Recommendations for Energy Efficiency Programs to Better Serve Latino Households

February 2018

Prepared for
California Energy Commission, Grant #EPC-14-037

Center for Sustainable Energy®

This report was prepared by the Center for Sustainable Energy. It is a component of Grant #EPC-14-037, funded by the California Energy Commission, to explore the sociocultural factors influencing the adoption of home energy efficiency retrofits in California. Match funding was provided by Energy Upgrade California® and Center for Sustainable Energy.

Cite this reference as Parsons, L., Vine, E., Dethman, L., Arreola, G., and Moezzi, M. 2018. "Recommendations for Energy Efficiency Programs to Better Serve Latino Households." Center for Sustainable Energy.

Contents

I. Executive Summary

In 2014, the California Energy Commission released a funding opportunity to conduct research to better understand how social, cultural and behavioral factors affect adoption of energy efficiency. Through this funding, our team[1] conducted a multi-year study to meet the following goals:

- Increase the understanding of the role that sociocultural factors (e.g., values, customs, attitudes, demographics) play in the adoption of energy efficiency measures, especially in underserved residential markets in California.
- Explore how to increase the adoption of energy efficiency measures through messaging and framing that resonates with a targeted underserved population.
- Inform improvements for the design and implementation of residential energy efficiency programs, both for the targeted population and other audiences as well.

In the early phases of our research, we chose to focus our research on the state's Latino population, which is a large and growing part of California's sociocultural landscape. Our research methods included a literature review, market characterization, focus groups, semi-structured interviews, survey, online experiments and field experiments; detailed discussions of each of these activities are available at www.energycenter.org/sociocultural.

Based on our research findings, we recommend the following strategies to help energy efficiency programs better serve the complex Latino market.[2]

Program Outreach Recommendations

1. Partner with community-based organizations (CBOs) as trusted messengers.
2. Take a bilingual approach, especially for populations with low acculturation.
3. Use imagery that resonates with the target audience.
4. Use personal stories to demonstrate what's achievable to lower energy bills.

Program Design Recommendations

5. Address individual concerns, motivations and learning styles in a personalized way.
6. Design programs to facilitate upgrade work by a broader network of contractors and DIY homeowners.
7. Offer options for low-income households through varied financing options, phased whole-house retrofit programs, low-cost recommendations and expanded direct install programs.

[1] The research team was led by the Center for Sustainable Energy and included Research Into Action, Ghoulem Research and Edward Vine.

[2] While our findings focus on areas of similarities among Latinos, rather than areas of differences, it is important to note that Latino households are not a homogeneous population across the United States or even across California.

8. Create regional one-stop shops to integrate energy efficiency retrofits with other sustainability, health and safety improvements.

Research Recommendations

1. Evaluate program design and outreach recommendations.
2. Conduct research to understand the opportunities and limitations of housing stock and behavior patterns in different communities.

II. Introduction

In 2014, the California Energy Commission released a funding opportunity to conduct research to better understand how social, cultural and behavioral factors affect adoption of energy efficiency. Given that many energy efficiency programs geared toward the general population (i.e., not income-qualified), particularly whole-house retrofit programs, disproportionately serve high-income, college educated and white (non-Latino) audiences (Frank and Nowak, 2016), our team[3] designed, and received funding for a multi-faceted, multi-year study (May 2015 to March 2018) to meet the following goals:

- Increase the understanding of the role that sociocultural factors (e.g., values, customs, attitudes, demographics) play in the adoption of energy efficiency measures, especially in underserved residential markets in California.
- Explore how to increase the adoption of energy efficiency measures through messaging and framing that resonates with a targeted underserved population.
- Inform improvements for the design and implementation of residential energy efficiency programs, both for the targeted population and other audiences as well.

After reviewing the literature and other information for three prominent racial/ethnic groups in California, we chose to focus our research on the state's Hispanic and Latino[4] population, which is a large (39%) and growing part of California's sociocultural landscape. Thus, if state and local governments are to meet their ambitious greenhouse goals, policymakers and program implementers will need to robustly engage California's Latino population in energy efficiency activities.

In this report, after summarizing our research phases and methods, we present the conclusions and recommendations from our research. While we primarily focus on how to create energy efficiency programs that better serve the complex Latino market, a number of our conclusions and recommendations apply beyond the Latino population. A full discussion of our research can be found at www.energycenter.org/sociocultural; a final report will be published in spring of 2018.

[3] The research team was led by the Center for Sustainable Energy and included Research Into Action, Ghoulem Research and Edward Vine.

[4] The federal government defines "Hispanic or Latino" as a person of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin regardless of race (Humes, Jones, & Ramirez, 2011). For the sake of simplicity, we refer to this population as "Latino" throughout the remainder of this report.

III. Research Methods

Figure 1 shows the path of our research over time and how it employed both secondary and primary data, as well as an array of qualitative and quantitative methods. Due to a concentration of Latino households, we conducted most of our research in two California counties – Fresno and San Diego – with some research conducted in other parts of the state.

Figure 1. Research Components and Phases

1. Literature review

In the first research phase, we conducted a literature review examining characteristics of the three California populations: Latinos, Asian Americans and African Americans. The goal of this review of more than 60 academic, program evaluation and other references was to better understand the demographic and housing characteristics, energy use patterns, family decision-making patterns, effective messages and message delivery strategies for the target populations.

Based on this review, we chose to focus on the Latino population for the remainder of the research because:

- Latinos represent 39 percent of California's population, and is expected to increase substantially.
- Latinos accounted for 56% of the net growth of homeownership between 2010 and 2013.
- The Latino population's geographic dispersion and language use (primarily English or Spanish, compared to Asian Americans who collectively speak many languages) facilitated our survey and field research activities.

2. Market characterization

To choose robust geographic areas for our study, we first analyzed residential heating, ventilating and air-conditioning (HVAC) change-outs recorded by CalCERTS, a Home Energy Rating System Provider that tracks diagnostic testing required for HVAC installations; demographic and building characteristic data from the American Community Survey; and census block group level voting records from the Statewide Database maintained by the University of California – Berkeley School of Law. Based on this analysis, we chose to target San Diego and Fresno counties, since they have substantial HVAC replacement activity and large Latino communities and many census block groups where over 25% of the population speaks Spanish at home. Furthermore, these counties have significant overlap with Investor Owned Utility (IOU) territories, a geographic requirement tied to the funding source, and a diversity of climate zones.

3. Focus groups with homeowners

The goal of the focus groups was to identify sociocultural characteristics of Fresno and San Diego Latino households that shape how they think about executing and financing home improvement projects, with a focus on energy and energy efficiency improvements. We conducted four focus groups in Spring 2016: two in Fresno and two in San Diego. All focus group participants were homeowners who had hired someone from outside the household to complete a large home improvement project within the past 5-7 years.

In each location, one focus group included participants who self-identified as Latino and felt comfortable speaking in Spanish; the other group included participants who self-identified as non-Latino and were comfortable speaking in English.[5] Research companies specializing in focus groups recruited and hosted the groups in each locality.

4. Semi-structured interviews with contractors

The goal of these interviews was to understand contractors' views on how Latino households think about energy and energy efficiency in planning, executing, and financing home improvements. In Spring 2016, we interviewed, by phone, seven contractors or home energy raters working with single-family owner-occupied homes in San Diego County, Fresno County and Kern County[6]. We recruited most respondents from the network of contractors associated with the Center for Sustainable Energy (CSE), though we obtained some through cold calls and referrals from other interviewees. The contractors represented different business sizes and models, focused on home improvements for which energy implications are generally high, and were experts with a broad understanding of the market, including Latino households. Interviews lasted from 30 minutes to over one hour.

[5] The script used to screen participants is included in Appendix A in the Final Report. (Research Into Action, Inc. & Center for Sustainable Energy, 2016)

[6] We included one contractor from Kern County due to difficulty recruiting contractors that met our criteria in San Diego and Fresno counties.

5. Survey of homeowners

In Summer 2016, we conducted a survey to understand Latino and non-Latino homeowner perspectives about home improvement projects, energy efficiency, thermal comfort, hiring contractors, using financing and making major household decisions. We used the San Diego County and Fresno County assessors' databases to construct the sampling frame, filtering for single-family parcels and owner surnames for which at least 75% of American Community Survey respondents self-identified as Latino. We sent five rounds of bilingual invitations by mail. We offered the questionnaire in English and Spanish, with the option to log onto a website to complete it online or fill out a paper version to be returned by mail. We received survey responses from 697 owners of single-family homes. Of those respondents who provided their ethnic status, 79% were Latino and 21% were non-Latino.

6. Online experiments with homeowners

In Fall 2016, we conducted online experiments to understand how various messages affected the likelihood that Latino and non-Latino homeowners would take action on home energy efficiency upgrades. We conducted four rounds of experiments; in each round, an online panel provider recruited 800 California owners of single-family homes, including 400 Latinos and 400 non-Latinos, to participate in exchange for monetary compensation. The first three experiments tested the effects of the following message themes on participants' likelihood to choose to learn more about installing attic insulation: (1) comfort benefits vs. cost savings, (2) family emphasis vs. untargeted, and (3) English only vs. bilingual (English and Spanish) presentation. The fourth experiment tested the effects of the following themes on participants' likelihood to choose to see a list of contractors that can help with home energy efficiency upgrades: utility representative messenger vs. local homeowner messenger, and contractor license status vs. untargeted.

7. Field experiments with audit recipients and potential audit recipients

In Spring and Summer 2017, we conducted three field studies in partnership with the Central Valley Energy Tune-Up (CVETU) program, which provides no-cost home energy audits to Pacific Gas and Electric customers in California's Central Valley[7]. The first two studies were experimental designs: one testing the impact of imagery in the CVETU audit recruitment brochure on audit sign-ups, and one testing the impact of providing do-it-yourself (DIY) tips and Property Assessed Clean Energy (PACE) financing information on the likelihood to conduct upgrades post-audit. The second experiment did not yield a useable sample size, so we executed a third, ethnographic study in which we conducted English and Spanish phone interviews with audit recipients about upgrade activity, motivations and barriers.

[7] Due to resource constraints, we could only conduct our field studies in one geographical location.

IV. Conclusions and Recommendations

These conclusions and recommendations, based upon our research, are intended to help policymakers, local governments, utilities, contractors, auditors and other program stakeholders better serve households as they pursue energy efficiency in their homes. Like all households, Latino households are far from homogenous across California, much less the United States; they can be characterized by a variety of factors – e.g., level of acculturation, family country of origin, income, occupation, local climate and more, any of which may influence attitudes and practices concerning energy use and energy efficiency. The recommendations are derived from patterns and tendencies that the analyses found were common in the Latino households studied. Some of these recommendations are specific to the Latino audience; some apply broadly to low- and moderate-income households, or even to improving energy efficiency programs and research for any audience.

Program Outreach Recommendations

1. **Partner with community-based organizations (CBOs) as trusted messengers.**

The research revealed mixed perceptions of energy utility companies among Latino homeowners. The literature review found an example of a focus group study that showed low-income Latinos had low levels of trust in their energy utilities, and the online experiment study noted that Latino participants were less likely than non-Latino participants to respond to a utility messenger promoting the benefits of attic insulation.[8] On the other hand, Latino members of the focus groups, who had hired contractors to do major home renovations, revealed high awareness of and participation in energy and water utility programs.

These mixed findings suggest that some pockets of Latino households are responsive to utility efficiency programs, but that other segments of Latinos know very little about these programs and have generally not participated in these programs. Also, research shows that even for households with positive impressions of their local utility, programs often need to reach out to potential participants multiple times before they are ready to act, and partnering with local, trusted organizations may extend and amplify a message's reach (U.S. Department of Energy, 2017).

Recommendation: Energy efficiency program funders and implementers should partner with community-based organizations (CBOs) – such as cultural and faith-based organizations, neighborhood associations, low-income assistance organizations or environmental justice groups – that have established relationships with Latino households. These partnerships can leverage the energy program's technical expertise and the CBO's cultural expertise, reputation as a trusted messenger and access to

[8] A subsequent analysis of additional demographic variables revealed that the partial effect of Hispanic/Latino ethnicity was no longer statistically significant in explaining why households install attic insulation, and in fact, the variable most salient in predicting a positive response to installing attic insulation were education, gender and presence of children in the home.

large social networks. CBOs should be widely known in the target community and not strongly aligned with any single subgroup that would limit its effectiveness with the broader community (Reed et al. 2001). In particular, CBOs can provide outreach or non-monetary assistance to help promote energy efficiency. If a CBO is experienced in delivering services, the organization could be enabled – through training and resources – to help deliver energy efficiency services along with its traditional offerings. If a CBO already offers other services, this type of partnership could also provide cross-sector benefits such as helping with air quality or financial issues (see Recommendation #8).

2. Take a bilingual approach, especially for populations with low acculturation.

In the interviews with contractors, a range of perspectives was expressed on the importance of Spanish-speaking staff for serving Latino customers. Some noted that bilingual staff can help establish trust and comfort – especially with older family members – even when the customer has a reasonable knowledge of English. Latino focus group participants also expressed that messaging should be in both English and Spanish to reach the largest Latino audience, since some older people do not read English, while their children may not want to learn Spanish. The survey revealed that more than one-third of Latino respondents considered the ability to conduct business in their preferred language to be extremely important when selecting a contractor. In the interviews conducted with CVETU audit recipients, several participants mentioned that language barriers limited their ability to find contractors or find additional information on pursuing energy upgrades (Arreola, Moezzi and Parsons, 2017).

The effects of language on energy efficiency decision-making were further explored through the online experiments. The experiments presented two versions of the same message about the benefits of attic insulation: one in English and one in both English and Spanish side-by-side. This research suggested that Latino participants with low levels of acculturation were more likely to choose to talk to an energy specialist when presented with bilingual messaging than participants who were more highly acculturated. Importantly, the bilingual messaging did not influence non-Latino participants' likelihood to choose to talk to an energy specialist, indicating little downside of using both languages in marketing materials.[9]

Recommendations: Present all marketing materials and websites in both English and Spanish, and employ bilingual staff – preferably native speakers. Language (e.g., printed materials and phone scripts) should be reviewed by native speakers to ensure the translation is accurate, effective and contains the appropriate vernacular. In an ethnographic study of California Latinos and energy use, energy efficiency program experts mentioned that outreach must use the "right" Spanish – i.e., reflecting both cultural awareness and an accurate use of technical terms (Inova Energy Group, 2017). Programs that partner with community-based organizations (see Recommendation # 1) may also be able to leverage their experience communicating effectively in Spanish. To gauge the importance of providing bilingual

[9] The online experiments also asked participants to rank 12 contractor attributes in order of importance. The ability to conduct business in their preferred language was ranked last, somewhat contradicting the results of our survey (Center for Sustainable Energy, 2017).

materials, programs can use census data to identify the primary languages spoken at home in each census tract.

3. **Use imagery that resonates with the target audience.**

Programs with limited marketing resources may rely on a few images across their marketing materials. However, the research conducted in this study shows it is a wise investment to use a more diverse selection of images that reflect the appearances of their varied target audiences and their homes, so that the target audience can "put themselves in the picture." In the focus group of Latino homeowners in Fresno, some participants reacted negatively to an energy efficiency financing advertisement that featured a relatively large, expensive-looking home. One participant said, "It looks like they are in their big house – they could save, but I couldn't (Research Into Action, Inc. and Center for Sustainable Energy, 2016)."

The impact of imagery was tested further through a field experiment in which CVETU canvassers distributed two versions of the same brochure when recruiting participants for their no-cost energy audits. The researchers found that the brochure with images of people who appeared Latino in front of modest homes (as compared to the brochure with Caucasians in front of large, expensive homes) had a positive impact on audit sign-up rates in census tracts with high concentrations of Latinos (Arreola, Moezzi, and Parsons, 2017). This aligns with other research that has found that customers identified more with advertisements when people of their ethnicity were featured (Lee et al., 2002).

Recommendations: Given the relatively low cost to update marketing materials, adopt imagery to match target populations wherever possible. Programs can identify neighborhoods with high concentrations of Latino residents through census data. Appropriate pictures can be purchased through stock photography sites or acquired from actual program participants who had a good experience and agree to release their images for marketing purposes. Using real program participants from neighborhoods close to the target audience also can tap into social norming effects, where a person's behavior is influenced by the accepted standards of behavior of one or more social groups.

4. **Use personal stories to demonstrate what's achievable to lower energy bills.**

Interviews conducted in this research project with audit recipients revealed that some households may not view discomfort or high energy bills as "fixable" problems, but rather as conditions to be endured. These households are unlikely to seek out energy audits or energy efficiency program assistance. These issues will have even greater impact as average temperatures continue to rise in coming years, potentially exacerbating health issues and/or high electric bills that accompany the cooling season.

Recommendations: Offer free or heavily subsidized energy audits to "get in the door," and market those audits through convenient, personal interactions that do not depend on the target audience seeking out energy-specific services. The CVETU program, achieves strong audit enrollment rates through door-to-door recruitment. Working with a local CBO (see Recommendation #1) also will help ensure access to hard-to-reach households and the opportunity to discuss how efficiency can improve comfort and lower bills.

Audits, of course, are just the first step. To help bridge the gap between audit and upgrades, programs need to use a variety of strategies to illustrate that efficiency improvements are achievable and bring tangible benefits. Demonstrations – in the form of walk-through tours of homes that have completed energy efficiency upgrades – can help homeowners visualize improvements in their own homes (Office of Efficiency and Renewable Energy). Short and inspiring testimonials, online videos and blogs can create interest and buzz. Case studies (e.g., 1-2 page handouts or short videos, presented bilingually) can provide more images and details about actual project experiences (including completed project measures and costs, contractors used, estimated savings, rebates or financing used, and quotes from the residents about the comfort, health or other benefits resulting from the upgrades).[10] These examples should come from the local community, to show that projects are possible for the target audience and to leverage social norming effects.

Program Design Recommendations

5. Address individual concerns, motivations and learning styles in a personalized way.

Interviews with CVETU participants revealed common barriers to executing upgrades based on the results of an energy audit. While CVETU provided many tips and resources in its audit reports (presented in either English or Spanish, depending on the household's preferred language), some interviewees indicated that they still did not know what to do with the suggestions. This challenge may be related to different learning styles; for example, some people may process information more effectively if presented with a conversational, personal approach. Many auditors do, in fact, take this approach while they are in the home: they engage the resident in conversation about their home and family. Contractors also indicated that they enjoy explaining energy efficiency concepts and recommendations during energy audits.

Recommendations: The following strategies can help auditors and other program staff address the individual concerns, motivations and learning styles of a given homeowner or resident,[11] with the goal of overcoming barriers to action more quickly.

- Provide audit results, upgrade recommendations and information on resources in a written report in the homeowner's preferred language. Include images of their home and systems where possible.
- Make follow-up calls in the homeowner's preferred language. Ideally, the call would be conducted by the auditor who examined the home firsthand and has already established rapport with the homeowner. This may require additional training for auditors on phone etiquette, evaluating and hiring contractors, financing options and rebate program requirements.

[10] An example of a case study for a neighborhood demonstration home can be found on CSE's website at https://energycenter.org/energy-efficiency-florey-home-case-study.

[11] If the home is owner-occupied, the owner and resident are the same.

- During an audit, engage homeowners in a discussion about the concerns they have about their home or equipment.
- Ask homeowners to be available during audit visits, so that the auditor can show them any visual signs of poor home performance – e.g., thin or bunched attic insulation, gaps in air barrier or ducts, dirty HVAC filter, etc. If the homeowner cannot access all spaces (attic, crawl spaces, etc.), the auditor should photograph the conditions and share the photos with the homeowner to illustrate the poor condition. These photographs should be included in any post-audit report.
- Gauge the homeowner's readiness to act, and determine whether they would be more interested in hiring a contractor vs. doing the project themselves, and (if comfortable discussing finances) whether they would need financial help via rebates, loans or direct install programs.[12]
- Use infrared (IR) images – both to show the energy savings opportunities to homeowners while onsite and to include in a report. IR images were mentioned as particularly memorable by audit recipient interviewees (Arreola, Moezzi, and Parsons, 2017).
- Provide auditors with one-page case studies of energy efficiency upgrades from the community to demonstrate the savings potential in their homes (see Recommendation #4).
- Add fields in the auditor's data collection platform to record the homeowner's areas of interest or concern, so program staff can provide specific, actionable recommendations in follow-up calls.
- Plan for a second round of follow-up calls several months after the first round, as homeowners often do not have the time, money or motivation to immediately act on their audit results.

While providing personalized guidance to program participants can be resource-intensive, programs can leverage the time that auditors, contractors and outreach staff are already spending in personal interactions by providing the training and data-collection platforms described previously. This approach may be best suited for programs that seek to achieve significant energy savings in a smaller number of households (as opposed to programs designed to effect small energy-saving actions in many households), and to be involved in that community for the long-term.

6. Design programs to facilitate upgrade work by a broader network of contractors and DIY homeowners.

Many whole-house energy efficiency upgrade programs require homeowners to use contractors who have been officially vetted by the utility. The eligibility criteria for contractors are intended to ensure high quality of work, proper insurance coverage and appropriate license stature. Building envelope, HVAC and water heater retrofits can have serious combustion safety and air quality implications if not executed correctly.

Unfortunately, the requirement to use a participating contractor may not align with the way many Latino households approach home improvement projects. Throughout several phases of this research

[12] Direct install programs can be performed as part of an energy audit or as a standalone service. They typically employ program-approved contractors to install prescriptive energy efficiency measures at low or no cost to the customer.

project, the team found that Latino households are likely to conduct projects themselves (i.e., DIY projects), or use their personal network to find someone to do the work, even if that person is not officially licensed or formally trained in a relevant specialty.

In the focus groups, which were limited to homeowners who had previously hired someone to help with a home improvement project, several respondents from both the Latino and non-Latino groups reflected their desire to attempt certain projects if they had the skills and time. Participants indicated they were less likely to take on projects involving electricity, plumbing, steep roofs, permits or simply a larger, more complex scope.

The survey revealed that foreign-born Latino respondents were much more likely to use DIY or get help from unpaid family or friends compared to U.S.-born non-Latino respondents. Furthermore, Latino respondents were significantly less likely to have ever hired a contractor for home improvement or repair compared to non-Latino respondents.

Finally, interviewees from the field research overwhelmingly mentioned relying on family members or others in their network who could do the work or could refer them to somebody who could. One said, "Honestly, because we have our family in construction, it's very easy for me to say hey, do you know somebody who can do this?"

Programs may better reach the Latino population by acknowledging that many are not inclined to use unfamiliar contractors on the approved list, and the programs should provide alternate pathways to participation.

Recommendations: Facilitate DIY work, and help ensure its quality, by offering low-cost trainings, mentoring, streaming video tutorials, equipment lending libraries, quality assurance checks, and/or audits to inform work scope.[13] In addition to facilitating DIY work, programs can better engage Latino households by ensuring approved contractor lists include contractors from the local Latino community. Contractor outreach efforts can be improved in some of the same ways mentioned for homeowner outreach: by partnering with community-based organizations and using culturally-relevant, bilingual messaging.

[13] A small pilot program implemented by Central Vermont Community Action Council and Efficiency Vermont in 2011 demonstrated the potential for this approach. The program focused mostly on attic air sealing and provided DIYers with a day-long skills training as well as a professional audit report, mid-term inspection and final inspection by an auditor to ensure quality. Its messaging to potential participants was "You can do it. We can help." (U.S. Department of Energy, 2012). Another pilot program, RePower Bainbridge from Washington State, offered DIY options and used checklists as a resource to help participants. And the California Solar Initiative – Thermal program allows self-installers to claim rebates for their solar water heating systems as long as they complete the same workshop required for contractors to be eligible for the program. Although less than two percent of CSI-Thermal projects in SDG&E territory have been self-installs, program staff report anecdotally that they are often the highest quality because the DIY crowd takes great pride in their workmanship and their own home.

7. **Offer options for low-income households through varied financing options, phased whole-house retrofit programs, low-cost recommendations and expanded direct install programs.**

Access to capital is a primary barrier to whole-house energy efficiency retrofits for many households (Fuller et. al, 2010). Financing may be helpful for some Latino households, but this study found mixed perspectives on the Latino appetite for financing, and it should not be viewed as a silver bullet for improving program participation.

On the one hand, the literature review indicated that Latino Americans may be less likely to trust banks and have a cultural tendency to use cash rather than credit. The Latino (as well as non-Latino) focus group participants reflected some reluctance to use financing for high cost items. In interviews with CVETU audit recipients, only 20% seemed willing to consider taking out a loan for energy efficiency upgrades. Some expressed reluctance to take on debt: "I can't afford [attic insulation] right now. I almost lost my house already. I [had] to get a loan for it. So I'm paying on my loan right now… it's hard for me to do anything with my house."

Alternatively, when survey respondents were asked about how they would proceed with a desired (non-emergency) home improvement project if cash were not available but financing were, 50% of foreign-born Latinos and 40% of U.S.-born Latinos reported that they would use financing to complete the project rather than wait to save up the cash. (This was higher than the 37% of U.S.-born non-Latinos who reported they would use financing.) Similarly, Latino respondents agreed more with the statement "I am more likely to consider a large purchase if I know that there is financing available to help me pay for it" than non-Latino respondents.

However, the research also found the respondents who expressed more desire to use financing may be the ones less likely to be approved for financing. In the survey, foreign-born Latinos reported more trouble accessing credit than the other groups. Additionally, while the survey and focus groups discussed financing in terms of home improvement projects more generally, the field research interviews were specific to energy efficiency upgrades recommended for the interviewees' homes. It is possible that any appetite for taking on debt for home improvement projects is reduced when considering energy efficiency upgrades specifically.

Recommendations: Although access to capital is a barrier to engaging in major energy efficiency upgrades, programs can still engage with Latino households through the following mechanisms:

- Offer varied financing options such as property assessed clean energy (PACE), where financing is tied to home equity rather than personal credit), on-bill financing, local credit union loans or the California Hub for Energy Efficiency Financing (CHEEF) pilot programs[14]. The options will vary based on whether the barrier to traditional financing is based on personal credit, ease of enrollment/repayment or trust in lending institutions. The previously listed program outreach

[14] The California Hub for Energy Efficiency Financing (CHEEF) is a public-private partnership among state agencies, utilities, lenders, contractors, and borrowers. Its goal is to increase the availability of lower-cost financing for energy efficiency investments throughout the state (California Hub for Energy Efficiency Financing, 2017)

recommendations also should be applied to any financing offerings, to ensure they are personalized and relevant to the target audience.

- Offer phased approaches to whole-house energy efficiency upgrade programs – this can help homeowners break major projects into more manageable pieces over the course of several years without sacrificing access to full incentive amounts. This differs from Energy Upgrade California® Home Upgrade[15], as a prominent example, which requires fundamental building envelope upgrades to be included in projects. If a homeowner can afford to layer in additional upgrades (such as a high efficiency HVAC or water heater) at the same time as the envelope upgrades, the rebate amount grows. However, the homeowner would not be able to claim the extra rebate amount if they replaced the HVAC or water heater later.
- Offer recommendations for low-cost measures (e.g., changing lightbulbs, HVAC filters or showerheads) or behavioral changes (e.g., changing thermostat settings, using a shower timer, or turning off lights or fans when leaving a room) that have short or immediate payback periods. It should be noted that many low-income households already may be working hard to save energy, and additional savings may be scarce.
- Offer direct install programs for low-income households. The California Energy Commission acknowledges that direct install programs may be the most straightforward, if costly, method to enable energy efficiency retrofits for this sector (Scavo, et al., 2016).

8. Create regional one-stop shops to integrate energy efficiency retrofits with other sustainability, health and safety improvements.

Homeowners often have multiple concerns about their homes, and energy efficiency is likely not at the top of the list. In the focus groups, Latino participants more frequently described their homes as old, and talked about higher priority needs such as leaking roofs, leaking pipes and broken furnaces. Census data support the fact that Latino Californians are more likely to live in older homes than the general California population. Often, conditions found in older or lower quality homes have such serious health and safety implications (e.g., asbestos, lead and mold) that energy efficiency improvements cannot be made until these issues are addressed. Adding to the need to improve housing conditions is the state's urgent effort to move toward zero net energy[16] and climate-resilient buildings. Considering that home improvement projects require major efforts from households to complete – even when they are heavily subsidized – it would be most efficient and appealing to homeowners to address several of these needs at once along with energy efficiency, under the guidance of one program provider.

[15] Energy Upgrade California® Home Upgrade provides assistance and incentives for whole-house energy efficiency upgrades. The program is managed locally by IOUs and regional energy networks, with support from the CPUC in collaboration with the California Energy Commission. (SDG&E, n.d.)

[16] Achieving zero net energy means the total amount of energy used by the building on an annual basis is roughly equal to the amount of renewable energy created on the site.

Recommendations: Offer regional one-stop shops to provide a streamlined access point for Latino owners or residents of low-quality housing to access a collection of home improvement services.[17] The one-stop shops should coordinate and possibly partner with local providers of energy- and non-energy services, such as energy efficiency direct install programs; solar, storage and demand response programs; water efficiency resources; zero-emission transportation options; asbestos, lead and mold removal; basic structural maintenance; and climate resilient retrofits.

Research Recommendations

9. Evaluate program design and outreach recommendations.

This is an exploratory study and the recommendations have not been prioritized. To help policymakers, local governments, utilities, contractors, auditors and other program stakeholders better serve households as they pursue energy efficiency in their homes, more research is needed to systematically evaluate these recommendations. Furthermore, more data are needed to establish a baseline for measuring program participation among Latinos or other underrepresented groups. According to a 2016 study of 29 utility energy efficiency programs, only 55% of these programs collected data on race or ethnicity and only 21% collected data on primary language spoken (Frank and Nowak, 2016).

Recommendations: Policymakers and program implementers should devote resources to evaluate the recommendations made in these studies. This could either be coordinated statewide (e.g., through the California Energy Commission and/or the California Public Utilities Commission) or regionally. Lessons learned from these evaluations should be disseminated widely, so that others can build on these efforts to better serve Latino households.

Programs also should begin collecting race, ethnicity and language data through voluntary fields on program enrollment forms or through a voluntary program survey[18] – both of which should be available in English and Spanish. While asking for this information can be sensitive, partnerships with trusted CBOs can help ensure it is done in an effective manner. Programs can leverage question and answer wording from the American Community Survey to ensure high quality data and facilitate comparisons to data about the broader population. Language preferences should be determined during enrollment (or as early as possible) to facilitate effective program engagement; these data also can be used as a rough proxy for acculturation levels, which can provide further insights into Latino populations.

[17] This is also recommended by the California Energy Commission and others (Scavo, et al., 2016).

[18] An example of a program that collects demographic data through a voluntary survey is California's Clean Vehicle Rebate Project. The CVRP survey is administered via email to all program participants and achieves an approximate 20% response rate; the data are weighted to make it representative of program participants with respect to county, vehicle model and purchase vs. lease (Center for Sustainable Energy, 2016).

10. **Conduct research to understand the opportunities and limitations of housing stock and behavior patterns in different communities.**

A pre-requisite for achieving energy savings is understanding how energy is being *used* in a home, particularly at a level where conservation (through behavior changes) or efficiency gains (through improved equipment or building envelope) would make significant energy and non-energy impacts. This research project indicated that there may be less opportunity for savings related to HVAC systems in Latino households. For example, in interviews with contractors, several contractors mentioned that Latinos have lower energy use relative to other households as they often use evaporative cooling, fans or other alternatives to central air conditioning. The survey reinforced that finding: of respondents with central air conditioning, foreign-born Latinos were less likely than U.S.-born non-Latinos to use air conditioning (82% vs 91%).

The relative lack of air conditioning use could be related to cost sensitivity. One contractor, speaking of both Latinos and non-Latinos, noted, "If you were to look at the summer electricity bills of people in this area, it would be misleading. Many people cut way back for affordability. One taste of a $400 summer electricity bill, and a household may be very hesitant to use air conditioning, turning it on only when it is very hot."

Furthermore, a pre-requisite for investing in energy efficiency upgrades is the perception that high energy bills are problems to be solved. Accordingly, more research is needed to understand household perspectives among different segments within the broader Latino population on what they believe needs to be fixed, as well as understanding how households think on how they should be fixed (e.g., using personal/social networks to complete home improvement projects).

Recommendations: Conduct attitudinal and behavioral research across different geographies and household metrics such as language spoken at home, family country of origin, income, age and generations in home. Some of this research should be done in surveys and interviews, as well as other anthropological research methods in real homes. Hopefully, this research would then be used to help policymakers and program implementers to better quantify potential energy savings and to design more targeted and relevant programs based upon understanding the needs of distinct segments within the Latino population.

V. References

Arreola, G., Moezzi, M., and Parsons, L. (2017). *Field Research Findings: Home Energy Audits and Upgrades Among Hispanic in California's Central Valley.* Center for Sustainable Energy.

California Hub for Energy Efficiency Financing. (2017). About the CHEEF. Retrieved from https://www.thecheef.com/

Center for Sustainable Energy. (2013). *Energy Efficiency - Florey home case study.* Retrieved from https://energycenter.org/energy-efficiency-florey-home-case-study

Center for Sustainable Energy. (2016). *California Air Resources Board Clean Vehicle Rebate Project, EV Consumer Survey Dashboard*. Retrieved from http://cleanvehiclerebate.org/survey-dashboard/ev.

Center for Sustainable Energy. (2017). *Online Experiment Findings: Message Effects on Energy Efficiency Choices among Hispanic and Non-Hispanic Homeowners in California.*

Davis, L. E., & Engel, R. J. (2011). *Measuring Race and Ethnicity.* New York: Springer.

Evergreen Economics. (2013). *Needs Assessment for the Energy Savings Assistance and the California Alternate Rates for Energy Programs.*

Frank, M., & Nowak, S. (2016). *Who's Participating and Who's Not? The Unintended Consequences of Untargeted Programs.* Washington, DC: ACEEE. Retrieved from http://aceee.org/files/proceedings/2016/data/papers/2_542.pdf

Fuller, M. C., Kunkel, C., Zimring, M., Hoffman, I. M., Soroye, K. L., & Goldman, C. A. (2010). *Driving Demand for Home Energy Improvements.* Berkeley: Lawrence Berkeley National Laboratory, Environmental Energy Technologies Division.

Humes, K. R., Jones, N. A., & Ramirez, R. R. (2011). *Overview of Race and Hispanic Origin: 2010.* U.S. Census Bureau. Retrieved from https://www.census.gov/prod/cen2010/briefs/c2010br-02.pdf

Inova Energy Group. (2017). *Capturing Cultural Diversity An Energy Ethnography of Hispanic Households.*

Lee, C., Fernandez, N., and Martin, B. (2002). *Using self-referencing to explain the effectiveness of ethnic minority models in advertising.* International Journal of Advertising, 21, pp. 367-379.

Office of Efficiency and Renewable Energy. (n.d.). *Innovative Home Tours Homeowners Understand Energy Savings.* U.S. Department of Energy. Retrieved from https://energy.gov/eere/better-buildings-neighborhood-program/innovative-home-tours-help-homeowners-understand-energy

Reed, J. H., Oh, A., Talerico, T., Riggert, J., & Johnson, K. (2001). *Statewide Residential Customer Needs Assessment Report.* TecMRKT Works.

Research Into Action, Inc. & Center for Sustainable Energy. (2016). *Focus Group Findings: Exploring Home Improvement Projects and Energy Efficiency among Latinos and Non-Latinos in Fresno and San Diego.* Center for Sustainable Energy.

Research Into Action, Inc., Ghoulem Research, Dena Gromet. (2016). *Literature Review: Housing, Energy Use, Decision-Making and Messaging among Key Ethnic Groups in California.* Center for Sustainable Energy.

Scavo, Jordan, Korosec, S., Guerrero, E., Pennington, B., & Doughman, P. (2016). *Low-Income Barriers Study, Part A: Overcoming Barriers to Energy Efficiency and Renewables for Low-Income Customers and Small Business Contracting Opportunities in Disadvantaged Communities.* California Energy Commission. Publication Number: CEC-300-2016-009-CMF.

SDG&E. (n.d.) Energy Upgrade California Home Upgrade. Retrieved from https://www.sdge.com/save-money/energy-upgrade-california-home-upgrade

U.S. Department of Energy. (2012, March 1). Better Buildings Neighborhood Program Peer Exchange Call: Incorporating Do-It-Yourself Projects into Programs.

U.S. Department of Energy. (2017, June 29). Community-Based Social Marketing: Using Social Science & Data to Change Behavior. Retrieved from https://energy.gov/sites/prod/files/2017/07/f35/bbrn_Summary_Comm_Based_Social_Marketing_062917.pdf