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Ameren Illinois Company Transition Period

Low Income Needs Assessment

Final

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Opinion Dynamics

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1. Executive Summary

Ameren Illinois Company (AIC) serves a substantial low- and moderate-income population, accounting for approximately half of the customers in their service territory.[1] As such, AIC aims to improve the reach and efficacy of its income qualified (IQ) energy efficiency programming for this hard-to-reach market and has increased the annual budget for 2018 initiatives by approximately 50% over previous years. To help AIC achieve their goal of reaching more IQ customers, the evaluation team conducted a study that explored the unique needs of this community. The study assessed AIC customers' access to technology, awareness of energy efficiency, barriers to participation, and importantly, energy efficiency needs to aid in future program design, marketing, and customer targeting.

Study Goals and Methodology

Building on research conducted by the evaluation team in PY8 and PY9, as well as information gathered through AIC's 2016 Potential Study, the Low Income Needs Assessment aimed to provide detailed information about the characteristics of IQ customers in the AIC service territory. To meet this goal, we conducted a survey with low- and non-IQ customers that sought to answer the following research questions:

- What access do IQ customers have to information and technology? What are the informational and technological barriers to energy efficient action among IQ customers? What are IQ customers' trusted sources of information? What program outreach strategies would be most effective at reaching different IQ customer subgroups?
- How do the needs of IQ customers differ from market-rate program participants? How many IQ residences need major home repairs that might inhibit AIC from making energy efficiency upgrades in their homes?
- How do IQ customers think about their energy use compared to moderate or higher income customers? Do they attempt to manage their use on a day to day basis through home upgrades or behaviors? Do they feel it is something outside of their control or something they cannot afford?
- To what extent do AIC customers struggle to pay their energy bills?

The residential customer survey conducted for this study collected findings from over 1,500 AIC customers, 56% of which were income-qualified.

Summary of Key Findings and Conclusions

Overall, this study shows significant opportunity for AIC to serve non-IQ and IQ customers with energy efficiency programming. Findings suggest that IQ customers care about their energy use and attempt to save energy as

[1] Opinion Dynamics (2018) *Impact and Process Evaluation of the 2016 (PY9) Ameren Illinois Company Home Efficiency Income Qualified Program.* Opinion Dynamics Corporation.

much as possible, but still face barriers such as lower levels of internet access in the home, and being renters who live in their homes for shorter periods of time, which can affect their ability to make energy upgrades. We outline the key conclusions from this research in the sections below.

Marketing and Outreach

We found that just under half of IQ and non-IQ customers are aware of AIC's energy efficiency programming. Of the IQ respondents that were aware, 36% report participating in such programs, which is nearly twice as high as participation rates among non-IQ customers aware of the programs. To build on this foundation and reach greater numbers of customers, we recommend utilizing community outreach channels and specifically targeting places of worship, as this was the most trusted and engaged with community group across both of the study segments. AIC should also consider partnering with foodbanks and canvassing in low-income neighborhoods to reach communities in need.

Barriers to Participation and Technology Adoption

The study confirmed that demographic characteristics typical of many IQ communities also apply in the AIC territory, and may present barriers to program participation. These characteristics include IQ respondents being much more likely to live in rental housing and multifamily buildings, and IQ customers living in their homes for shorter periods of time than non-IQ customers.

There is also a technology divide between IQ and non-IQ customers, where IQ customers are less likely to have access to the internet at home (86% of non-IQ versus 69% of IQ respondents have internet at home). Income Qualified customers are also less likely to own or be familiar with smart phones (27% vs. 21%). This phenomenon has been seen in other areas of the country and presents a new challenge as utilities increase their deployment of connected devices in order to access new and deepen existing energy savings opportunities. For AIC IQ customers, this technology divide may affect awareness and participation in new and future programs, and their ability to utilize smart devices to their full capabilities.

Energy Efficiency Needs of AIC customers

Income Qualified customers face hardship when paying their bills and consider themselves to be doing all that they can to save energy and money. Given the level of concern that IQ customers have about their energy use, they consistently study their utility bills to determine ways to save energy. Further, a considerable fraction of IQ customers (45%) are "idealists"—those who care about saving energy but have not taken steps to do so. Collectively, these findings point to a clear need for ongoing AIC programming for this sector, as it suggests that Income Qualified customers want and need to save energy but might not know the best strategies. In addition to AIC's current efforts targeting single and multifamily IQ customers with direct install and whole house measures, the utility and its implementation partners should continue to explore the feasibility of offering information or financial assistance related to the installation of upgraded windows and doors, which customers identify as one of the most needed items both from an energy efficiency perspective and a general home repair perspective. Based on the findings from this study, AIC should also continue making programmable and smart thermostats available to customers, as a notable fraction of respondents in both study segments suggested adjusting their thermostats as a behavior-based way to save energy.

2. Study Methodology

Within this section, we outline the survey methodology deployed for this study.

AIC Residential Customer Survey

The evaluation team conducted a survey with AIC's residential customers using a mail-push-to-web (MPW) fielding approach, in which Opinion Dynamics printed and mailed invitations to customers to complete the survey. The survey invitations contained a web address, which the recipient could access to complete the survey, as well as a telephone number that they could call if they preferred to take the survey over the phone. We also provided a unique personal identification number (PIN) that the respondent entered online or provided to the interviewer to identify their associated sample record, which prevented people from completing the survey more than once and allowed us to track survey completion.

Given that IQ customers are less likely to complete surveys than other customers, we oversampled households that were likely to be IQ using the Census Low Response Score, which is correlated with income. The Census Low Response Score is the response rate to the Decennial US Census at the census tract level and is a good predictor of response to other surveys as well. By oversampling tracts with high nonresponse scores, we achieved roughly-equivalent responses from IQ and non-IQ populations (56% IQ, and 44% non-IQ), which ensured that we could make comparisons between responses from both groups of customers. The percentage of IQ respondents captured by the survey reflect estimates of the incidence of IQ customers in the AIC service territory, which range from 41%[2] to 50%, and as such, the responses to the survey should reflect the AIC population. Table 1 provides an overview of our sample and completed surveys by segment.

Table 1. Survey Completes by Segment

Segment	Completed Surveys
Income Qualified	881
Non-Income Qualified	680
Total	**1,561**

Survey Dispositions and Response Rate

We fielded the Residential Customer Survey from March 20 to April 13, 2018. A total of 1,561 customers completed the survey, with 1,298 completing the survey online and 263 by calling our phone center and completing the survey with a live interviewer. Table 2 provides the final survey dispositions.

Table 2. IQ Population Survey Dispositions

Disposition Code	Inputs[a]	Number of Customers
Complete - web	I	1,298
Complete - inbound phone	I	263

[2] AIC 2016 Potential Study. Forty-one percent is likely an underestimate of program eligibility because the Potential Study made use of an internet survey that would have excluded customers without internet access, who tend to be poorer and older.

Disposition Code	Inputs[a]	Number of Customers
Partial complete - survey eligibility confirmed	N	114
Partial complete - survey eligibility unknown	U1	16
Not available	U1	1
Non-specific callback	U1	2
Refused - email to client	U1	3
Hard refusal	U1	1
No response	U1	3,425
No answer	U2	1
Ineligible to participate	X1	80
Return to sender - mail	X2	269
Total		**5,473**

[a] Inputs are for AAPOR response and cooperation rates detailed in Appendix A.

Table 3 provides the response rate (RR) and cooperation rate (CR). Appendix A provides information on the methodology used to calculate RRs and CRs for web and telephone surveys.

Table 3. IQ Population Survey Response and Cooperation Rates

AAPOR Rate	Percentage
RR3	31%
CR3	92%

Survey Analysis

To assess whether the customers who completed our survey were different from those that did not, thus increasing the possibility of non-response bias, we compared the demographic characteristics of the survey respondents to the demographic characteristics of the population in AIC's service territory. Overall, survey respondents were similar to the population across a range of characteristics (i.e. the demographics varied from the service territory population by less than 5%). Still, we corrected for these differences and weighted responses based on income, education nested by home ownership, and householder age. The racial composition of the survey respondents matched the AIC service territory and thus did not need to be weighted. We applied individual weights to respondents before analyzing the data.

In most cases, we compared IQ to non-IQ respondents to draw comparisons between the two groups, their specific characteristics and energy efficiency needs. To classify respondents as low income versus non-IQ, we used income and household size eligibility requirements for participation in AIC income qualified program (Table 4), which qualifies incomes of up to 300% of federal poverty guidelines.

Table 4. AIC Income-Qualified Program Eligibility Requirements

	Family Size							
	1	2	3	4	5	6	7	8
Maximum Annual Household Income	$35,310	$47,790	$60,270	$72,750	$85,230	$97,710	$110,190	$122,670

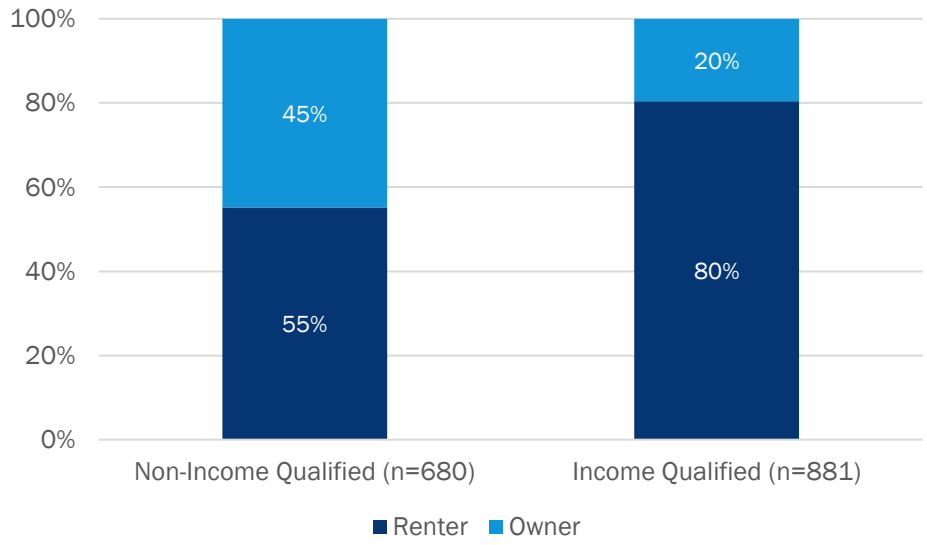
3. Detailed Findings

Within this section of the report, we present the most salient findings from the study organized around our research questions.

Income Qualified Customer Home Ownership and Occupancy Characteristics

There are a number of demographic characteristics that may have an influence on customers' ability to participate in AIC energy efficiency programs. For example, Figure 1**Error! Reference source not found.** shows that only 20% of IQ customers are homeowners, compared with 45% of non-IQ customers.

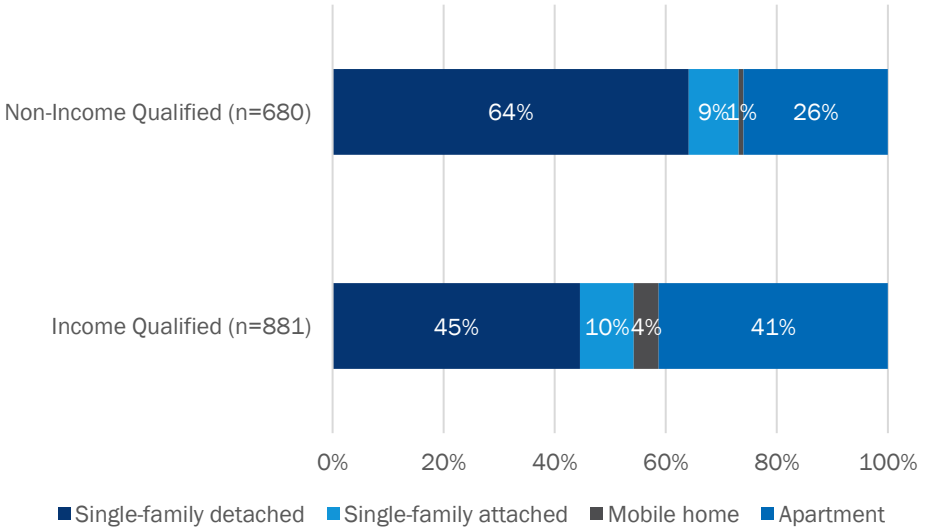
Figure 1. Homeownership by Segment



Survey Question: "Do you own or rent your home?"

Further, IQ respondents are less likely to live in single-family homes (Figure 2). This trend, as well as the fact that that over three quarters of IQ customers rent rather than own their homes, may present additional obstacles to taking energy saving actions given the need to obtain property manager participation or approval.

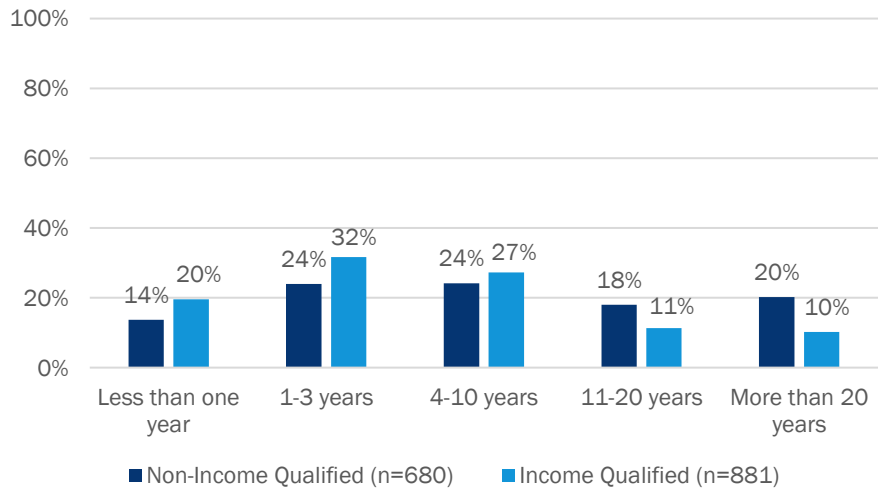
Figure 2. Home Type by Segment



Survey Question: "Which of the following best describes your home/residence?"

The home occupancy patterns of IQ customers also present a potential barrier to participation in energy efficiency programs. As shown in Figure 3, the IQ customer population is more transient than the non-IQ customer population. In particular, higher percentages of IQ customers have lived in their homes for less than four years when compared with non-IQ customers (56% IQ versus 38% non-IQ). Likewise, non-IQ customers are twice as likely to live in their homes for more than twenty years. Those customers residing in a home for shorter periods of time may be less likely to make energy saving investments in their home or work with their landlords to do so.

Figure 3. Length of Residency at Current Home by Segment



Survey Question: "How long have you lived in your current residence?"

Access to Information and Technology

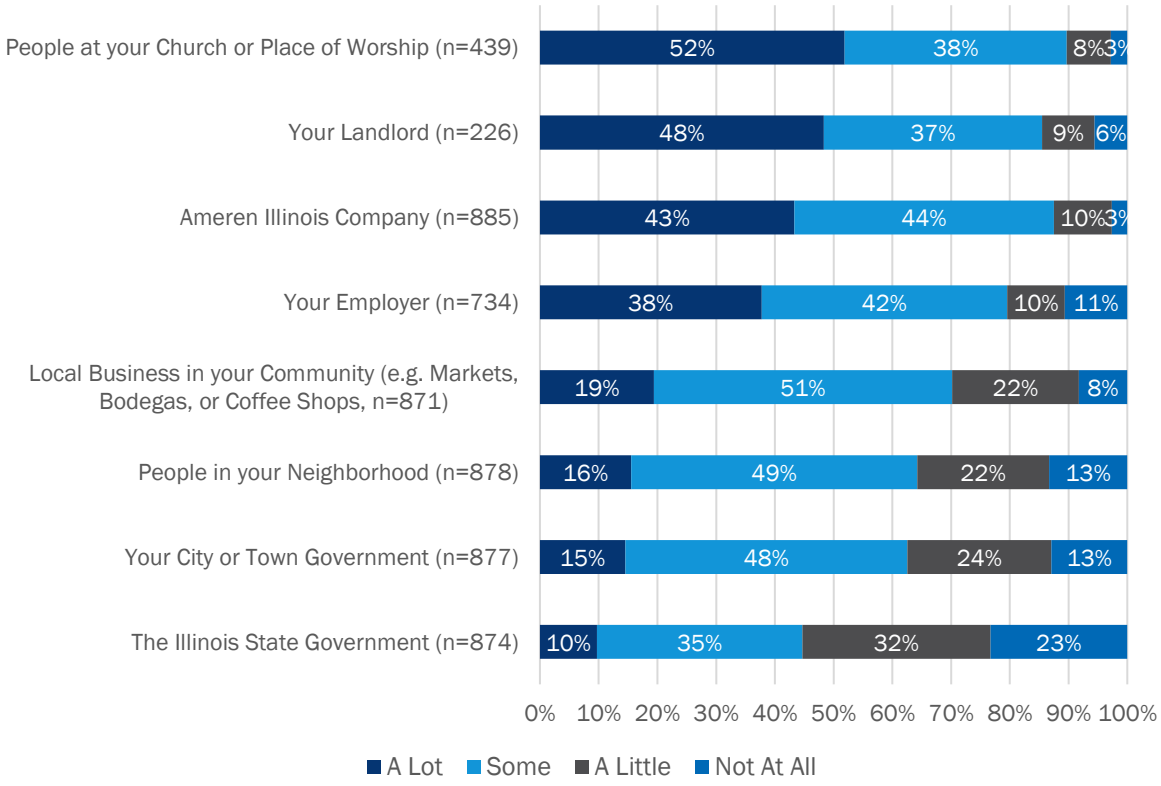
A central goal of this study was to provide AIC with information that will help them reach and serve income qualified customers. To reach this goal, we explored trusted information sources, engagement with community organizations, and access to technology—all of which affect how customers may learn of AIC programs.

Trusted Information Sources

In many parts of the country, energy efficiency program administrators have sought to leverage community organizations and the relationships they have with utility customers to provide information and encourage energy saving action. To help support AIC in developing effective outreach strategies, we sought to understand current trusted sources of information, the types of community groups AIC customers are active in, and the overall level of "connectedness" people feel to their communities, as a gauge on how effective this type of strategy might be in AIC territory.

The most trusted sources of information among both IQ and non-IQ customers were people from places of worship, landlords, and the utility (Figure 4). Given the findings that churches were the most frequently attended community organizations and that they also receive the highest levels of trust, this bolsters the findings that this is a viable channel to reach all AIC customers.

Figure 4. Level of Trust in Various Information Sources

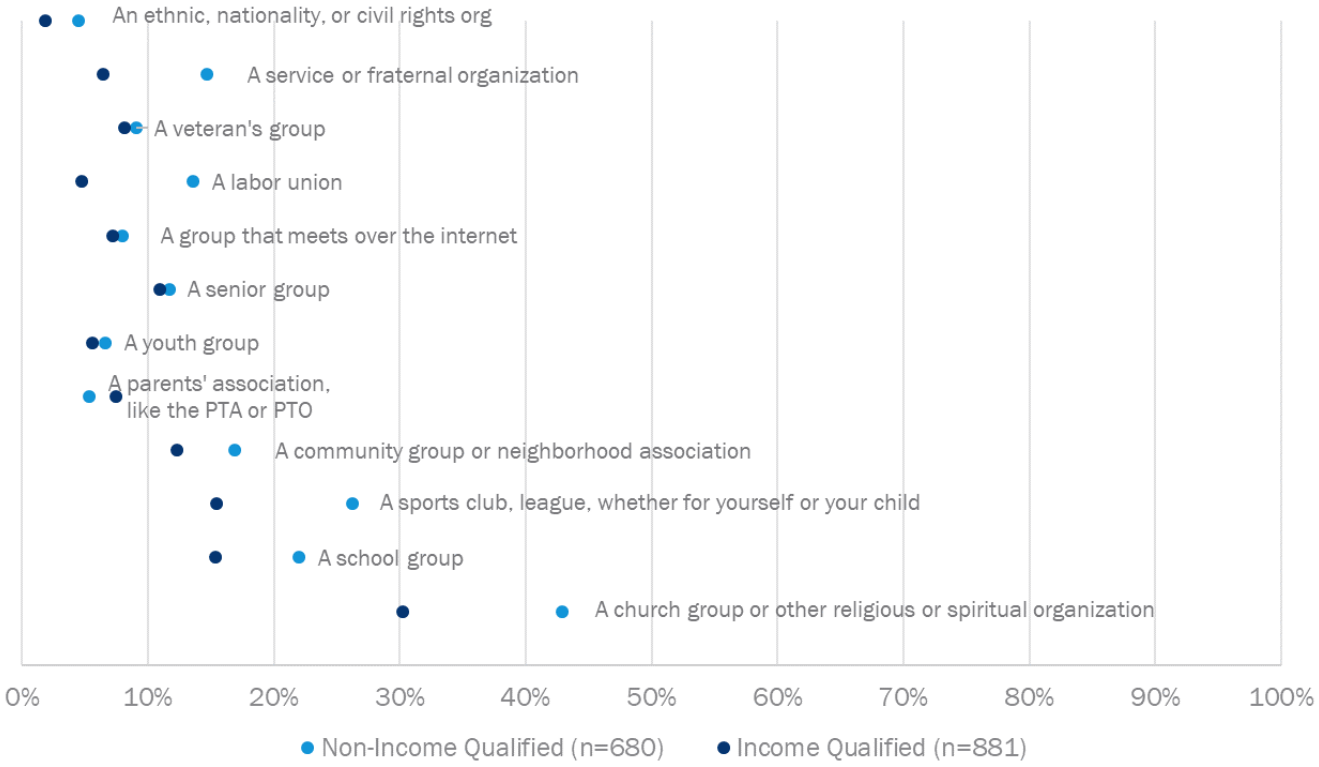


Survey Question: "Generally speaking, how much do you trust information coming from each of the following?"
Notes: Questions about landlords were only asked of renters (n=212 non-IQ, n=295 IQ); Questions about places of worship were only asked of those respondents that attend church or a place of worship (n=252 non-IQ, n= 289 IQ)

Engagement with Community Organizations and the Broader Community

Building on trusted sources of information, we examined which community groups respondents participated in to determine if any of these channels might be effective for outreach. As shown in Figure 5, non-IQ customers are generally more likely to be involved with a community group than IQ customers. However, both types of AIC customers report the greatest levels of involvement in church groups (43% for non-IQ and 30% for IQ), which aligns with our finding related to trust in these organizations as a source of information.

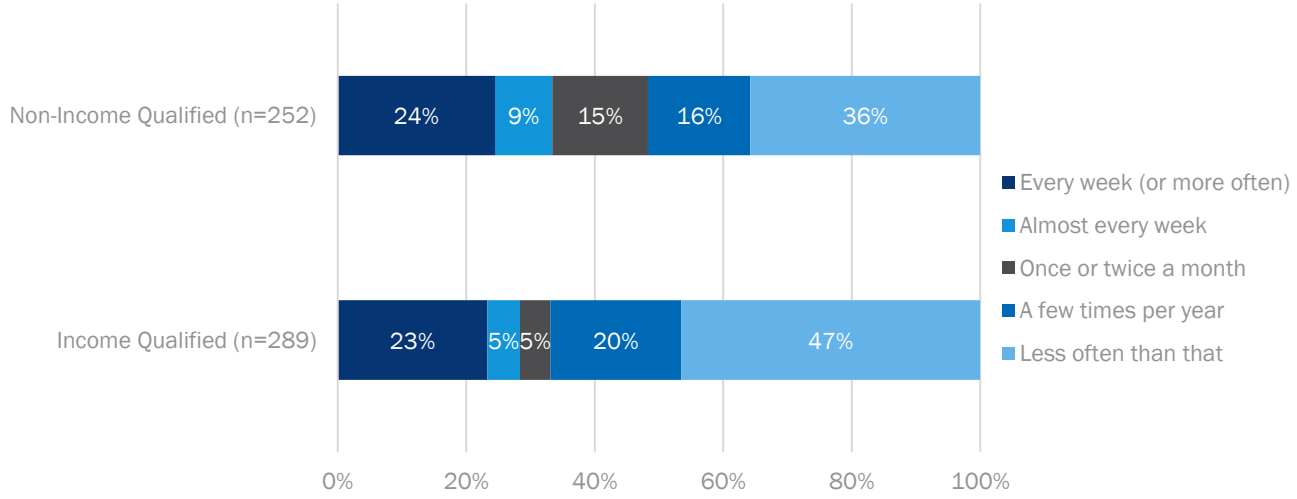
Figure 5. Involvement with Community Organizations



Survey Question: "In the past 12 months, have you been involved with any of the following groups?"

Further, as shown in Figure 6, 28% of IQ respondents attend church at least weekly and non-IQ customers attend at even higher rates, which suggests this could serve as a valuable channel for reaching AIC customers more broadly.

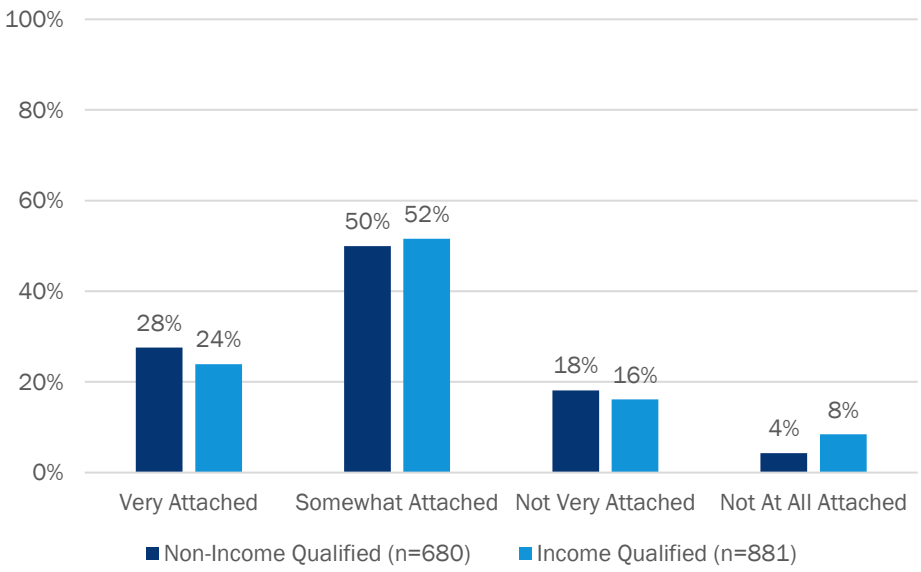
Figure 6. Frequency of Attending Religious Services



Survey Question: "Not including weddings and funerals, how often do you attend religious services?"

As an additional way to assess the potential for community-based outreach, we asked how attached people feel to their city or town. IQ and non-IQ respondents had very similar answers, with the majority of respondents falling into the "somewhat" or "very" attached categories (**Error! Reference source not found.**). This suggest that community-based outreach may resonate with AIC customers and bolster their participation in utility energy efficiency initiatives.

Figure 7. Community Connectedness by Segment

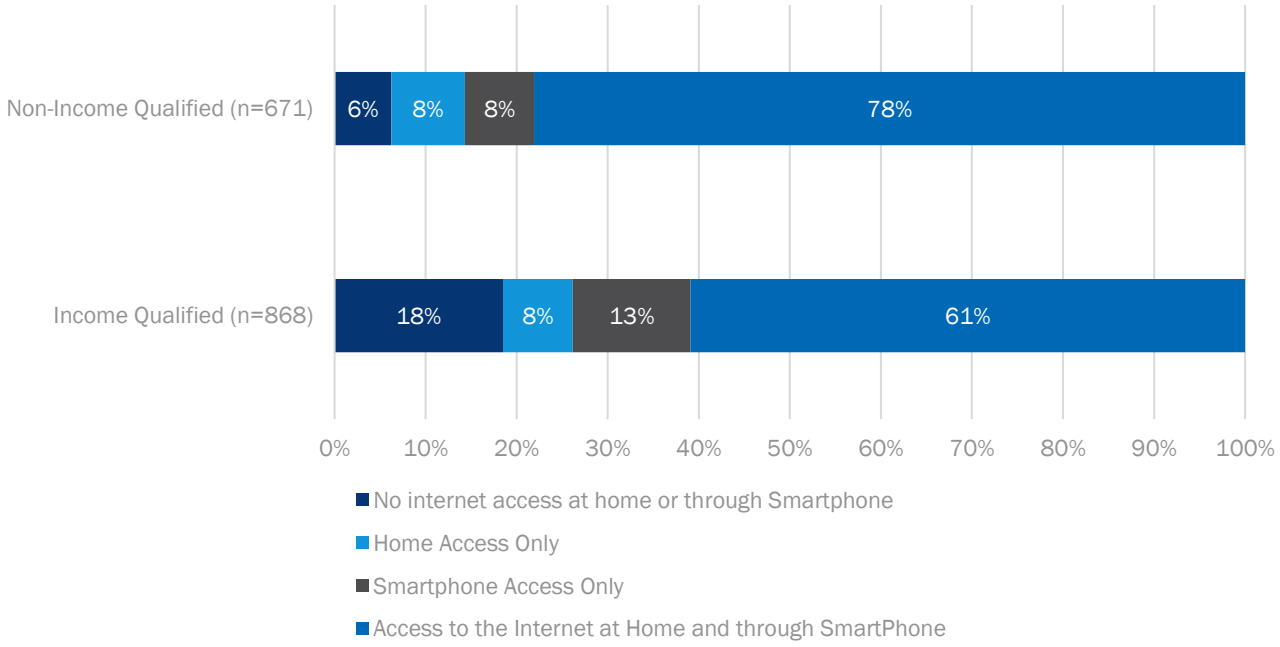


Survey Question: "In general, how attached do you feel to your city or town?"

Internet Connectivity in AIC Customer Homes

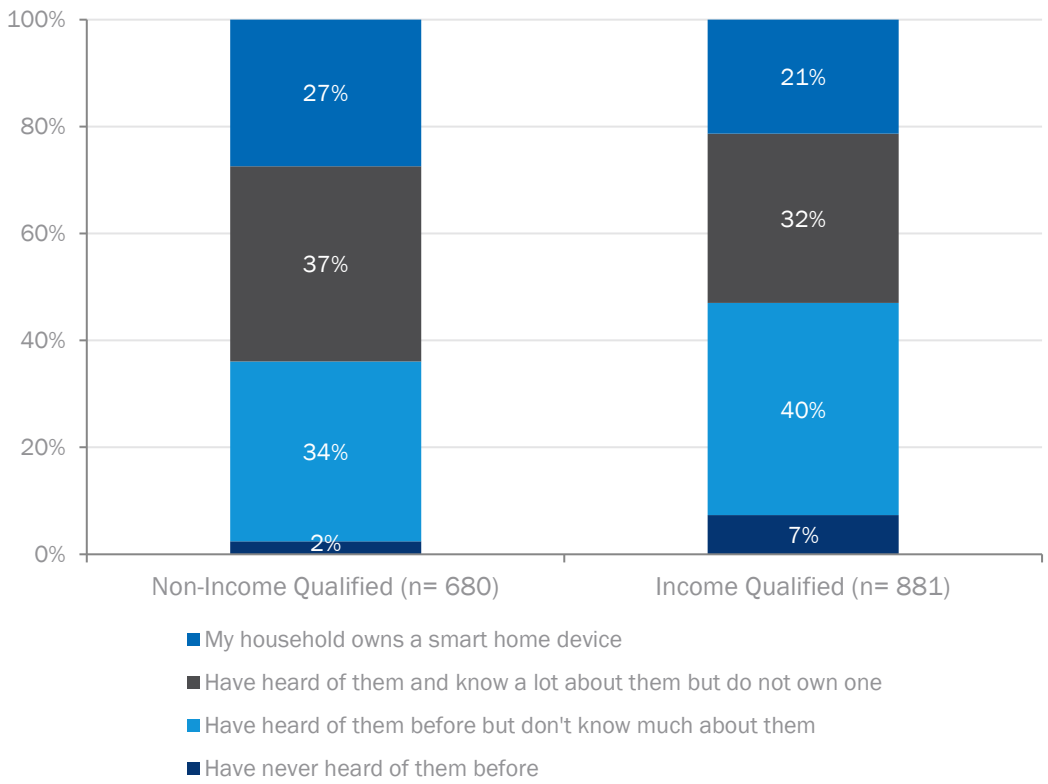
As more and more information becomes accessible online, and utilities communicate with their customers through this channel, it is important understand access to this information source and whether barriers to access exist. Within AIC's service territory, non-IQ respondents are significantly more likely to have access to the internet at home than IQ respondents (86% of non-IQ respondents compared to 69% of IQ respondents) (Figure 8). The technology divide between IQ and non-IQ respondents also existed for smart devices. IQ respondents are less likely to both own smart devices (27% vs. 21% IQ) and know a lot about them (37% vs. 32% IQ) compared to non-IQ respondents (Figure 9).

Figure 8. Access to Internet at Home



Survey Questions: "Do you ever use the internet or email at HOME?"; "Do you currently subscribe to internet service at HOME?"; "Do you subscribe to a dial-up internet service at home OR do you subscribe to a higher-speed broadband service such as DSL, cable, or fiber optic service?"; "Do you have a cellphone?"; "Some cell phones are called "smartphones" because of certain features they have. Is your cell phone a smartphone such as an iPhone, Android, Blackberry, or Windows phone?"

Figure 9. Familiarity with Smart Home Devices



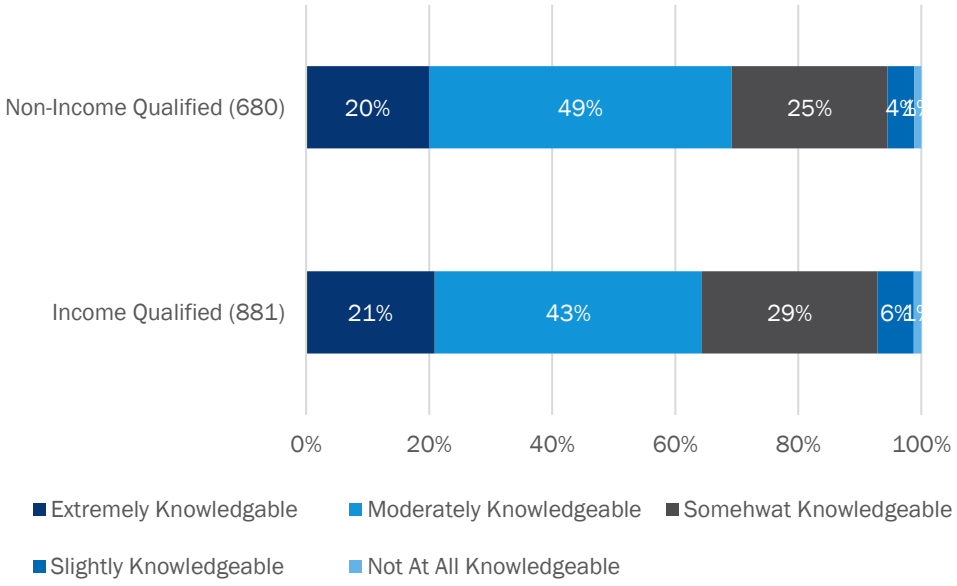
Survey Question: "How familiar are you with smart home devices? Smart home devices are electronic versions of household products (i.e. TVs, thermostats, sensors, cameras, light switches, speakers) that are usually connected to the internet and have advanced features including being able to be controlled or monitored remotely through a smartphone, tablet, computer (laptop or desktop), or voice assistant."

These findings have implications for three key aspects of energy efficiency programming: (1) IQ customers have less access to online information at home, which could reduce awareness and participation in programs, (2) lack of internet access may limit the deployment of smart devices (and subsequent energy savings) across the IQ community, and (3) future energy efficiency programs that leverage connected devices may not adequately serve IQ customers. Taken together, the findings suggest that IQ customers may not have equal access to EE innovations or opportunities to participate in cutting-edge programming, which has implications for how well AIC can serve this customer base in the evolving energy efficiency landscape.

Energy Management Mindset

Utility customers generally go through a variety of stages when they make a decision to change their behavior (Lavidge and Steiner, 1961; Vakratsas and Ambler, 1999; Hoang Sinh, 2013). The basic assumptions are that customers first become aware of an offering, then they develop attitudes and beliefs about the offering, and as a result are prompted to take action. As such, we asked respondents to rate their own awareness of ways to save energy in their home. As shown in Figure 10, both IQ and non-IQ respondents assessed their knowledge of ways to save energy as being relatively high, with more than half of both groups reporting that they were either extremely knowledgeable or moderately knowledgeable.

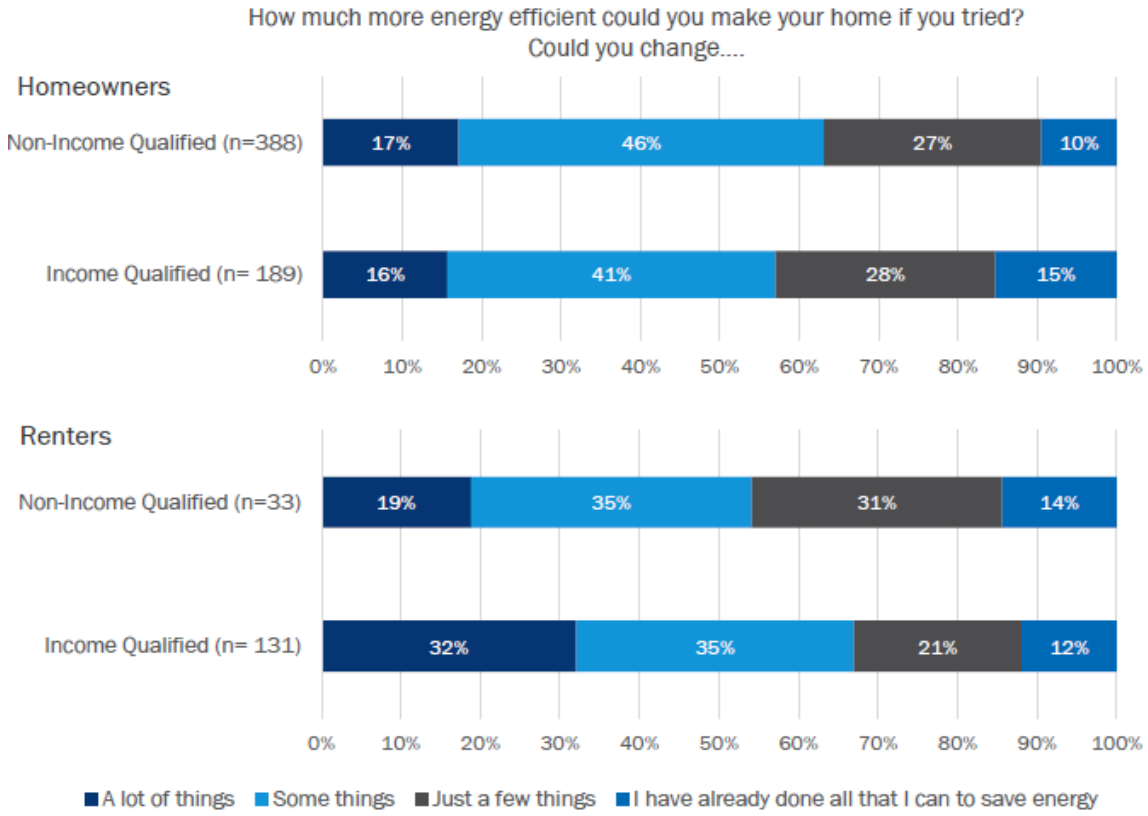
Figure 10. Level of Knowledge Regarding Saving Energy



Survey Question: How knowledgeable are you about how to save energy in your home?

Despite similar levels of self-reported knowledge about how to save energy in the home, however, there are some differences between IQ and non-IQ customers regarding how much they think could be done to make their homes more efficient. Notably, among renters, IQ customers are significantly more likely than non-IQ customers to believe there are a lot of things that could be done to make their homes more efficient (32% compared to 19%, respectively) (Figure 11).

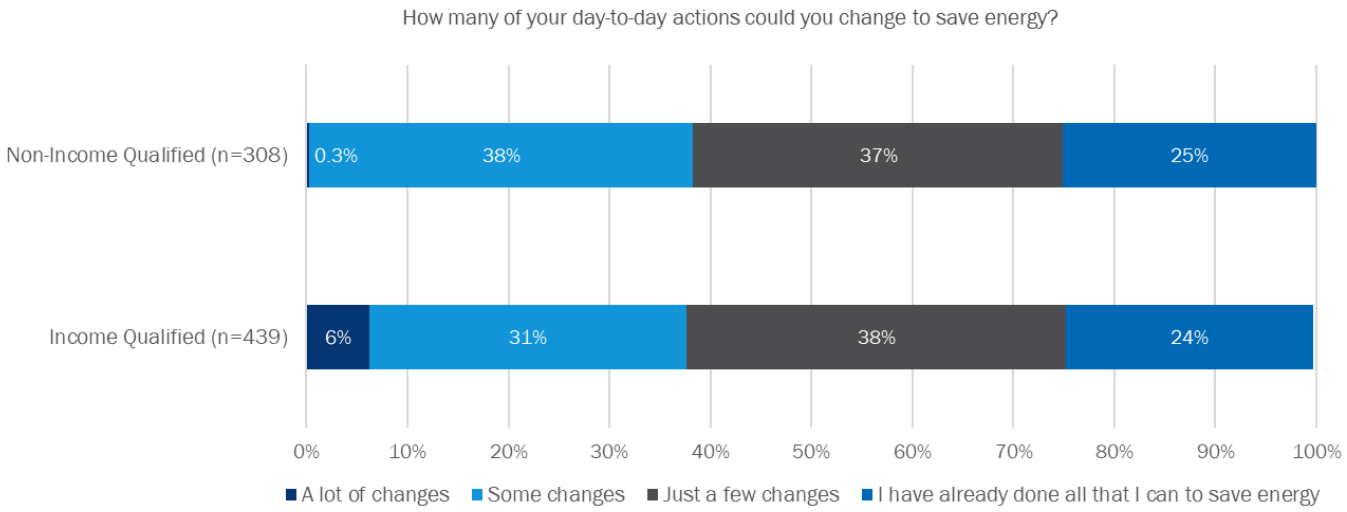
Figure 11. Potential for Energy Efficiency Upgrades



Note: This survey question was asked of only half of the respondents in order to limit respondent burden.
Survey Question: "How much more energy efficient could you make your home if you tried? Please consider physical upgrades you could make to your home's lighting, appliances, electronics, heating and cooling systems, and building shell items such as windows and insulation. Could you change..."

We also asked respondents about behavioral changes they could make to save energy and fewer respondents reported that they could change their behavior as compared to making physical upgrades to their homes. For example, over fifty percent of customers in both groups think there are only a few or no additional actions they could take to save energy in their home (Figure 12).

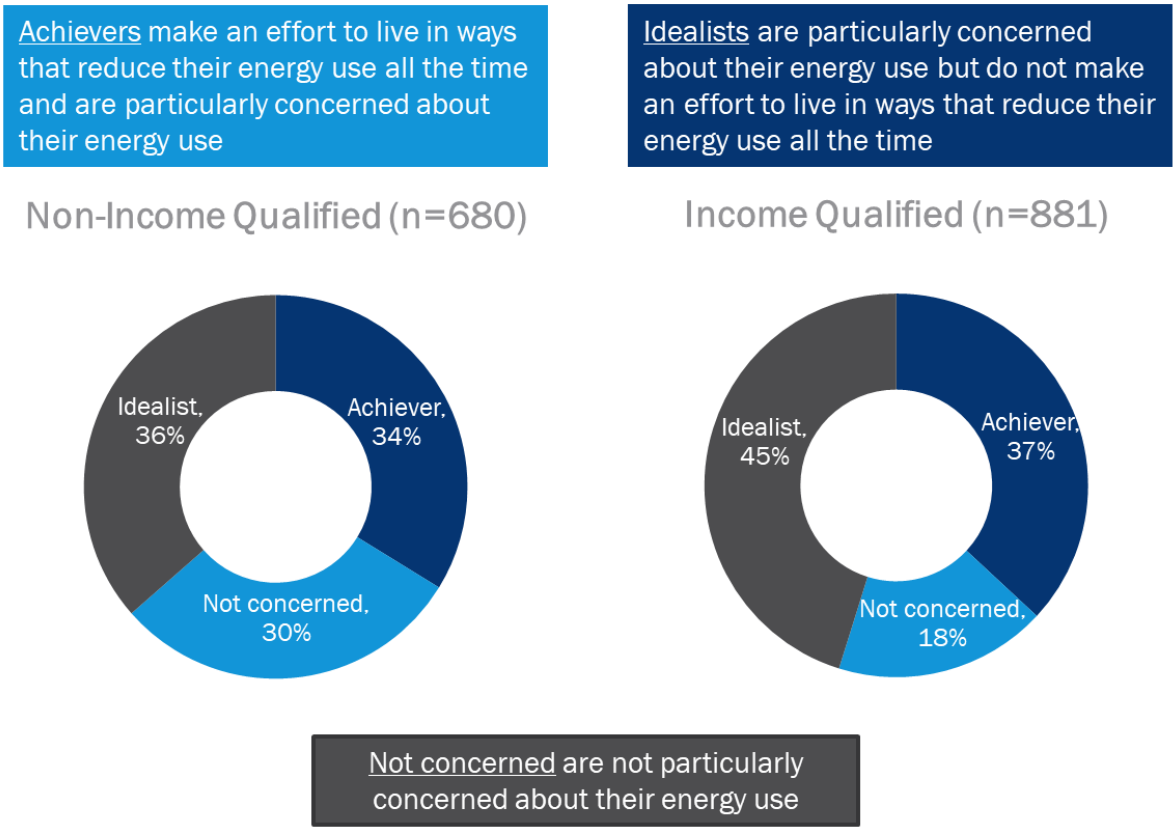
Figure 12. Potential for Customers to Save Energy Through Behavioral Changes



Note: This survey question was asked of only half of the respondents to limit respondent burden.
Survey Question: "How many of your day-to-day actions could you change to save energy if you tried? Please consider changes you could make to how you use your home's lighting, appliances, electronics, and heating and cooling systems."

As a third step in assessing the mindset of AIC customers related to energy use, we explored people's level of concern about managing their energy use, and how often they make an effort to live in ways to reduce their use. As shown in Figure 13, we found that similar percentages of IQ and non-IQ customers (37% versus 34% of non-IQ) are particularly concerned about their energy use and make an effort to live in ways that reduce energy use— what we term "achievers". However, more IQ customers than non-IQ customers are "idealists"—those who are concerned about their energy use, but do not make a day-to-day effort to reduce their energy use (45% versus 36% non-IQ).

Figure 13. Frequency of Energy Conservation Efforts by Segment



Survey Questions: "How often, if ever, do you make an effort to live in ways that reduce your energy use?"; "Would you describe yourself as particularly concerned or not particularly concerned about managing your energy use as you go about your daily life?"

Given that nearly half of the IQ customers fell into the idealist category, we wanted to understand more about this group and what might be holding them back from taking actions to save energy.

- Eighty-two percent of idealists are renters, which can be a barrier to action if the landlord is responsible for making energy efficient upgrades.
- Twelve percent of the homeowning idealists and 15% of the renting idealists noted that there were no physical upgrades they could make to their homes to reduce their energy use
- Sixteen percent of idealists said there were no behavioral changes they could make to save energy

According to the above data, a sizable percentage of idealists can make physical upgrades or behavioral changes to save energy, suggesting that a lack of need for energy efficiency is not what is preventing these customers from making changes. However, the fact that 82% of the idealists are renters may present a barrier to moving customers from the idealist to the achiever category, at least in terms of physical upgrades.

Another important finding related to the above model is the difference in IQ versus non-IQ customer concern about their energy use. In particular, a much larger fraction of non-IQ respondents reported that they are not

concerned about their energy use (30% non-IQ versus only 18% IQ). This finding is intuitive, as IQ respondents may have more pressure to save energy, and subsequently, money, on their energy bills. Still, this finding illuminates an opportunity for AIC to improve all customers' awareness and concern around saving energy, and effectively move them from "not being concerned" to "concerned," and perhaps, ultimately, to acting to save energy.

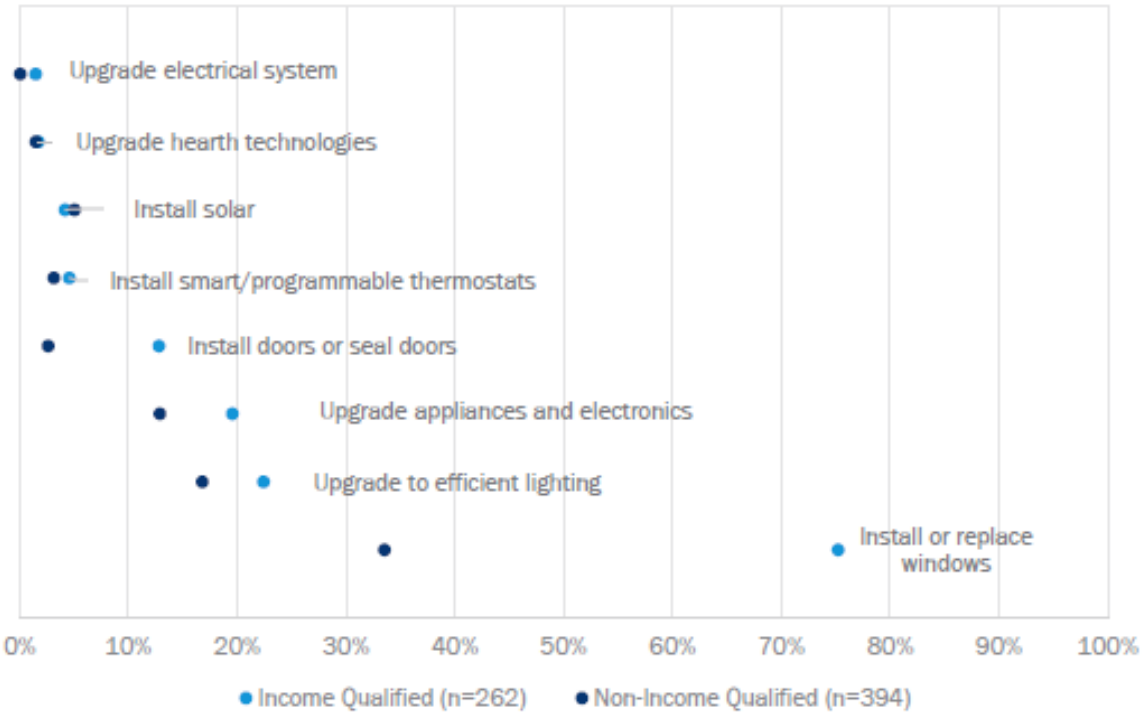
Findings regarding how often respondents check their energy bills also support findings around the customer mindset. Though IQ and non-IQ respondents check their utility bills at similar rates (60% of IQ and 57% of non-IQ respondents check their bills at least monthly), far more IQ respondents (46%) reported that their energy bill motivates them to use less energy "all the time", whereas only 29% of non-IQ respondents are motivated all the time in this way.

Home Upgrade Needs and Ability to Take Action

The study aimed to uncover which energy efficiency upgrades respondents could make using an unprompted approach. This strategy reveals which upgrades are important to AIC customers, but also gives insight to their knowledge of potential energy efficiency upgrades.

Overall, respondents most frequently suggested installing or replacing windows, upgrading lighting, and upgrading appliances and electronics (Figure 14) when asked what upgrades they could make to their home to make it more efficient. However, the greatest differences between IQ and non-low incomes customers can be seen related to improving the building envelope. In particular, IQ customers are significantly more likely to report that they could install or replace windows and install or seal doors as changes they could make to make their home more efficient.

Figure 14. Potential Energy Efficiency Upgrades Identified by Respondents

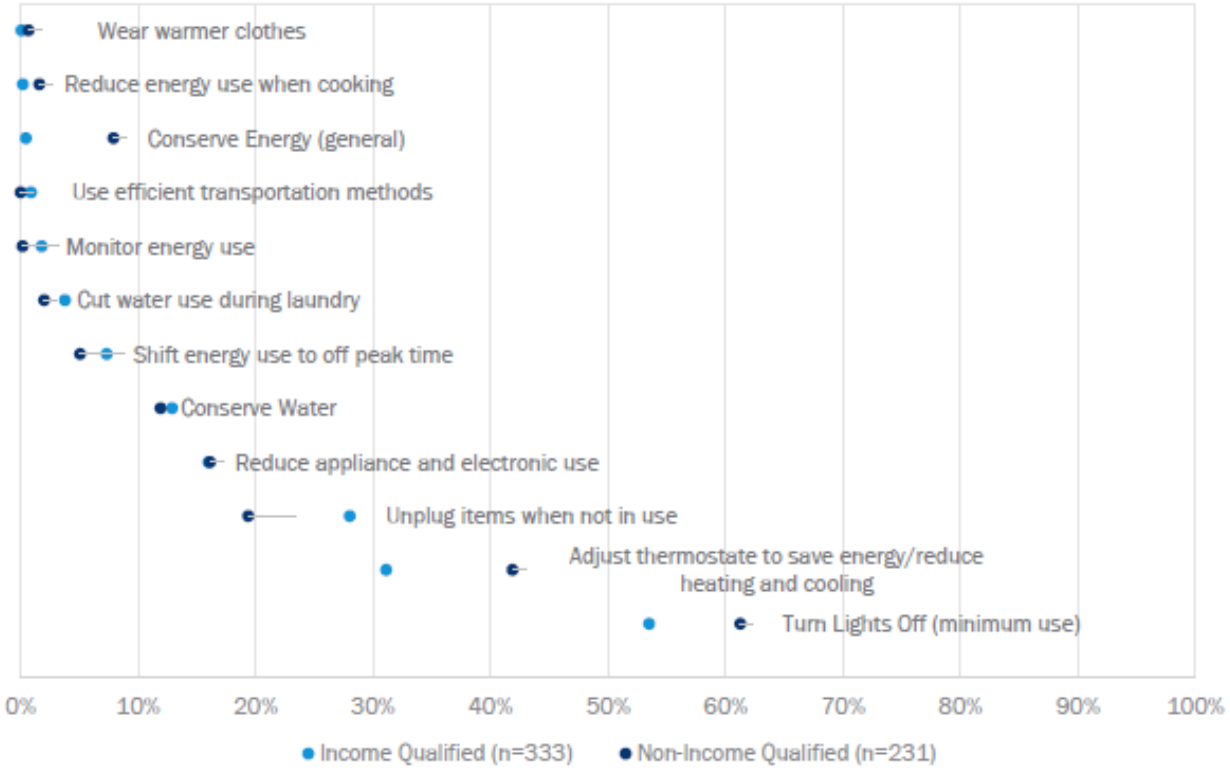


Survey Question: "What changes could you make to your home to make it more efficient? [OPEN END]"

We utilized the same approach for uncovering which behavioral changes respondents thought they could make. The most common behavior changes that customers felt they could make were turning off lights and adjusting the thermostat, and non-IQ and IQ respondents generally identified potential behavioral changes at the same rate (Figure 15). One notable difference is that significantly more non-IQ customers than IQ customers feel they could adjust their thermostat to save energy (42% vs. 31%). This finding, and the fact that approximately one third of AIC customers said they could adjust their thermostat settings, points to an opportunity for AIC to assist customers in achieving this goal by providing programmable and/or smart thermostats.

In addition to uncovering physical and behavioral changes that respondents were aware of, we also wanted to know the fraction of respondents that could not identify ways to save energy, as this may indicate a lack of awareness around energy efficiency. Twelve percent of IQ respondents and 9% of non-IQ respondents did not know of any ways they could save energy. For both groups, the percentages were low enough to suggest that, overall, AIC customers are aware of ways that they can save energy.

Figure 15. Potential Energy Efficient Behaviors Identified by Respondents



Survey Question: "What changes could you make to your day-to-day actions to save energy? [OPEN END]"

In addition to awareness and knowledge of what could be done to a home to save energy, a common barrier to energy efficiency program participation for IQ customers is often the poor condition of the housing stock. For instance, if homes do not meet safety standards, customers may be ineligible to participate. As such, we examined the need for general home repairs between IQ and non-IQ respondents. Overall, IQ and non-IQ respondents reported very similar rates of needing home repairs (Table 5). Consistent with survey questions around changes customers could make to their homes, the most commonly-cited home repair related to windows, with nearly half of both study groups indicating that they needed this work.

Table 5. General Home Repairs Needed by Respondents (Multiple Response)

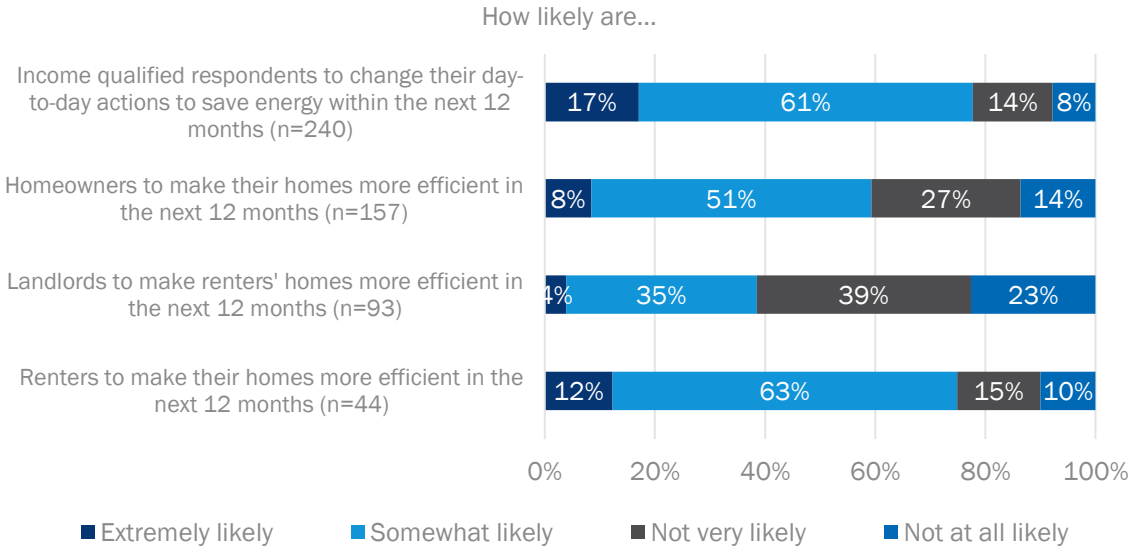
	Income Qualified (n=594)	Non-Income Qualified (n=434)
Window repairs	47%	45%
Appliance repairs for things like ovens, refrigerators, washers, and dryers	20%	19%
Roof replacement or repair	18%	15%
Plumbing repairs other than replacing fixtures or fixing clogs	16%	10%

Water damage repair	14%	12%
Foundation replacement or repair	13%	9%
Mold treatment	12%	6%
Electrical wiring repairs	10%	11%
Repairs to heating systems like boilers, electric heaters, and woodstoves	10%	11%
Repairs to cooling systems	9%	6%
Sewer line repair	2%	1%

Survey Question: "Which repairs does your home currently need?"

In addition to uncovering which upgrades customers need, the study aimed to understand how likely respondents were to make these physical or behavioral changes. In general, the likelihood of making upgrades and behavior changes was similar between IQ and non-IQ respondents, and as such, we present data for only the IQ population here. As shown in Figure 16, for homeowners, the majority reported that they were extremely or somewhat likely to make upgrades to their homes in the next twelve months. Given that renters may not have the authority to make energy efficient upgrades, we asked about both their own likelihood to make changes and their landlord's likelihood. Seventy-five percent of renters thought it was extremely likely or somewhat likely for them to make changes in the next twelve months. However, renters who indicated that their landlords would have to make any property upgrades were less optimistic about those changes happening, with only 39% anticipating that the changes were at least somewhat likely to happen in the next 12 months. In terms of behavior changes, 88% of IQ respondents indicated that making changes to their day-to-day actions was at least somewhat likely in the next twelve months.

Figure 16. Income Qualified Customers' Likelihood of Making Energy Efficient Changes to Home or Actions



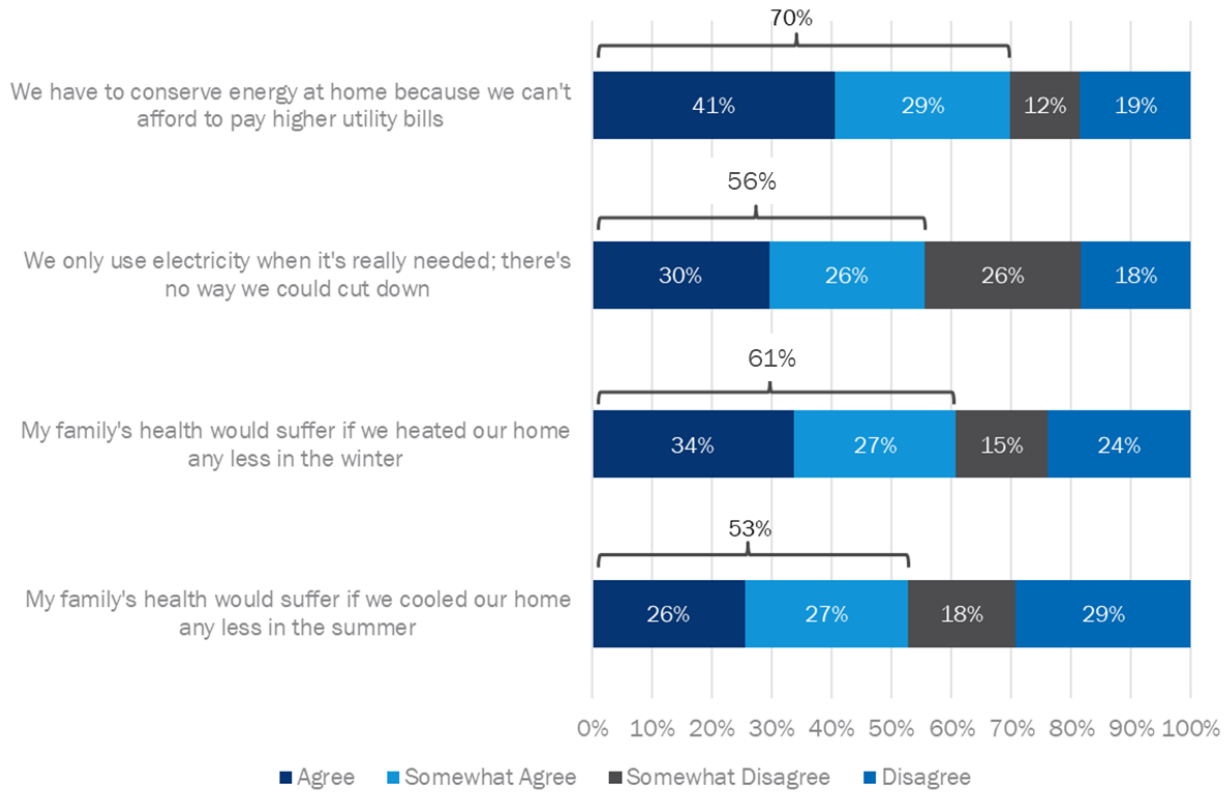
Survey Questions: "How likely is your landlord to make your home more efficient in the next 12 months?"; "How likely are you to make your home more efficient in the next 12 months?"; "How likely are you to make changes to your home to make it more efficient in the next 12 months?"; "How likely are you to attempt to change your day-to-day actions to save energy in the next 12 months?"

Energy Insecurity

For the purpose of this study, we define behavioral energy insecurity as a household's inability to pay their energy bills and their subsequent coping strategies. The study aimed to understand the degree to which income qualified customers experience energy insecurity, if at all. Thirty-eight percent of IQ and 16% of non-IQ respondents have experienced a time when they could not pay their bills or cover basic expenses in the past three years. Of those that have experienced this hardship, 80% of non-IQ respondents and 77% of IQ respondents had experienced it at least a few times (n=306).

In addition to facing challenges paying energy bills and covering basic expenses, the majority of IQ respondents agreed with statements that they are already conserving energy as much as possible, they have to conserve because they can't afford to pay for more electricity, and their family's health would suffer if they heated less in the winter or cooled less in the summer (Figure 17). Significantly fewer non-IQ customers agreed with these statements, pointing to a distinct difference in energy security between the two customer segments.

Figure 17. Indicators of Energy Insecurity Among Income Qualified Customers (n=881)

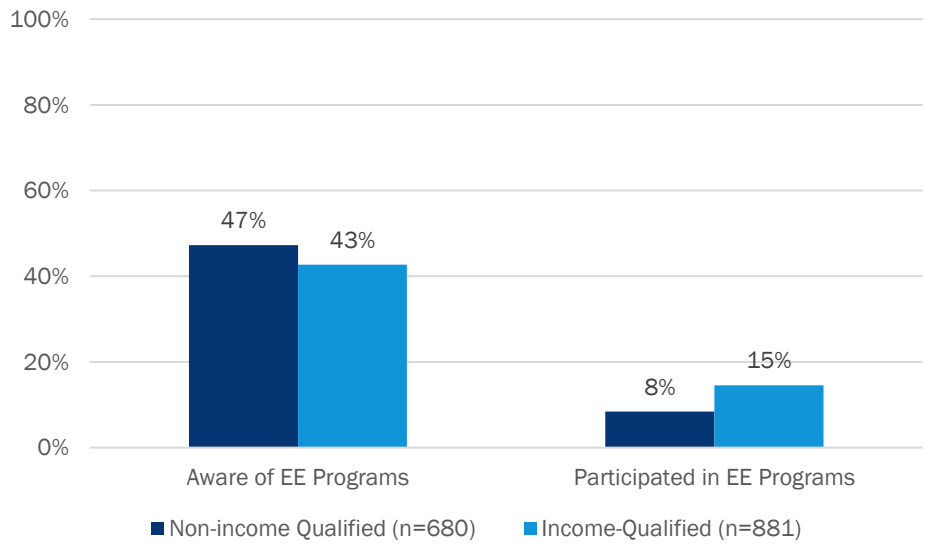


Survey Question: "For each of the statements about your household…please indicate whether you agree, somewhat agree, somewhat disagree, or disagree."

These findings illustrate the ongoing need for AIC support of IQ customers through a variety of channels, including energy efficiency. As such, we explored levels of awareness of utility-run energy efficiency programs

and rates of program participation between IQ and non-IQ respondents. Since customers must first become aware of energy efficiency program offerings in order to participate, we asked respondents whether they had heard of AIC energy efficiency programs that offer customers free or rebated upgrades on lighting, insulation, and heating or cooling equipment. Figure 18 shows that levels of awareness about AIC energy efficiency programs were similar among non-IQ respondents (47%) compared to IQ respondents (43%). Participation in programming was higher among income-qualified respondents, with 15% of income-qualified versus only 8% of non-income qualified respondents having participated in programs.

Figure 18. Program Participation and Awareness Among All Respondents



Survey Questions: "Before today were you aware of these programs?"; "Have you participated in one of these programs?"

4. Conclusions

Overall, this study shows significant opportunity for AIC to serve non-IQ and IQ customers with energy efficiency programming. Findings suggest that IQ customers care about their energy use and attempt to save energy as much as possible, but still face barriers such as lower levels of internet access in the home, and being renters who live in their homes for shorter periods of time, which can affect their ability to make energy upgrades. We outline the key conclusions from this research in the sections below.

Marketing and Outreach

We found that just under half of IQ and non-IQ customers are aware of AIC's energy efficiency programming. Of the IQ respondents that were aware, 36% report participating in such programs, which is nearly twice as high as participation rates among non-IQ customers aware of the programs. To build on this foundation and reach greater numbers of customers, we recommend utilizing community outreach channels and specifically targeting places of worship, as this was the most trusted and engaged with community group across both of the study segments. AIC should also consider partnering with foodbanks and canvassing in low-income neighborhoods to reach communities in need.

Barriers to Participation and Technology Adoption

The study confirmed that demographic characteristics typical of many IQ communities also apply in the AIC territory, and may present barriers to program participation. These characteristics include IQ respondents being much more likely to live in rental housing and multifamily buildings, and live in their homes for shorter periods of time than non-IQ customers.

There is also a technology divide between IQ and non-IQ customers, where IQ customers are less likely to have access to the internet at home, and are less likely to own or be familiar with smart phones. This phenomenon has been seen in other areas of the country and presents a new challenge as utilities increase their deployment of connected devices to access new and deepen existing energy savings opportunities. For AIC IQ customers, this technology divide may affect awareness and participation in new and future programs, and their ability to utilize smart devices to their full capabilities.

Energy Efficiency Needs of AIC customers

Income Qualified customers face hardship when paying their bills and consider themselves to be doing all that they can to save energy and money. Given the level of concern that IQ customers have about their energy use, they consistently study their utility bills to determine ways to save energy. Further, a considerable fraction of IQ customers (45%) are "idealists"—those who care about saving energy, but have not taken steps to do so. Collectively, these findings point to a clear need for ongoing AIC programming for this sector. In addition to AIC's current efforts targeting single and multifamily IQ customers with direct install and whole house measures, the utility and its implementation partners should continue to explore the feasibility of offering information or financial assistance related to the installation of upgraded windows and doors, which customers identify as one of the most needed items both from an energy efficiency perspective and a general home repair perspective. Based on the findings from this study, AIC should also continue making programmable and smart thermostats available to customers, as a notable fraction of respondents in both study segments suggested adjusting their thermostats as a behavior-based way to save energy.

Appendix A. Survey Response Rate Methodology

The survey response rate (RR3) is the number of completed interviews divided by the total number of potentially eligible respondents. We calculated RR3 using the standards and formulas set forth by the AAPOR.[3] The formulas used to calculate RR3 are presented below. The definitions of the letters used in the formulas are shown in Table 1.

Equation 1. Formula for RR3

$$RR3 = \frac{I}{\left(I + N + e1(U1 + e2 * U2)\right)}$$

Where:

$$e1 = \frac{(I + N)}{(I + N + X1)}$$

$$e2 = \frac{(I + N + X1 + U1)}{(I + N + X1 + U1 + X2)}$$

We also calculated a cooperation rate, which is the number of completed interviews divided by the total number of eligible sample units. We used AAPOR Cooperation Rate 3 (COOP3) for the web survey conducted for this study, which is calculated as:

Equation 2. AAPOR Cooperation Rate 3

$$COOP3 = \frac{I}{((I + P) + R)}$$

[3] Standard Definitions: Final Dispositions of Case Codes and Outcome Rates for Surveys, AAPOR, 2011. http://www.aapor.org/AM/Template.cfm?Section=Standard_Definitions2&Template=/CM/ContentDisplay.cfm&ContentID=3156.

Appendix B. Respondent Demographics

In addition to the demographics presented in the body of the report, which may have a direct effect on participants' ability to participate in EE programs, we present broader demographic characterizations of the IQ and non-IQ communities in the following appendix. This data is unweighted to reflect the survey respondent pool.

Table 6. Unweighted Demographics by Segment

Demographic	Percent Non-Income Qualified	Percent Income-Qualified	Percent Overall
Education (n=1561)			
Less than a high school degree	1%	6%	3%
High school degree	15%	35%	26%
Technical/trade school program	7%	7%	7%
Associates degree or some college	26%	27%	26%
Bachelor's degree	30%	17%	23%
Graduate/professional degree (J.D., MBA, MD, Ph.D.)	22%	8%	15%
Total	**100%**	**100%**	**100%**
Employment (n=1561)			
Employed full-time	63%	37%	49%
Employed part-time	5%	11%	8%
Retired	29%	40%	35%
Not employed but actively look	1%	4%	3%
Not employed and not looking	2%	8%	5%
Total	**100%**	**100%**	**100%**
Race (n=1561)			
White or Caucasian	91%	81%	86%
Black or African American	4%	9%	7%
American Indian or Alaskan	1%	0%	0%
Asian or Pacific Islander	2%	3%	3%
Hispanic, Latino, or Spanish	2%	3%	3%
Two or more races	1%	1%	1%
Refused to answer	0%	1%	1%
Other	0%	1%	1%
Total	**100%**	**100%**	**100%**

Age (n=1561)			
under 25	1%	4%	3%
25-64	69%	61%	65%
65+	29%	35%	32%
Total	**100%**	**100%**	**100%**
Annual household income (n=1417)			
<20k	0%	34%	16%
20-29k	0%	28%	14%
30-39k	7%	13%	10%
40-49k	5%	11%	8%
50-59k	11%	7%	9%
60-74k	18%	6%	12%
75-99k	20%	1%	11%
100-149k	25%	0%	13%
150-199k	7%	0%	4%
200k+	6%	0%	3%
Total	**100%**	**100%**	**100%**

Table 7. Unweighted Household Characteristics by Segment

Demographic	Percent Non-Income Qualified	Percent Income-Qualified	Percent Overall
House type (n=1561)			
Single-family detached	87%	68%	77%
Single family attached	5%	8%	7%
Mobile home	1%	7%	4%
Apartment/condo	7%	18%	12%
Total	**100%**	**100%**	**100%**
Number of units in building (multifamily only, n=187)			
1	6%	4%	4%
2-3	17%	16%	16%
4-9	36%	40%	39%
10 or more	40%	41%	41%
Total	**100%**	**100%**	**100%**
Length of residency at current home (n=1561)			
Less than 1 year	5%	11%	8%
1-3 years	16%	21%	19%
4-10 years	24%	23%	24%
11-20 years	23%	20%	21%
More than 20 years	32%	25%	28%
Total	**100%**	**100%**	**100%**
Year home was built (n=1338)			
Before 1950	22%	27%	24%
1950-1959	12%	15%	14%
1960-1969	10%	11%	10%
1970-1979	17%	18%	17%
1980-1989	8%	7%	7%
1990-1999	11%	10%	11%
2000-2005	7%	6%	7%
2006-2009	6%	3%	5%
2010 or Later	6%	3%	5%
Total	**100%**	**100%**	**100%**

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