)
ee_participant	Whether this business/address has participated in energy efficiency programs
naics	NAICS code of the business
jan_2015	Energy use by this business for January 2015
feb_2015	Energy use by this business for February 2015
mar_2015	Energy use by this business for March 2015
apr_2015	Energy use by this business for April 2015
may_2015	Energy use by this business for May 2015
jun_2015	Energy use by this business for June 2015
jul_2015	Energy use by this business for July 2015
aug_2015	Energy use by this business for August 2015
sep_2015	Energy use by this business for September 2015
oct_2015	Energy use by this business for October 2015
nov_2015	Energy use by this business for November 2015
dec_2015	Energy use by this business for December 2015
jan_2016	Energy use by this business for January 2016
feb_2016	Energy use by this business for February 2016
mar_2016	Energy use by this business for March 2016
apr_2016	Energy use by this business for April 2016
may_2016	Energy use by this business for May 2016
jun_2016	Energy use by this business for June 2016
jul_2016	Energy use by this business for July 2016
aug_2016	Energy use by this business for August 2016
sep_2016	Energy use by this business for September 2016
oct_2016	Energy use by this business for October 2016
nov_2016	Energy use by this business for November 2016
dec_2016	Energy use by this business for December 2016
jan_2017	Energy use by this business for January 2017
feb_2017	Energy use by this business for February 2017
mar_2017	Energy use by this business for March 2017
apr_2017	Energy use by this business for April 2017
may_2017	Energy use by this business for May 2017
jun_2017	Energy use by this business for June 2017

jul_2017	Energy use by this business for July 2017
aug_2017	Energy use by this business for August 2017
sep_2017	Energy use by this business for September 2017
oct_2017	Energy use by this business for October 2017
nov_2017	Energy use by this business for November 2017
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