PAYS Feasibility Study

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Prepared for:

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Executive Summary

This study assessed whether the Pay As You Save (PAYS) program model could contribute to increased energy efficiency uptake among KCP&L residential customers, and whether offering the program would be a administratively feasible for KCP&L. More broadly, the study examined whether any on-bill financing program would be a beneficial addition to KCP&L's residential energy efficiency portfolio, and the major implementation barriers KCP&L might face if it were to pursue offering such a program.

Objectives

This study focuses on two priority areas to assess PAYS feasibility in KCP&L territory:

1. Gap and Needs Analysis: An assessment of financing gaps for energy efficiency among customers in KCP&L's service territory; and whether PAYS or another on-bill financing program offers the best approach to address unmet financing needs.
2. Program Requirements and Obstacles: An analysis of the process and requirements to launch and administer a PAYS program, including typical stakeholders, key roles and responsibilities, major obstacles and potential solutions, and itemized costs.

Key Findings

The study included several research tasks, including a survey of KCP&L residential customers, a review of financing products currently available in the market along with two potential utility offered products (PAYS and on-bill finance), interviews with KCP&L staff, and other secondary research. Each of these lines of research provided important results that informed Cadmus conclusions and recommendations regarding PAYS feasibility. This section summarized key findings from the research.

Market Demand

Homeowners frequently use financing, and in some cases depend on it, to overcome high first cost barriers to home improvement projects, including energy efficiency upgrades. A third of homeowners (33%) reported using some kind of long-term financing to fund a home improvement purchase; of those, 61% said they could not have paid in cash. Homeowners using financing were more likely than those using cash to report not having financing would have caused them to delay, downgrade, or not complete their project.

Renters demonstrated even greater dependence on alternatives to paying cash: six of eight renters relied on someone else to pay for their projects, borrowed money from an acquaintance, or used financing. All of these respondents said they would have delayed, downgraded, or failed to complete their project if the payment method they used was not available. Supporting this finding, renters indicated especially high levels of concern related to payment and financing barriers, if they were faced with a sudden $5,000 expense. Over 50% of renter respondents rated seven of eight financing-related concerns to be significant or very significant.

Financing Gap Analysis

The study found that most customers' financing needs were already being met to at least some degree by standard products in the traditional financing sector, including credit cards, unsecured loans, secured products (i.e., home equity lines of credit) and others. None of these products excels at meeting all customers' needs (related to eligibility, cost, and convenience) but each excels in at least one area, and in that way the traditional financing sector meets the needs of different customer segments. However, the analysis found that none of the existing financing products analyzed, including PACE, were optimal for credit-stressed borrowers or renters. This finding is similar to Cadmus' findings in similar studies in other territories in Missouri.

Customer Response to PAYS

The customer survey presented a series of scenarios to respondents to assess their interest in different PAYS features. The survey asked how homeowners would react to an offer from the utility to replace first a failed heating and cooling system, then a working (but old and inefficient) system, with a rebate, a PAYS-like utility offer or with their own money. The PAYS-like offer of upgrade costs being repaid through a utility tariff was cash positive in each scenario. Though homeowners' interest in the PAYS offers was lower than the rebate-only offer, a majority of respondents indicated they would accept the PAYS-like offer, regardless of whether the homeowner was replacing failed equipment, replacing working equipment, or contributing a copayment. Among those rejecting the PAYS offers, many respondent comments indicated possible confusion about financial terms of the offer. For example, one-third of those rejecting the offer to replace working equipment said they did so simply because they would never replace equipment that still worked, despite the fact that the upgrade would provide a net cost savings.

The survey asked renters if they would accept a utility offer to upgrade their rental property. The first scenario presented a low savings, low cost offer, and the second a higher savings, higher cost scenario. While a majority of renters were interested, significant number of renters rejected the PAYS scenario due to the split incentive barrier. As the expense of the project increased, the number of renters choosing to participate decreased from 58% to 42%, even though the net cashflow to participants actually improved slightly. The survey format limited Cadmus' ability to explain the program's parameters, and respondents had little incentive to invest in understanding them. Nevertheless, any program offering a product like PAYS would likely face communication barriers more difficult to overcome than those faced by relatively straightforward rebate programs.

Potential Participants

Customers' responses indicate about 10% of homeowners and about 50% of renters use an electric furnace, equipment Cadmus found in previous studies to be the most likely project to provide sufficient savings to allow for full funding under PAYS guidelines, especially if replaced while the older and inefficient equipment is still operable. The survey also found 23% of homeowners and 56% of renters had annual incomes below $50,000, which may qualify them as low-income according to the eligibility criteria used for the KCP&L Income-Eligible Weatherization Program. In addition, data from the U. S. Census Bureau indicate about 35% of KCP&L households rent. For both low-income households and

renters (two groups that have significant overlap), the financing gap analysis identified PAYS as the optimal financing tool.

Administrative Requirements

Based on estimated costs for program administration (including program management, marketing, evaluation, and customer support), the assumed nonpayment loss fund to protect ratepayers and an assumed internal labor requirement of one full-time equivalent staff, PAYS is administratively feasible for KCP&L. PAYS' unique features, including targeting populations with greater credit risk and not relying on credit score for eligibility, may present difficulties in obtaining capital to fund the program. At the same time, credit enhancements that may help overcome some investor hesitation may be viewed by regulators as placing undue risks on ratepayers. On-bill financing type programs from other regions experience extremely low rates of default (typically less than 2% on a dollar or loan basis).

Conclusions and Recommendations

Conclusion 1. Opportunity exists for a utility-sponsored financing program to fill a gap in the financing market and increase residential uptake of energy efficiency improvements.
A PAYS program could potentially overcome financing barriers of credit-stressed borrowers and renters if it provided an affordable interest rate and an easy (or well-supported) participation process, and it used bill payment histories rather than credit score underwriting.

Conclusion 2. While a significant number of customers accepted the PAYS offer, survey responses indicated a significant information barrier for many customers when evaluating this unique program.
Financing is a complex and unfamiliar subject for most people. Although many customers appeared open to the concept of PAYS, a significant percentage rejected the offer for reasons that did not appear to recognize or accept the details of the offer. KCP&L intends to add additional staff to manage its pilot programs. Cadmus expects that this staff will be critically important to ensuring the program delivers a clear, strong message to potential participants, and supports customers as they consider their options.

Conclusion 3. KCP&L's customer base appears to include a large number of homes that would benefit from PAYS.
Results from the survey indicated there is potentially a reasonably large subset of homes in KCP&L territory that could provide significant savings opportunity and be good candidates for PAYS. These initial findings provide justification for more in-depth market research to understand the potential for energy savings and the potential need for PAYS in KCP&L's territory.

Conclusion 4. The primary PAYS barrier for KCP&L will be obtaining regulatory approval for appropriate credit enhancements to attract investors willing to provide low-cost capital.
Finding a program design that balances these competing priorities will likely be the most difficult obstacle to successfully offering PAYS.

Recommendation 1. KCP&L should consider a potential PAYS or similar program, but it should target the program carefully to a specific market segment to ensure it meets customers' needs.

Due to its strict requirements for eligible projects, PAYS will prove unattractive to customers with access to other financing options. Targeting the program to low-income or multifamily populations meets KCP&L objectives for better serving hard-to-reach markets and optimizes the benefits of a PAYS program. The financing needs of low-income homeowners, however, are different from those of renters, as are the needs of those living in single-family homes versus those in multifamily units. KCP&L should conduct analyses to identify the market with the best opportunity to achieve high savings, and consult with financing program experts to design a program that best serves that market. If KCP&L pursues a program targeting the multi-family sector, it should also conduct in-depth interviews or surveys with property owners. It will be important for the program to recognize the needs and potential concerns of this stakeholder group, and there may be potential for property owners to serve as an effective delivery channel for a PAYS program.

Recommendation 2. As early as possible in the development process, KCP&L should address the two primary barriers to successfully offering a PAYS or on-bill program: designing credit enhancements that satisfy regulators and attracting low-cost capital from investors.

KCP&L should work with PAYS experts and other energy efficiency financing experts who may be more knowledgeable about the needs of IOUs and regulators to understand their options with regard to credit enhancements and securing capital. KCP&L should anticipate the need to work closely with regulators and other stakeholders to design the program, and should expect the process required to resolve these barriers will be longer than the typical efficiency program planning process.

Introduction

Kansas City Power & Light (KCP&L) commissioned a study to examine whether a financing program, specifically one based on the Pay as You Save (PAYS) program model, would be a feasible addition to its energy efficiency portfolio. This study addresses whether such a program could drive additional uptake of energy efficiency improvements if added to KCP&L's current demand-side management (DSM) portfolio. To be considered feasible, a PAYS financing program should contribute to increased uptake of energy efficiency improvements, address a gap in the existing market for financing services, and not present legal or regulatory obstacles.

This study focuses on two priority areas to assess PAYS feasibility in KCP&L's territory:

1. Gap and Needs Analysis: An assessment of financing gaps for energy efficiency among customers in KCP&L's service territory; and whether PAYS or another on-bill financing program offers the best approach to address unmet financing needs.
2. Program Requirements and Obstacles: An analysis of the process and requirements needed to launch and administer a PAYS program, including typical stakeholders, key roles and responsibilities, major obstacles and potential solutions, and itemized costs.

About PAYS

PAYS is a trademarked program model used in a number of energy efficiency programs around the country. PAYS typically includes the following key characteristics:

- A tariff or charge on a utility bill that recoups the financed amount over time. The tariff is applied to the meter where the measure is installed, rather than the customer.
- Disconnection for non-payment of the utility bill.
- A statement of estimated average bill savings that exceed PAYS payments (on an annual basis).
- No minimum credit requirement.

Most PAYS programs allow for some customer co-payment if the amount the utility can finance, according to the PAYS formula, does not cover the full cost of the measure. The tariff is based on the amount financed, rather than on the full measure cost.

PAYS offers several advantages. The program's model requires that amounts financed are less than the utility bill savings, which automatically limits eligible measures to those that save energy and provides a value proposition to customers. PAYS' co-payment feature allows a wider array of energy-saving measures to qualify than only those measures that provide enough savings to support the full measure cost. In addition, as a financing program that recoups money given to individuals, plus interest, PAYS has the potential to be less costly than a rebate program.

The program offers another significant advantage: its potential to penetrate segments of the customer base that can be hard to reach through other rebate or financing-type programs. The program can penetrate rental housing due to its tariff structure, which allows renters to make payments only while they enjoy benefits from the upgrade, with no further obligation if they leave the property.

In addition, the proactive delivery model used with most PAYS programs involves concentrated outreach to customers with high energy use (or other indicators of high-energy savings opportunities), providing them with a customized audit and upgrade plan, and, consequently, often replacing working but inefficient equipment. As a result, the program can achieve much higher energy savings than a program more likely to attract customers with failed equipment.[1]

The PAYS model also presents drawbacks. The tariff requirements limit the program to providing a meaningful amount of funding for only a few extremely high-saving measures. While the co-payment provides some flexibility in terms of measures that qualify for PAYS, it also can result in financing amounts considered trivial relative to the measure's overall cost. This presents a particular burden if the program can only claim electricity savings, but the utility has a large percentage of customers using natural gas or other fuels for space heating or water heating.

Finally, as with any financing program, a PAYS administrator must account for the long-term implications of the tariff. The program will need to account for origination, servicing, and collections costs not associated with a rebate program. Outsourcing these functions can result in substantial added expense and can prevent a utility from exercising full control over its relationship with its customer. Whether outsourced or managed internally, utilities must address the long-term nature of the tariff, which may impact multiple customers if new tenants rent the unit or, in the case of a vacancy, the landlord becomes responsible for the payments.

This study explores these issues in depth to examine whether a PAYS program would prove feasible for KCP&L and adhere to best program design practices. More broadly, the study considers the types of financing programs, if any, that would be generally best suited to KCP&L's residential energy efficiency portfolio.

[1] In a replace-on-failure scenario, savings would be relative to relevant code or appliance standards rather to than existing conditions

Methodology

Cadmus conducted primary and secondary research as part of the market analysis and the investigation of program requirements. The research tasks Cadmus completed to inform this study are described in this section.

Market Analysis

This task consisted of conducting a customer survey to gather feedback and to review financing solutions currently in the market.

Customer Survey

Cadmus developed a survey instrument for residential KCP&L customers (i.e., renters and homeowners) to capture information on customers' attitudes and behaviors related to adopting financing for major home upgrades as well as for customer responses to key PAYS features.

Sample

KCP&L delivered the survey to a panel of customers who reside in zip codes corresponding to the utility's territory. Demographic data from the U.S. Census Bureau indicated that 65% of KCP&L customers are homeowners; the remainder are mostly renters. Accordingly, Cadmus set quotas for homeowners and renters to help ensure the sample was representative of the territory. Though the survey did not meet the renter target, but it exceeded the homeowner target. Table 1 presents the target and final sample.

Table 1. Survey Targets and Final Sample

Group	Target	Final Sample
Homeowner	130	321
Renter	70	62

Instrument

Cadmus developed the survey instrument, including detailed programming language, and provided this to KCP&L for review and comment. After integrating comments, Cadmus returned the final instrument to KCP&L for programming. After Cadmus tested the programmed survey, KCP&L staff coordinated with an online survey vendor to deliver the survey to the target audience. Appendix B.a.i.1.a.Appendix A provides a copy of the survey instrument.

Analysis

The survey included separate language for questions delivered to homeowners and to renters, assuming, based on previous financing research, that homeowners and renters have fundamentally different needs for and access to financing (e.g., renters would not be expected to access a home equity line of credit [HELOC]).

This study asked both respondent groups about recent home improvements and payment methods used. Cadmus grouped payment methods into two basic categories:

1. Cash and other non-financing methods
2. Financing methods

Methods categorized as financing were meant to identify those who accepted a financing charge in order to spread payments over time into more manageable amounts. Consequently, Cadmus split credit card purchases into two types, based on whether a balance was carried or was immediately paid off. If the user paid off the purchase immediately and used the card primarily to earn a cash-back reward or credit card points, Cadmus categorized the payment as cash (non-financing). The transaction was considered essentially the same as cash as the respondent spent the project's total purchase price within one month, in paying off the credit card balance.

Additionally, the "Cash" group included two methods that did not involve the respondent's own cash: borrowing the money from a friend, and having someone else pay. Borrowing money from a friend was considered different from financing through formal channels due to informally agreed-upon terms and conditions, and the potential for no obligation to repay.

Credit card purchases paid off over time, indicating the respondent was willing to accept a monthly payment and possibly pay interest, were categorized as financing.

Table 2 lists the methods included in each group.

Table 2. Categorization of Payment Methods in this Study

Cash	Financing
Cash or check	Credit card financing (paid off over multiple months)
Credit card financing (paid off immediately)	Mortgage, home equity, or other secured loan
Borrowed the money from a relative or friend	Unsecured personal loan from a bank or credit union
Someone else paid for it (i.e., a relative or friend)	Contractor or manufacturer financing
Interest or home warranty claim	

Financing Gap Analysis

Cadmus reviewed several financing products, available in the KCP&L service area and commonly used for energy-related home upgrades: credit cards, loans and lines of credit; and property assessed clean energy (PACE) (currently available in KCP&L's territory). Cadmus also reviewed PAYS and traditional on-bill financing programs, modeled on existing versions of these programs. Cadmus compared key features across all products, and then, to identify potential gaps in the financing market, assessed how well each product met the needs of three market target segments:

1. Borrowers with good credit
2. Borrowers with poor credit
3. Renters

Program Requirements and Obstacles

Cadmus conducted an interview with KCP&L staff and secondary research to determine program requirements and potential challenges to implementing a PAYS program or an on-bill financing program.

In-Depth Interview

In a single 80-minute phone interview, Cadmus interviewed two KCP&L staff to learn about KCP&L's history with energy efficiency programs, its basic requirements when considering new program models, and its perspective on the feasibility of various PAYS key attributes.

Secondary Research

Cadmus relied on recently completed feasibility studies for PAYS in Ameren Missouri's and Empire District's territories for acquiring basic information on the requirements to launch and operate PAYS, and findings from currently implemented PAYS and on-bill financing programs. As the author, Cadmus could access these unpublished reports and the primary data collection informing them. The reports were used to source program roles, organizational structures, estimated program costs, potential obstacles to program design and implementation, and other information pertinent to this study.

Findings

This section presents the detailed findings from tasks described in the methodology section, starting with the customer survey results. The next chapter synthesizes the results into actionable recommendations.

Customer Perspective

To assess whether a PAYS financing product would meet the needs of KCP&L customers, it helps to understand attitudes and behaviors related to existing financing products. Cadmus designed a survey to learn about how customers currently pay for major home improvements, their awareness and attitudes about existing payment options, and where customers perceive gaps in the market.

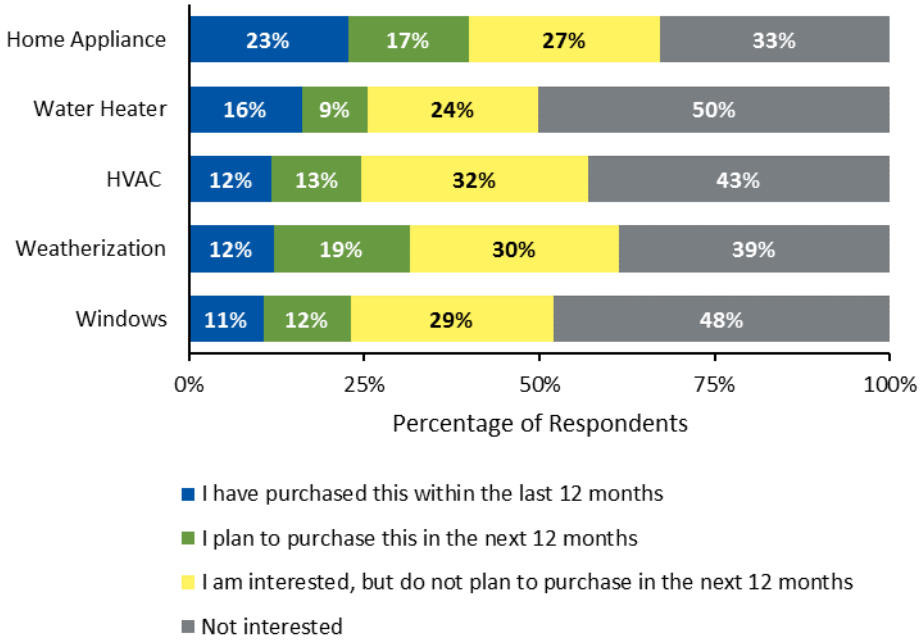
Homeowners

Homeowners and renters have different attitudes about investing in their homes. In addition, homeowners typically have more financing resources than do renters. For this reason, Cadmus looked at the homeowner population separately from the renter population. This section discusses findings from the homeowner population.

Home Improvement Interest and Activity

Homeowners demonstrated strong interest and purchasing activities for energy-related home improvements. The survey specifically asked about five types of common, energy-related home improvements: heating and cooling systems (HVAC), water heaters, home appliances, weatherization, and windows. About 45% of homeowners surveyed had purchased at least one of these items, and 19% had purchased more than one. Figure 1 shows responses by equipment types. Between 12% to 23% of homeowners purchased each type of item, while 34% to 49% indicated they planned to buy or were interested in each item.

Figure 1. Interest in Energy-Related Home Improvements

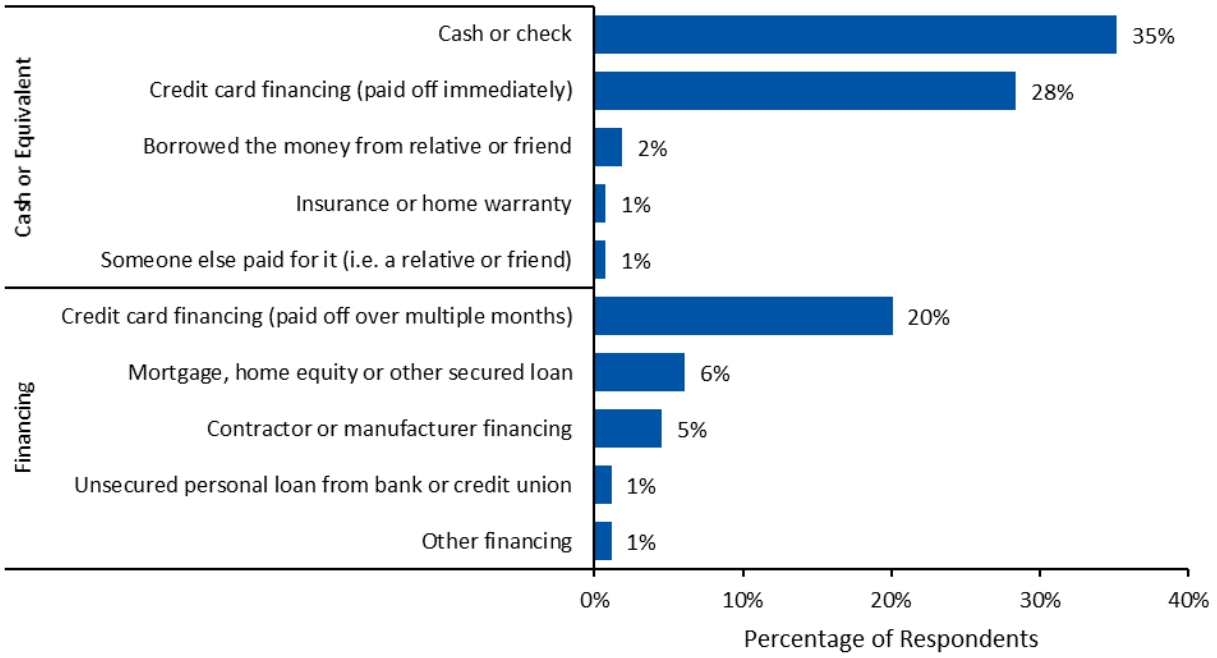


Source: KCP&L Customer Survey, A6, n=321

Of the 45% of homeowners making an energy-related purchase, the majority (80%) indicated they purchased an ENERGY STAR-certified item. While self-reported survey results are not the most reliable method to determine efficiency levels, the results indicate interest in energy efficiency among KCP&L customers.

The survey asked all homeowners to describe a recent home improvement purchase, seeking to understand homeowners' decision-making processes and their perceived payment options. Purchase activity among homeowners indicated that they already commonly used financing to purchase major household improvements. While the most common payment methods were cash or a credit card with the balance paid off immediately, about one-third of homeowners (33%) chose some type of long-term financing to pay for their projects. Credit cards with the balance paid off over time, were the most commonly used financing type, followed by property-secured products (such as mortgages) and contractor or manufacturer financing. Unsecured loans and products such as PACE or store layaway programs were used by less than 2% of homeowners. Figure 2 shows the distribution of payment methods used by homeowners for recent home purchases.

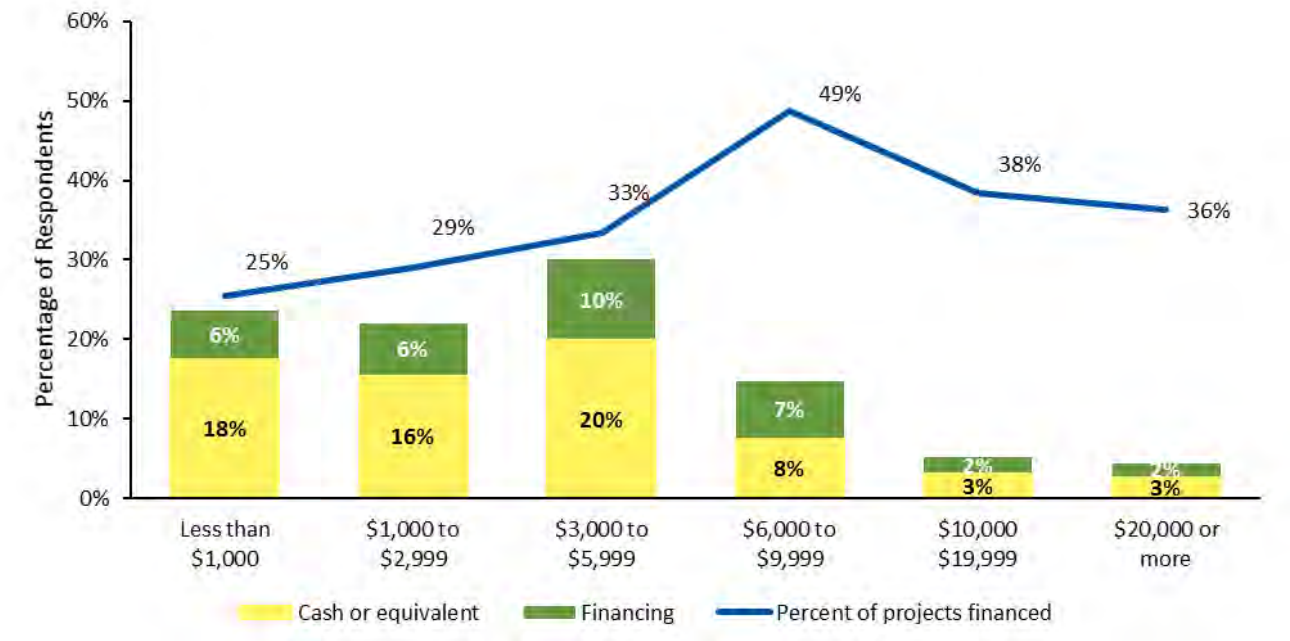
Figure 2. Payment Methods Used by Homeowners for Recent Projects



Source: KCP&L Customer Survey, D5, n=268

Reported project costs varied from $100 to $48,000. Figure 3 shows the distribution of project values by payment methods (cash or financing). The proportion of homeowners financing their projects peaked in the $6,000 to $9,999 range, with nearly 50% of projects financed; this decreased to fewer than 40% for projects over $10,000.

Figure 3. Homeowner Payment Method by Project Costs

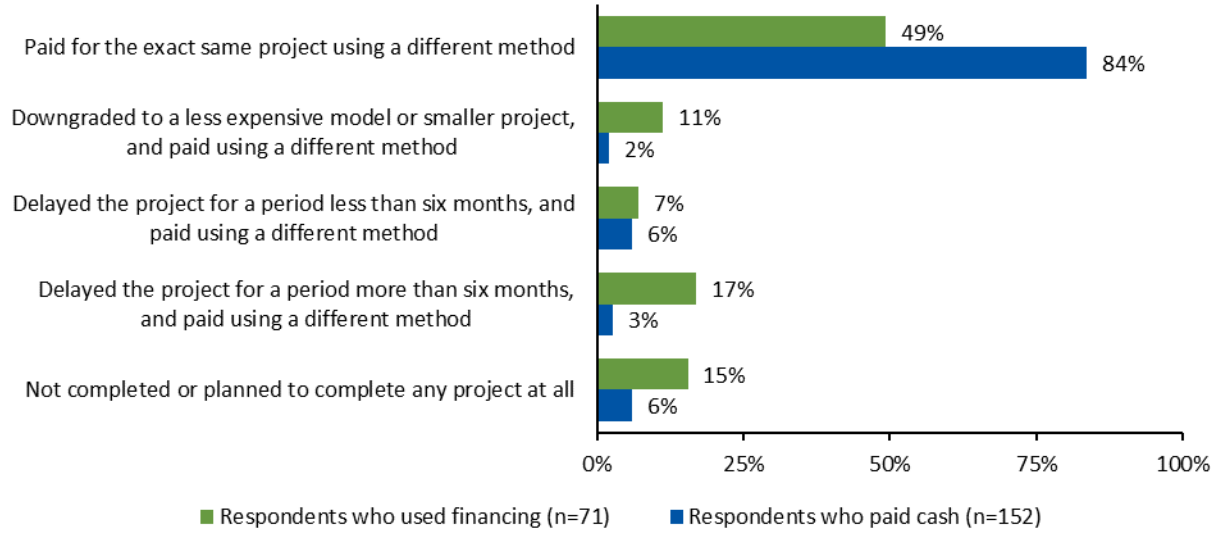


Source: KCP&L Customer Survey, D4, n=250

Need for and Access to Different Payment Options

When asked what they would have done had the payment method they used not been available, the majority of respondents reported they would have used a different method to pay for the exact same project. As shown in Figure 4, however, homeowners that financed their projects were more likely (than those using cash) to downgrade to less expensive projects, delay their projects for more than six months, or not complete their projects at all.

Figure 4. Homeowner Alternative Purchase Decision



KCP&L Customer Survey, D10

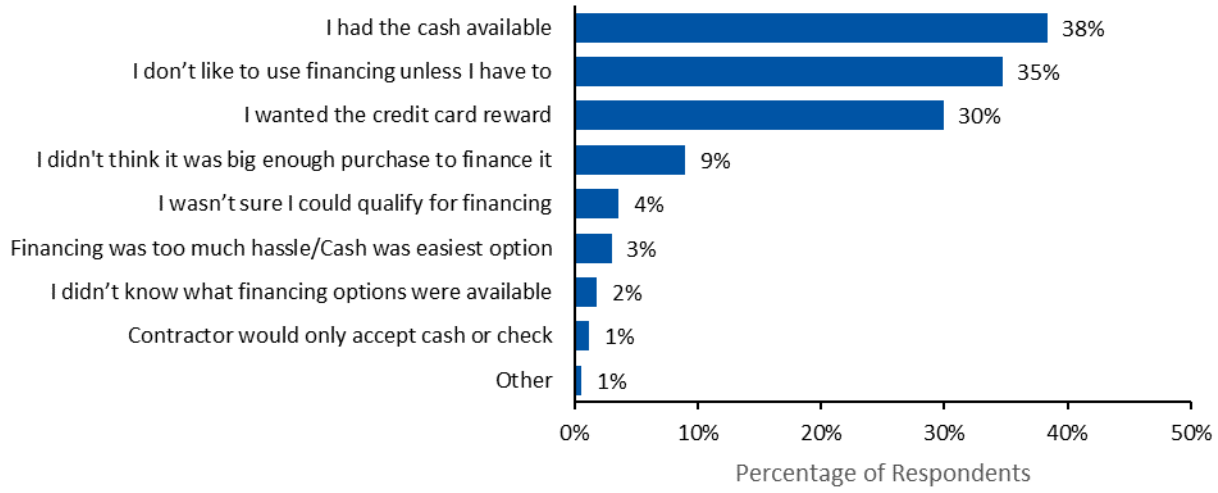
The survey asked homeowners making an energy-related home improvement to explain why they chose the payment method used. As shown in Figure 5, those using a cash or cash-like method most commonly indicated paying cash simply because they had the cash available (38%).[2] However, 35% of homeowners paying with cash also said they did not like to use financing unless necessary, which may present a potential barrier to larger or more energy-efficient purchases. Other responses indicating financing-related barriers included:

- Fear of not qualifying for financing (4%)
- Financing presenting too much of a hassle (3%)
- Not knowing what financing options were available (2%)
- Contractors not accepting payments in forms other than cash or checks (1%)

[2] Table 1 in the Methodology section describes how this study grouped payment methods into cash and financing categories.

In total, 47% of homeowners paying cash or a cash-like method for a project indicated barriers prevented using available financing methods.

Figure 5. Reasons for Paying with Cash



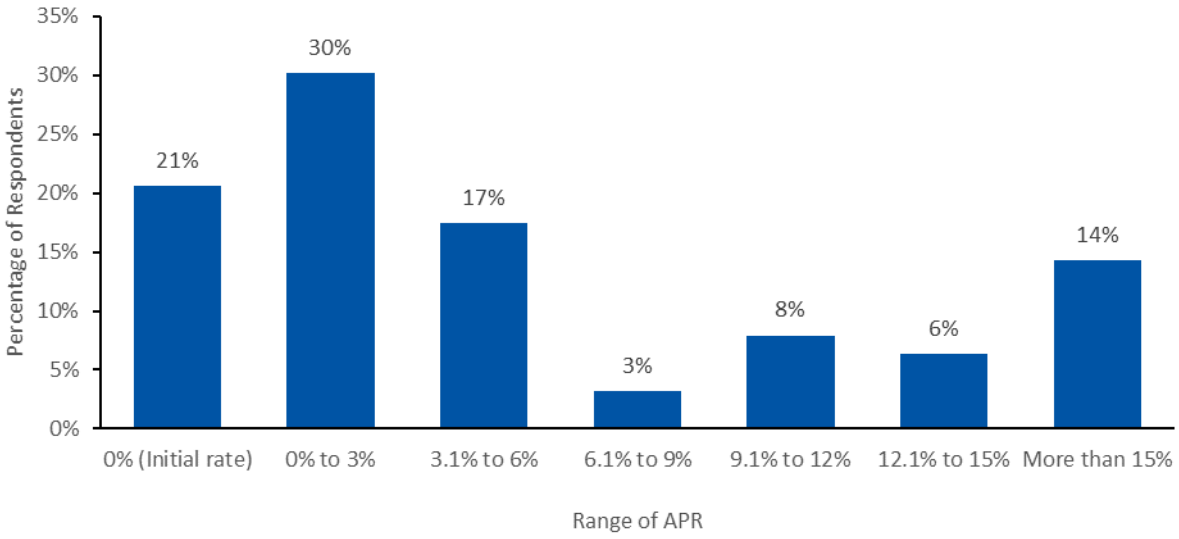
Source: KCP&L Customer Survey, D6, n=167. Multiple responses allowed.

The majority of homeowners that used financing, 94% (n=81), indicated they used the financing as they wanted to preserve their savings. Another 61% did not have sufficient cash available. Some respondents were also motivated by a good financing deal, such as getting points on their card (19%), or rolling the amount into a low-interest mortgage (5%). Three respondents (4%) indicated that they wanted their monthly energy savings to be more than their monthly payments.

Preferred Financing Features

As shown in Figure 6, the majority of homeowners (68%) that used financing reported an APR of 6% or less. Although 21% of respondents indicated paying 0% APR, this was an initial rate, implying the loan would reset to a higher APR at a predetermined future date.

Figure 6. Homeowners' Reported APRs

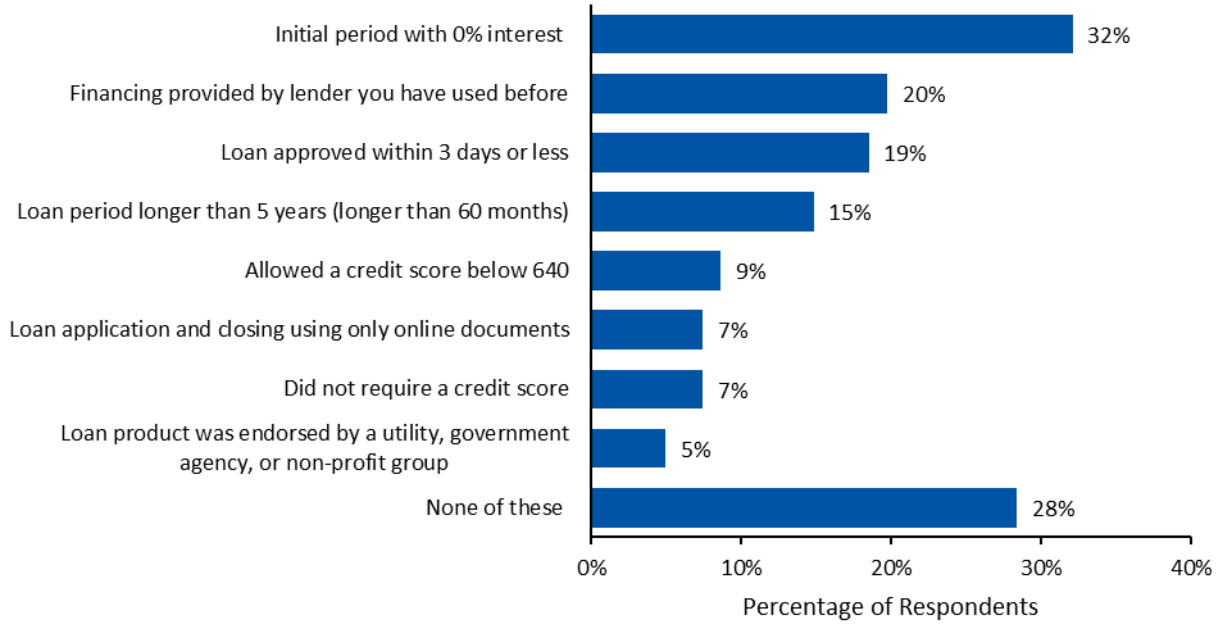


KCP&L Customer Survey, D8, n=58

In fact, as shown in Figure 7, homeowners reported that an initial 0% interest rate was the most commonly reported feature of financing products chosen. Convenience features, including using a product from a known lender and getting the loan approved within 3 days, were also commonly reported, followed by loans lasting longer than 60 months.

Though a minority, a substantial number of respondents—15%—indicated that their chosen financing method served credit-stressed borrowers, by allowing a credit score below 640 or not requiring a credit score. (Percentages do not sum because some respondents selected both features.)

Figure 7. Features of Homeowners' Financing Methods

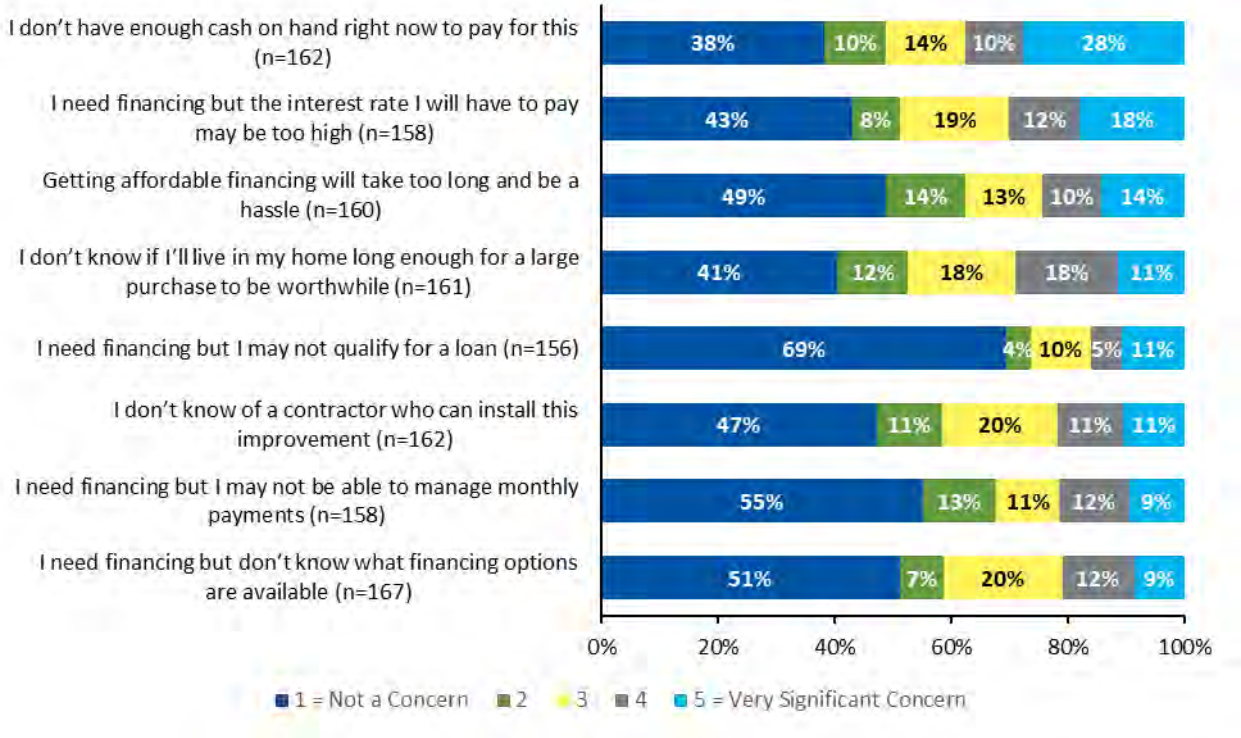


KCP&L Customer Survey, D9, n=81. Multiple responses allowed.

Barriers to Home Improvements

The survey asked customers to rate eight potential barriers they might encounter if suddenly required to make a home improvement valued at around $5,000, with responses ranging from 1 (not a concern) to 5 (a very significant concern). Figure 8 shows ratings for each barrier. Of all barriers considered, not having sufficient cash on hand was most likely to be a significant concern, with 38% of respondents ranking it a 4 or a 5 (significant or very significant concern). This was followed by available interest rates being too high, rated 4 or 5 by 30% of respondents. The ability to qualify for a loan was the least likely to be rated a significant concern, with only 16% of respondents ranking this barrier a 4 or a 5.

Figure 8. Homeowners Level of Concern for Potential Barriers



Source: KCP&L Customer Survey, C3

Willingness to Accept PAYS Features

PAYS incorporates several unique features that most people are not accustomed to considering when thinking about payment or financing options. These include the "tied to the meter" tariff aspect, the guaranteed positive cash flow, and the utility endorsement. Cadmus used the customer survey to collect information on customer attitudes towards these features, design to assess whether the market would be open to a PAYS financing product.

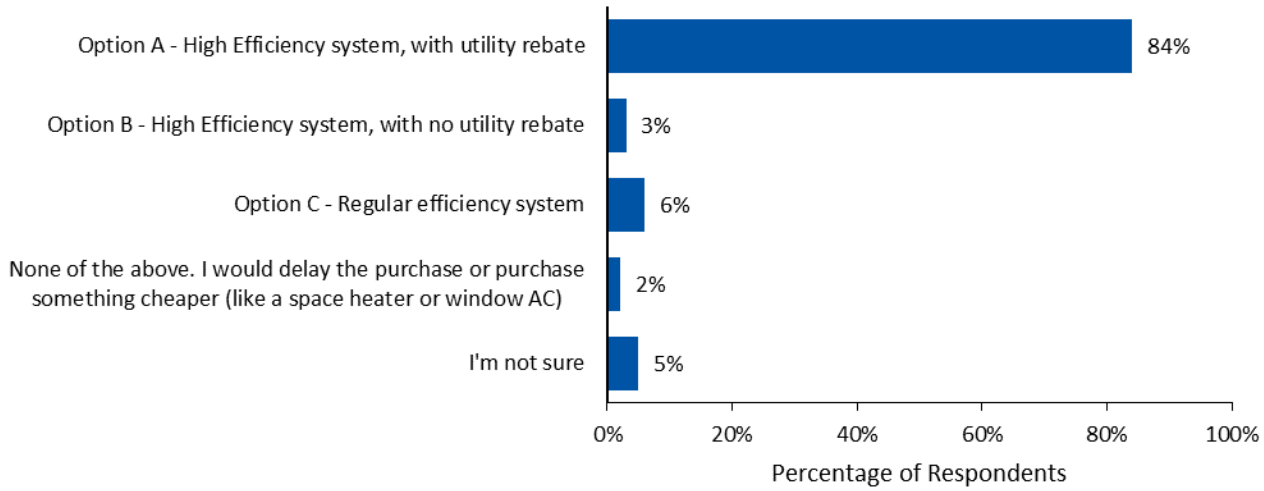
To evaluate openness to PAYS-specific features, the survey presented customers with a series of hypothetical scenarios about a home improvement project or opportunity. Each scenario layered on certain features of PAYS. By comparing responses to these different scenarios, Cadmus evaluated the relative interest in PAYS among KCP&L's customer base.

The scenarios generally addressed HVAC replacement as this served as a standard measure in PAYS-funded projects. The first scenario presented a rebate-only option:

Scenario 1: *"Imagine your central heating and/or cooling system breaks and you need to replace it* immediately. *A standard-efficiency system will cost about $4,500. If you buy a high-efficiency system instead, at a cost of about $5,000, your utility will offer you a rebate of $100. The high-efficiency system would save you about $50 per year on energy costs* ***compared to a new standard-efficiency system*** *and has additional features such as quieter operation."*

The majority of respondents (84%) selected the rebate option, as shown in Figure 9.

Figure 9. Homeowner Response to Scenario 1 (HVAC Only, Rebate Only)



KCP&L Customer Survey, B1, n=320

In the next scenario, the utility offered respondents financing as well as a rebate:

Scenario 2: *Now, again imagine **your heating and cooling system has failed** and you need to replace it. In addition to the rebate, imagine your utility offers a program to finance the remainder of the cost. The program works like this:*

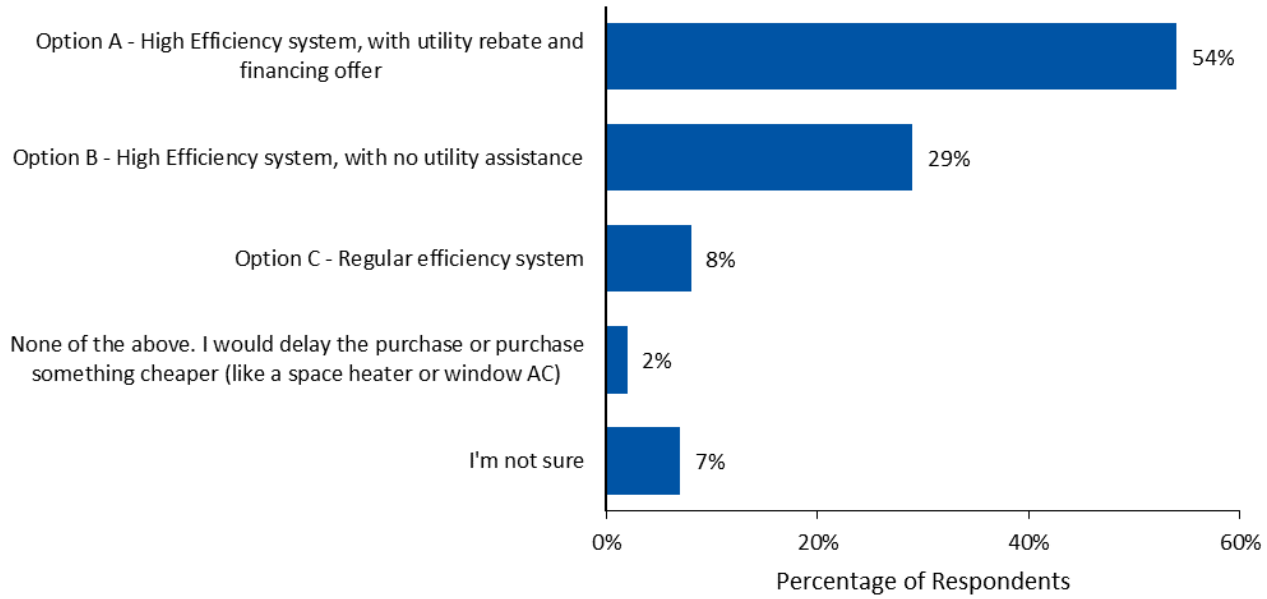
- *The utility would provide $100 to the contractor as a rebate and finance $4,900.*
- *You would pay $0 up front.*
- *The financing requires no credit check, only that you are current on your electric bill.*
- *You would repay the loan as an extra $40 charge each month on your electric bill ($480 per year) for about 14 years.*

*The high-efficiency system would save you about $50 per year on energy costs **compared to a new regular efficiency system** and has additional features, such as quieter operation.*

Under this scenario, the percentage of respondents interested in the utility offer decreased from 84% to 54%. Among 117 respondents selecting Option A in Scenario 1 but not Scenario 2, 74% chose Option B in Scenario 2. In other words, these respondents still selected the high-efficiency option, but they rejected the utility financing offer. At the same time, 38% (n=34) of respondents selecting Option C (the regular system) or saying they were not sure in Scenario 1 selected Option A (the high-efficiency system) in Scenario 2. Though a much smaller group, these respondents represented a subset of customers not persuaded to purchase a high-efficiency system solely through a rebate, but were persuaded by a rebate combined with the PAYS offer.

When asked why they would not choose the utility offer, respondents not selecting Option A for Scenario 2 most commonly said they would rather pay cash (26%, n=145), always avoid financing if possible (17%), felt the 14-year term was too long (13%), or just were not interested (13%).

Figure 10. Homeowner Response to Scenario 2 (HVAC Only, Rebate and Financing)



KCP&L Customer Survey, B3, n=321

In other analyses of PAYS feasibility, replacing working electrical heating equipment with a high-efficiency heat pump was the only project that generated sufficient savings to allow administrators to finance full project costs under PAYS guidelines.[3] To test customer willingness to replace working equipment, the survey presented a third scenario:

Scenario 3: *This time, imagine your utility offers a $100 rebate plus full financing for a new high-efficiency system to replace your **working heating and cooling equipment.** Assume your heating and cooling system is at least eight years old and not very efficient. The utility is offering this program to help you upgrade to higher-efficiency equipment, so you use less energy and have lower bills.*

The program works the same way as in the previous scenario:

- *The utility would provide $100 to the contractor as a rebate, and finance $4,900.*
- *You would pay $0 up front.*
- *The financing requires no credit check, only that you are current on your electric bill.*
- *You would repay the loan as an extra $40 charge each month on your electric bill ($480 per year) for about 14 years.*

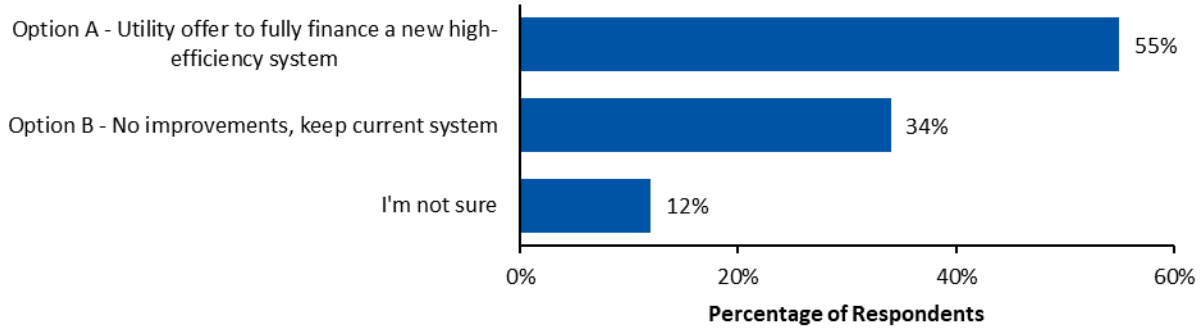
*You would save about $54 per month, or $650 per year in utility bills compared to your **current inefficient system**, for a net savings of $170 per year off your utility bill. The new system also heats and cools more evenly, and operates more quietly. Note that you will save more off your bills in this scenario because most older equipment, like the eight-year-*

[3] Cadmus. Unpublished research for Ameren Missouri and Empire District.

old system mentioned here, is less efficient than even the standard efficiency models available for sale now.

In this scenario, the respondent had two alternatives: accept the utility offer; or continue using their current working equipment. As shown in Figure 11, the 55% selecting the utility offer to replace working equipment was very similar to Scenario 2, in which respondents could opt to replace failed equipment. Across the two scenarios, however, respondents did not provide consistent choices. Of respondents selecting the high-efficiency system (Option A or B) in Scenario 2, only 61% (n=265) chose to upgrade working equipment (Option A) in Scenario 3, despite that, for both scenarios, the high-efficiency upgrade project saved more money each month than it cost. This result implies that immediate need had greater influence on customers' decision-making than did long-term cash flows.

Figure 11. Homeowner Response to Scenario 3 (Replace Working HVAC, Full Financing)



KCP&L Customer Survey, B5, n=321

Respondents' explanations for not accepting the utility offer in Scenario 3 indicated that respondents might not have fully understood the financial implications. They most commonly explained that they did not want to replace working equipment (33%, n=100) or did not want to spend money unless necessary (13%). These explanations indicated respondents may not have understood that upgrades would neither require them to spend cash, nor increase their monthly bills. Scenario 3 presents several communication challenges, which this survey could not fully overcome:

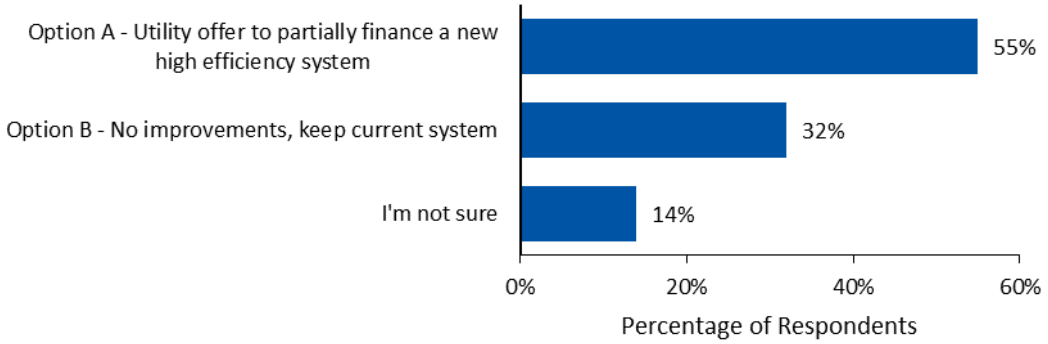
- It is an unusual home improvement for most people
- It is an unusual financial transaction
- It is a relatively complex financial decision, regardless of payment methods.

Program administrators making similar offers to customer would likely face similar communication challenges.

In the fourth homeowner scenario, the survey repeated Scenario 3's offer, except asking respondents to contribute $1,000 of project costs upfront (known as a co-pay in a PAYS context). Because PAYS requires payment for the funded amount to be less than the monthly savings, customer co-pays sometimes are necessary to reduce the total funded amount.

As shown in Figure 12, this produced results almost identical to those of Scenario 3. Of respondents choosing Option A in Scenario 3 (to replace their working equipment), 86% again chose Option A in Scenario 4. Addition of a copayment appeared to have minimal impacts on customers' choosing to accept the utility offer to fund replacing their working equipment.

Figure 12. Homeowner Response to Scenario 4 (Replace Working HVAC, Partial Financing, and Co-Pay)



KCP&L Customer Survey, B7, n=321

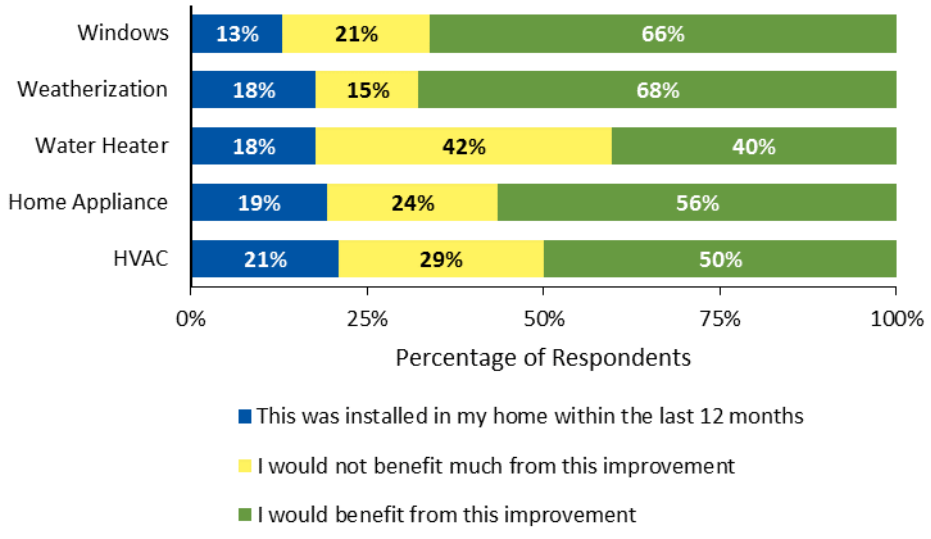
Renters

This section discusses renters responses to a similar set of questions to that presented to homeowners.

Home Improvement Interest and Activity

As shown in Figure 13, renters reported similar equipment purchasing rates as homeowners, with 13% to 21% of respondents reporting each type of energy improvement installed in their homes.

Figure 13. Interest in Energy-Related Home Improvements



Source KCP&L Customer Survey, A8, n=62

A total of 18 renters (29%) reported one of the energy-related improvements was installed in their homes during the last 12 months, and 4 of these respondents reported the upgrade was ENERGY STAR certified.

Nine renters reported paying for a home improvement project, with project costs ranging from $793 to $5,000, with an average cost of $1,666. This question was not limited to the energy-related projects in Figure 13, but one respondent purchased a water heater, one purchased a major household appliance, and two said they purchased all or part of an HVAC system. The nine respondents that reported paying for a project used a variety of payment methods. Two said someone else paid for the project; and one each indicated the following:

- Borrowing the money from a relative or friend
- Paying cash
- Using a credit card payment, paid off immediately
- Using an unsecured loan
- Using contractor or manufacturer financing

Two respondents did not indicate payment methods.

Need for and Access to Different Payment Options

The survey asked the renters the same questions about their need and access to financing that it asked homeowners. The two respondents paying cash or using their credit cards reported doing so as the cost was too small to finance, and they had the cash available. The two respondents who had someone else pay or borrowed money from friends said the project was too expensive (one); they did not use financing unless they had to (one); and financing was too much hassle (two). Respondents using a financing product did so as they had insufficient cash.

Two renters said they would have completed the exact same project and paid in a different way, had their chosen payment method not been available: one paid for their project with cash; the other did not specify a payment method. Of the remaining seven respondents, two said they would have downgraded their project, two would have delayed for less than six months, one would have not completed the project, one would have rented appliances, and one did not specify.

Preferred Financing Features

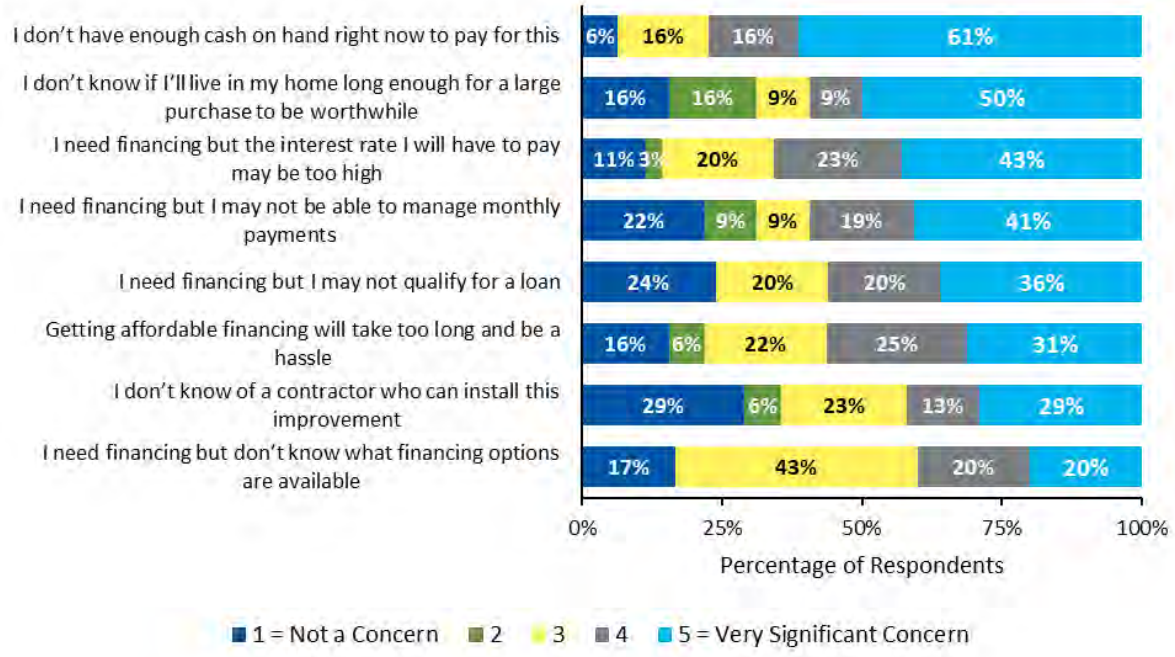
The respondent using an unsecured loan paid a 23% APR, the unsecured loan was approved within three days, and it allowed a credit score below 640. The respondent using contractor financing did not provide an APR, but said the loan offered online applications and closing documents.

Barriers to Home Improvements

As with homeowners, the survey asked renters to rate eight potential barriers to making home improvements, valued at around $5,000; ratings ranged from 1 (not a concern) to 5 (a very significant concern). Figure 14 shows renters' average ratings for each barrier. In general, renters indicated a high concern levels for most barriers mentioned, relative to homeowners (shown in Figure 8). Renters

expressed the greatest concerns with not having sufficient cash available, with 77% of renters assigning this a 4 or 5. Other financing-related concerns (e.g., paying a high interest rate, managing monthly payments, qualifying for a loan, and hassles in obtaining financing) were rated as 4 or 5 by more than one-half of respondents. Concerns about whether they would live in the home long enough to make the expense worthwhile was the second most likely concern to be rated a 5, receiving a 4 or 5 by 59% of respondents. Not knowing about available financing options presented the least significant concern, but was nevertheless rated 4 or 5 by 40% of respondents.

Figure 14. Renters Level of Concern for Potential Barriers



Source: KCP&L Customer Survey, C3, n=31 – 32

Willingness to Accept PAYS Features

The survey asked renters to consider a series of scenarios, designed to determine whether renters would be open to participating in a PAYS or another energy financing program. The first scenario presented to renters was a lower-cost weatherization project, with low monthly payments and low monthly savings. The second scenario proposed a more expensive project that included an upgraded HVAC system, and offered much higher savings (but also required high payments). As required by PAYS, the scenarios indicated monthly payments lower than expected monthly savings.

Scenario 1 follows below:

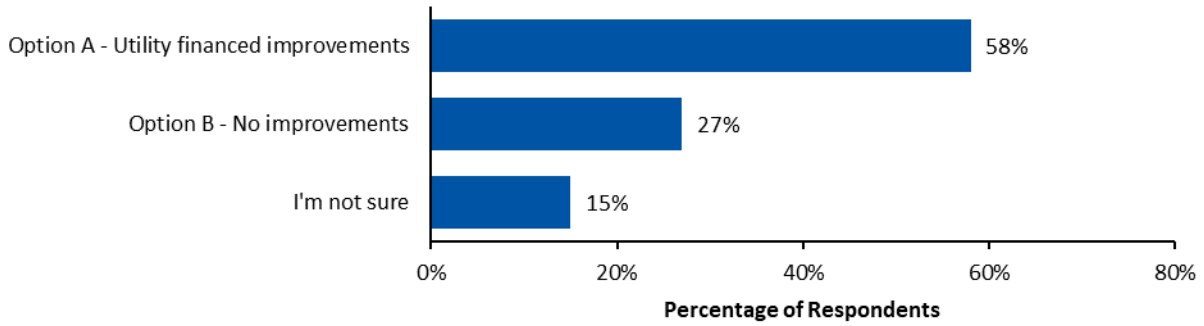
Scenario 1: *First, imagine your utility offers a program through which they will make improvements to your home that save energy and make your home more comfortable, such as air-sealing and attic insulation. The utility provides a custom home energy audit that determines the improvements will save you $240 a year on energy bills, in addition to making the home more comfortable. The program works like this:*

- *The utility will pay the upfront cost of these improvements, about $1,500.*
- *You would pay an extra charge of $15 per month on your bill ($180 a year) until the cost of the improvements is repaid or until you move out.*

Your landlord tells you they have agreed to the improvements.

As shown in Figure 15, the majority of renters (58%) indicated they would participate in this scenario. Renters, however, face a unique barrier to energy efficiency improvements—the split incentive: while a landlord would own the improvement, the tenant would benefit from the savings. Although PAYS is designed to overcome this barrier by asking renters to make payments for an improvement only as long as they benefitted from the savings, 17% of renters (10 respondents) nevertheless rejected Scenario 1, saying they would not make improvements to a property they did not own. Another six said that monthly payments would be too expensive, indicating they may not have understood the scenario's financial implications. Others said they needed more information (three), the savings were too low to make the project worth the hassle (one), or they just were not interested (two).

Figure 15. Renter Response to Scenario 1 (Low-Cost Weatherization)



KCP&L Customer Survey, B9, n=62

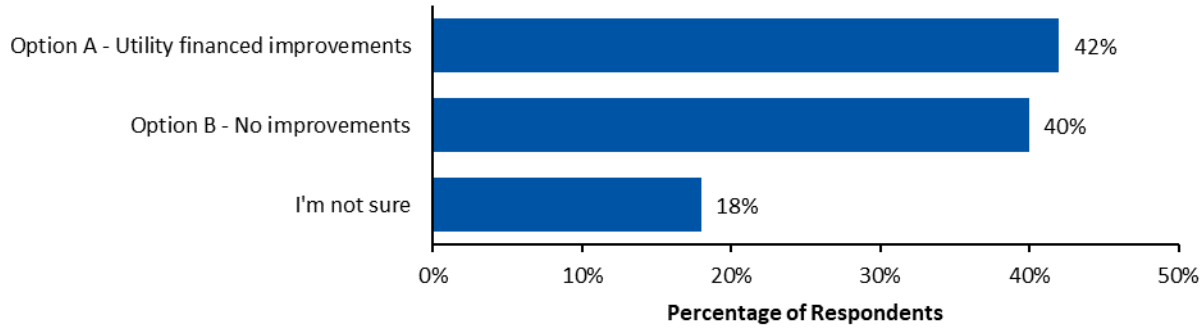
The second renter scenario proposed a more expensive project, but also yielded greater savings:

Scenario 2: *Now, suppose your home has very high energy costs. Your utility offers to include a new heating and cooling system in addition to the other improvements, for a total value of $7,500. The improvements would reduce your energy costs by $1,200 a year, and you would have an extra charge on your utility bill of $80 a month ($960 a year) for about 10 years. Again, you are not responsible for any remaining payments if you leave the rental before 10 years.*

As shown in Figure 16, renters accepting the utility offer in the second scenario dropped to 42%. Of 36 respondents selecting Option A in Scenario 1, 14% (five respondents) said they were not sure if they would accept Option A in Scenario 2, and 31% (11 respondents) selected Option B. Of 26 respondents that did not select Option A in Scenario 1, 23% (six respondents) selected Option A in Scenario 2. Of respondents selecting Option B, 52% (15 respondents) considered the payments too expensive, indicating the survey did not effectively communicate the financial details or the respondents did not believe them. Again, several respondents choosing Option B referenced the split incentive: six said they

rented; and four said they would not invest in a rental property. Another two respondents said savings were too low to make the program worth the effort.

Figure 16. Renter Response to Scenario 2 (High-Cost HVAC and Weatherization)



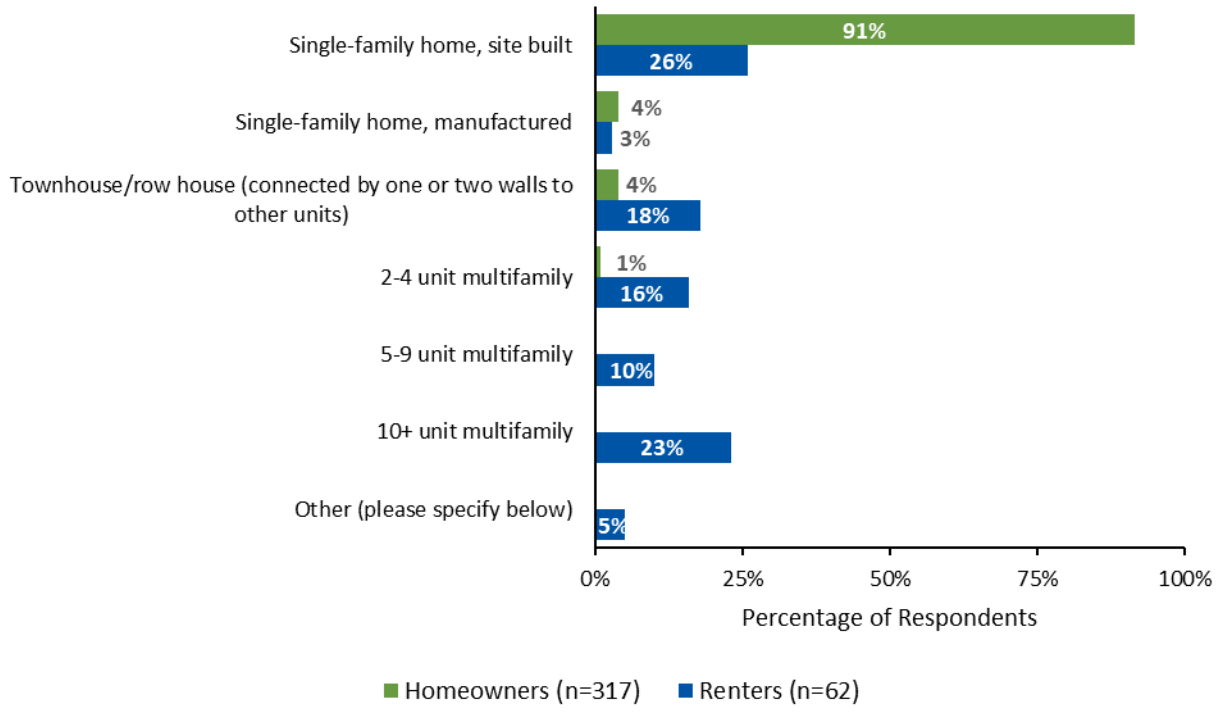
Demographics

Cadmus relied on three data sources to characterize the residential housing market in KCP&L territory: data from the U. S. Census Bureau, the customer survey data, and KCP&L customer data. Each source provided key metrics for understanding the potential of a PAYS or PAYS-like program in KCP&L territory.

The U. S. Census Bureau estimates approximately 65% of housing units in Missouri counties served by KCP&L were owner-occupied. Appendix C provides homeownership estimates by county, with additional demographic data. KCP&L data supported this estimate, showing about 66% of residential meters are identified as serving single-family homes.

Customer survey data (Figure 17) show the majority of homeowners lived in single-family, site-built homes. On the other hand, renters were distributed across several home types, with 26% in single-family homes, but 49% in buildings with two or more units, and the remainder in townhouses, manufactured homes, or other home types (such as nursing homes).

Figure 17. Respondent Home Type

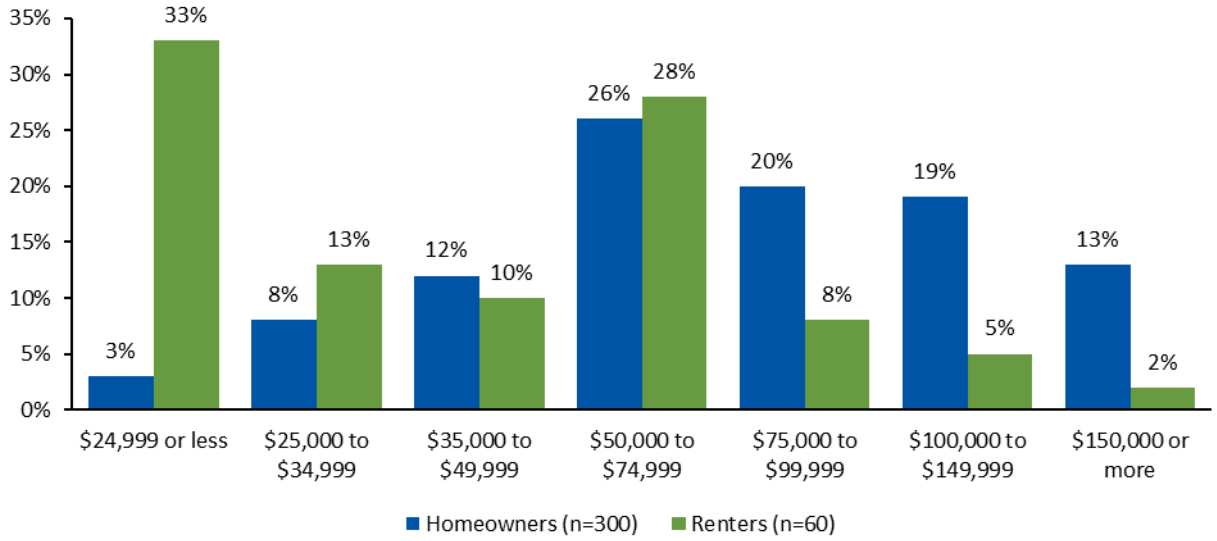


KCP&L Customer Survey, E1, n=379

Figure 18 shows the income distribution among renter and homeowner populations. Renters were more likely than homeowners to have an income below $25,000, and were less likely than homeowners to have an income above $74,999. Overall, about 23% of homeowners and 56% of renters had incomes under $50,000 a year, which may qualify them as low-income homes.[4]

[4] The KCP&L Income-Eligible Weatherization Program requires an income below about 200% of the Federal Poverty Guidelines, or between $24,280 for an individual to $84,760 for a family of eight. For a family of four, the threshold to qualify for the program is an annual income of $50,200 or less. (KCP&L Income-Eligible Weatherization, https://www.kcpl.com/save-energy-and-money/home/programs/income-eligible-weatherization.)

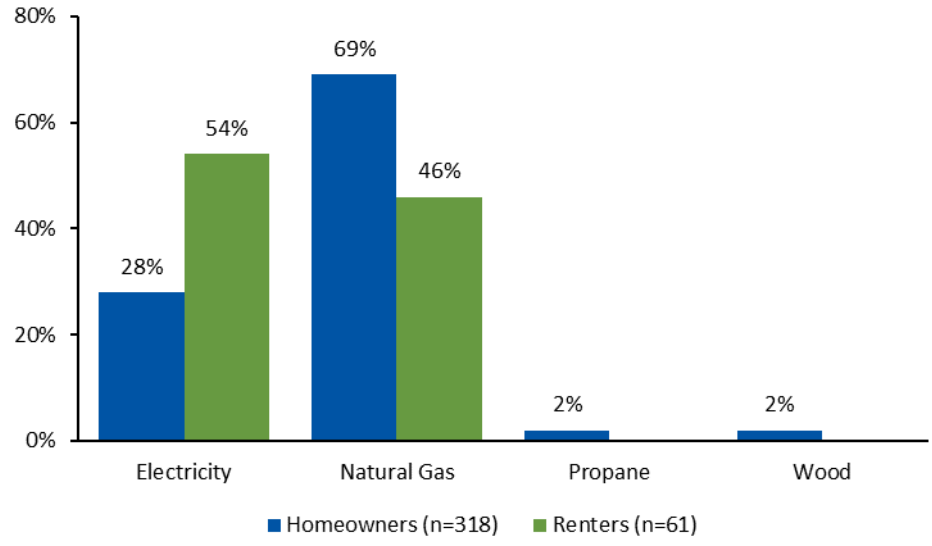
Figure 18. Homeowner and Renter Income Distribution



KCP&L Customer Survey, F1, n=360

Other PAYS feasibility studies have shown that project savings must be extremely high to generate saving necessary for PAYS to cover most or all upfront project costs. Upgrading working electric furnaces to high-efficiency heat pumps is one of a few project types likely to consistently provide sufficient savings to support full project funding. Figure 19 shows 28% of homeowners and 54% of renters reported using electricity for space heating.

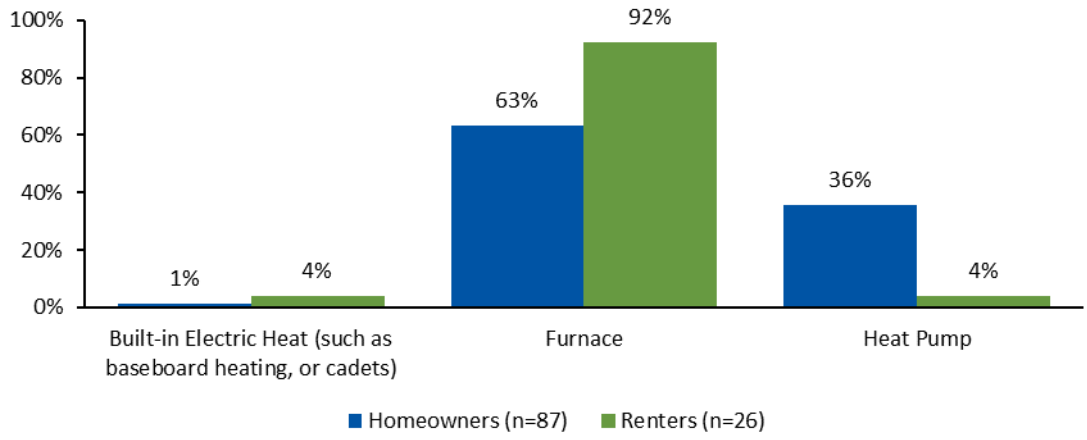
Figure 19. Space Heating Fuel



KCP&L Customer Survey, E2

As shown in Figure 20, nearly-two thirds of the homeowners with electric heat reported their home used an electric furnace, representing about 10% of all homeowners. On the renter side, about 50% reported using an electric furnace (92% of the 54% with electric heat). While self-reported data do not offer the best approach for obtaining precision estimates heating equipment distributions, this result provides a strong indication that replacing working electric heating equipment may apply to a substantial number of homes.

Figure 20. Heating Equipment Type in Homes with Electric Space Heating



KCP&L Customer Survey, E2 and E3

As shown in Table 3, KCP&L customer data indicates that, of 356,144 single-family meters, nearly a third (29%) have a rate class indicating electric space-heating. These homes having an average annual electricity consumption of 16,095, which is 47% higher than the average annual consumption for a home with a general service rate class (the majority of which likely do not have electric space heating equipment). These customers are the most likely to benefit from the high-saving efficiency measures that best support a PAYS tariff. (See Project Requirements for a more detailed discussion.)

Table 3. Single-Family Meters by Rate Class

Rate Class Category	Quantity of Meters	Percent of Single-Family Home Meters (%)	Average Annual Usage (kWh)
Residential, General Service	241,155	68%	10,894
Residential, Electric Heat	101,648	29%	16,095
Residential, Other Designation	13,341	4%	6,078
Total	**356,144**	**100%**	**12,198**

Source: KCP&L Customer Database. Appendix D provides the KCP&L rate classes included in each category.

Financing Gap Analysis

Cadmus conducted a qualitative analysis of six financing products to assess the affordability and accessibility of financing products currently available in the market, and the potential for a utility

financing or tariff program to fill any market gaps. Cadmus reviewed each product's total cost and potential for offering a low monthly payment to evaluate its affordability. General accessibility was evaluated through review of the following features of each product:

- Available loan amount
- Project eligibility requirements
- Ease of use
- Customer eligibility requirements

Finally, the study assessed how accessibility of each product differed for borrowers with good credit, borrower's with poor credit, and renters.

Financing Product Descriptions

The gap analysis considered specific examples of four financing products currently available in KCP&L territory (a credit card, an unsecured personal loan, a HELOC, and PACE financing) as well as the two program offerings under consideration in this report, PAYS and on-bill financing.

For each type of product or program, Cadmus identified an actual example on which to base our assessment of available features, to the extent information on that product or program was available. Table 4 lists the six types of products assessed and the specific example referenced, and the source for information on each example product or program. A general description of each product type is presented below.

Table 4. Financing Products Considered in Financing Gap Analysis

Product type	Reference Example	Source
Credit Card	VISA Classic Credit Card from Joplin Metro Credit Union (Joplin, MO)	https://joplinmcu.com/products/visa/visa-classic/
Unsecured Personal Loan	Great Plains Credit Union Personal Loan (Joplin, MO)	https://www.greatplainsfcu.com/loans/rates
Home Equity Line of Credit	Commerce Bank Home Equity Line of Credit (Multiple locations)	https://www.commercebank.com/personal/borrow/home-equity/home-equity-line-of-credit
PACE	Missouri Clean Energy District/HERO PACE (multiple locations)	https://www.mced.mo.gov/
On-Bill Financing	Illinois EELP (Illinois IOU territory)	http://ilenergyloan.wpengine.com/comed-overview/comed-residential-overview/comed-heating-and-cooling/
PAYS	PAYS (Modeled on Ouachita Electric Cooperative program, excepting the interest rate. Cadmus used the Illinois EELP'S interest rate as more representative of what KCP&L might be able to obtain.)	http://www.oecc.com/pdfs/Ouachita%20Electric%20HELP%20PAYS%20Program%20-%20First%204%20Months%20of%20Activity.pdf

Traditional Private-Sector Financing Products

There is a wide variety of products and lenders offering traditional private-sector credit options in KCP&L territory, including secured and unsecured products, and revolving and single-use products.

These products can be used for energy and non-energy purchases. The process to obtain the financing, and the available terms and conditions, vary widely but in general all have a few common components:

- An application process that requires the borrower to provide detailed personal financial information,
- Qualification based on a credit score, among other factors; and,
- An obligation to repay the amount borrowed that has no relationship to the borrower's ability to benefit from the purchase.

Secured products are available to borrowers with a significant asset, such as real estate or an automobile. These are typically less expensive because the lender secures their investment by placing a lien on the property. Common secured lending products used for home upgrades include single-use products like mortgages and second mortgages, and revolving products like HELOCs. Unsecured products do not require the borrower to have any major assets, but have correspondingly more expensive interest rates, and may offer more limited financing amounts with more restrictive terms. Unsecured products single-use products include personal or signature loans, and manufacturer and contractor financing products, while the credit card is the most common unsecured revolving product.

For the comparison analysis, Cadmus selected specific credit card, unsecured loan and HELOC products offered by lenders in KCP&L territory. The specific product examples were selected at random. Each product is considered to be representative of its product type, based on the authors' experience.

Property-Assessed Clean Energy

PACE financing allows a local government—whether a county or a city—to provide or enable financing for a home improvement project and to recover the loan through the property tax bill. As the loan is secured through the property tax obligation, it does not have a credit score requirement. It also allows property owners to borrow up to 85% or 90% (depending on the jurisdiction) of available equity in the home—a much larger sum than that available through most traditional financing vehicles. PACE offers terms comparable to a home equity line of credit, up to 20 years, that can provide very low monthly payments relative to unsecured products.

PACE financing, usually intended to support conservation broadly, may allow water conservation measures as well as energy conservation. As the financing is not sponsored by a utility, it usually does not include a quantified energy savings target, allowing PACE programs to include less cost-effective measures that those typically excluded from utility rebate programs, but which may still provide a savings benefit over substitute products. The most well-known residential PACE program is the HERO program in California, administered by Renovate America. This same program is available in KCP&L's territory, sponsored by the Missouri Clean Energy District.

On-Bill Financing

On-bill financing programs involve a loan from a lender—either the utility or a utility agent—to the borrower, a utility customer. On-bill financing programs allow utilities to ensure that an affordable financing option is available for purchases of approved equipment. Programs provide guidance to

customers by identifying high-efficiency measures eligible for financing, and often by managing a network of trained trade allies that can support customers through the application process.

Although many on-bill programs are credit-based, a utility can offer an on-bill loan based on bill payment histories. (The Sourcing Capital section discusses the implications of bill payment underwriting.) On-bill programs do not offer immediate positive cash flows for borrowers, but they also are generally more flexible and can fund a wide variety of equipment and improvements. On-bill financing can serve as a sales tool, in that it can serve as an endorsement that lends credibility to trade allies when discussing energy savings with their customers. On-bill financing often is less expensive than other private-market, unsecured financing products (e.g., credit cards, contractor financing, unsecured personal loans). Though it typically does not offer as low a rate as a mortgage or other secured financing, it may have no or very low fees relative to secured products. Due to its versatility but moderate cost, on-bill financing is generally offered to a general customer base. Some programs may be designed specifically to allow low credit scores to better serve a more credit-stressed population.

PAYS

As discussed in the introduction, PAYS is a tariff program. Unlike financing, where a borrower takes on a personal debt obligation, a tariff program allows a utility to make an investment at a specific meter, and recoup that investment through a tariff charged to whoever holds the account at the meter. PAYS resolves several financing barriers for this population by not requiring a credit check or minimum credit score, not burdening the resident with additional debt, and structuring the cash flow so the monthly payment should be less than monthly savings (on average). As PAYS requires a very high savings level to meet the program's target savings-to-payment ratio, analysis for Empire District territory found only replacement of working, older electric furnaces with high-efficiency heat pumps provided sufficient savings to allow administrators to fully fund retrofit projects without requiring a substantial contribution from residents. For example, in Empire District, PAYS could only fund 6% of the cost of a new air-source heat pump if the home has an older heat pump that has failed (making the baseline for determining the captured savings the lowest available efficiency heat pump on the market). If the home has an older heat pump that is still working (so that the existing equipment, which would typically have lower efficiency than any new equipment, is the baseline for measuring savings), PAYS could fund 36% of the project cost.[5] (Analysis for other districts, using different savings and costs assumptions, found that air sealing, ECM motors and heat pump water heaters could allow for full funding, depending on the baseline.)

PAYS programs currently operate in several co-ops around the country, including the Ouachita PAYS program, operated by the Ouachita Electric cooperative in Ouachita, AR, and the How$mart program, operated by the Mountain Association for Community Economic Development (MACED) on behalf of several area cooperatives in Kentucky, among others. This analysis considered the Ouachita PAYS

[5] Cadmus. *Empire District PAYS Feasibility Study.* 2018. Available online: https://mosaves.com/publications/empire-district-electric-company-pays-feasibility-study/

program, but adopted the interest rate offered in the Illinois Energy Efficiency Loan Program as more representative of what KCP&L is likely to be able to offer.

Financing Product Comparison

Table 5 presents a rating from poor to excellent for several key features across the six products. The qualitative ratings were based on an overall assessment of each product's various attributes. Appendix C presents a more complete version of this table, including more detail on how Cadmus determined each rating.

Table 5. Summary Results of Feature Comparison

Program Type	Credit Card	Unsecured Personal Loan	Home Equity Line of Credit	Property Assessed Clean Energy	On-bill Finance (non-PAYS)	PAYS
Comparison of Features						
Overall Cost	**Poor.**	**Good.**	**Okay.**	**Okay.**	**Excellent.**	**Okay.**
Monthly Affordability	**Okay.**	**Poor.**	**Excellent.**	**Excellent.**	**Good.**	**Excellent.**
Available Loan Amounts	**Okay.**	**Good.**	**Excellent.**	**Okay.**	**Excellent.**	**Poor-Okay.**
Project Eligibility	**Excellent.**	**Excellent.**	**Excellent.**	**Good.**	**Okay.**	
Ease of Use	**Excellent.**	**Poor.**	**Poor.**	**Good.**	**Okay.**	
Customer Eligibility	**Good.**	**Poor-Okay.**	**Okay.**	**Okay-Good.**	**Good.**	**Excellent.**
Outcome When Borrower Moves	Borrower remains responsible for payments.	Borrower remains responsible for payments.	Borrower remains responsible for payments.	Obligation stays with home, payment of outstanding balance may be negotiated during sale.	Borrower remains responsible for payments.	Obligation stays with home, and is paid by new resident, or owner.

As shown in Table 5, no product's key features received all good or excellent ratings, yet each product type received a rating of excellent for at least one feature. This finding is similar to Cadmus' findings for other territories in Missouri, and is likely a standard condition for most parts of the United States. Many financing products are offered by national companies (such as VISA or a major national bank), or strongly impacted by national factors such as the federal funds interest rate set by the Federal Reserve, which most lenders use as the basis for their interest rates. States do regulate some aspects of the financing market, such as licensing lenders, and rules vary from state to state. However, from the consumer perspective, differences in available financing products are modest even across state lines.

Overall cost considers the product's likely total cost over the amortization period for a $5,000 project, including estimated fees and incorporated rebate, relative to other products. The model on-bill financing program offers a low rate (5.74%) and a moderate term length, and automatically incorporates

rebates, making it likely to be the least costly choice. Despite the high interest rates, the unsecured loan has the next lowest total cost due to a short-term length and low fees.

For many borrowers, however, obtaining a manageable monthly payment is of greater concern than total cost. In this category, the HELOC, PACE and PAYS are all rated "excellent" due to their similarly long terms. The on-bill program offers low interest rates, but has a moderate term limit (up to 10 years), resulting in a slightly higher monthly payment than the three just mentioned.

To assess the available loan amounts, Cadmus considered each product minimum and maximum. The HELOC and the on-bill program offer excellent flexibility in terms of loan amounts. HELOCs allow the borrower to only borrow what they need up to a limit that is one of the highest of all the products we reviewed (PACE would offer a similar maximum amount). The on-bill product, with amounts as low as $500 and as large as $20,000, would cover most energy-related upgrades. The unsecured loan minimum and maximum amounts were not published, but may range from $500 to $15,000, based on similar products in other areas. PACE has a minimum loan amount of $2,500, above the cost of many energy-related improvements. The VISA Classic card was rated "okay" because of its low maximum credit limit of $5,000, which may not be enough to cover some major projects. While there are many credit cards that offer much higher limits, lower credit limits are not uncommon and especially may be an issue for borrowers with few options other than their credit card. PAYS was rated Poor-Okay due to its strict formula for determining available funding, which will cover the full project cost of only a handful of measures.

Private market products offer the best project eligibility, as they have no reason to limit eligible equipment or improvements based on energy savings. Of the energy-targeted program, PACE has the most lenient requirements, while the on-bill product is limited to measures eligible for a utility rebate. As noted above PAYS is limited by projected savings, and offers the least flexibility of all the products.

Credit cards offer the greatest convenience, which is consistent with the participant survey results indicating 48% of homeowners used it to pay for a home improvement project. (In about 41% of cases, a credit card purchase was treated like long-term financing and paid over time.) PACE's streamlined application process makes it a good option, while the on-bill program requires a complex application form and may take up to 60 days to be funded. PAYS requires an energy audit and severely limits eligible projects, but does offer participants extensive customized support.

In terms of customer eligibility, PAYS offers the most flexible product, relying on bill payment history rather than credit score; otherwise having virtually no requirements for the borrower. On-bill financing allows a moderately low credit score (without increasing the interest rate), making it easier for customers to receive approval. A wide array of credit cards are broadly available, including cards like the VISA Classic modeled here, which is targeted to students and borrowers with poor credit. While interest rates may increase for lower credit scores, most customers find a credit card that serves their needs. Unsecured loans have stricter credit requirements, while HELOCs and PACE require property ownership and place a lien on the property or line item on the property tax as security.

Table 6 assesses the accessibly of each product to three different market segments. The credit card proves an excellent choice for the average customer. It is extremely easy to use, and, if the balance is paid off immediately, incurs no interest charge. On the other hand, PAYS is the only choice that optimally meets the needs of credit-stressed customers and renters. PAYS helps credit-stressed borrowers by avoiding burdening them with additional debt, not requiring a minimum credit score or checking their credit, and providing a very low monthly payment in a cashflow positive structure. PAYS is the only product that helps renters overcome the split incentive barrier, making it their only truly suitable choice.

Table 6. Summary Results of Accessibility Comparison

Program Type	Credit Card	Unsecured Personal Loan	Home Equity Line of Credit	Property Assessed Clean Energy	On-bill Finance (non-PAYS)	PAYS
Accessibility by Customer Segment						
Accessibility to Customers with Good Credit	**Excellent.**	**Good.**	**Okay.**	**Okay.**	**Good.**	**Good.**
Accessibility to Credit-stressed Customers	**Okay.**	**Okay.**	**Poor.**	**Good.**	**Okay.**	**Excellent.**
Accessibility to Renters	**Okay.**	**Okay.**	**Poor.**	**Poor.**	**Poor.**	**Excellent.**

Program Requirements and Obstacles

This section discusses requirements and priorities from external stakeholders, state regulators, and corporate management that KCP&L must consider in choosing program models to include in its energy efficiency portfolio. It also examines administrative and resource requirements to implement a PAYS program as well as common program design challenges encountered and potential solutions to assess whether PAYS would make a feasible and reasonable program for KCP&L to consider.

KCP&L Energy Efficiency Implementation Needs

Since 2005, KCP&L has offered energy efficiency programs to residential customers. In an interview, KCP&L staff confirmed that the typical KCP&L energy efficiency program is designed for implementation by a third party, with minimal management required by internal staff. As required by the Missouri Energy Efficiency Investment Act (MEEIA), all programs must pass a cost-effectiveness test, except for programs targeting low-income or multifamily markets.

KCP&L generally selects programs based on their ability to deliver cost-effective energy savings at scale; so the utility meets its energy efficiency targets at the least cost to ratepayers. Programs operate on one-year implementation schedules within three-year cycles, with goals set for the three-year period. Because of the multiyear timeframe, the utility favors field-tested program models to incur the least risk possible to the portfolio's ability to achieve its goals.

For the coming year, KCP&L staff reported it will place greater priority on programs that target hard-to-reach markets that historically have not participated in existing programs in large numbers: low-income and multifamily. In these markets, upfront costs and split incentives present significant energy efficiency uptake barriers that are not fully overcome by traditional program models. In addition to helping the utility meet its obligation to serve all customers, these markets present significant savings opportunities due to their low participation rates to date.

KCP&L staff expect that programs targeting hard-to-reach markets will present challenges that the utility has not faced with its more mainstream programs. For example, staff expect pilot programs specifically targeting these harder-to-reach markets to require a dedicated internal staff to identify opportunities, coordinate pilot implementation, and provide customer support. To meet this need, KCP&L expects to add at least one full-time employee to support the development and implementation of new programs as well as to provide greater internal customer support for customers in these target markets.

Another issue may be achieving scale; staff expect to pilot multiple new program models, and then focus on scaling up pilots that show potential for increased participation. Under MEEIA rules, the utility need only provide provisional cost-effectiveness targets for these pilot programs.[6] However, the utility will have to meet its overall energy efficiency savings goals in a cost-effective manner, and must be mindful

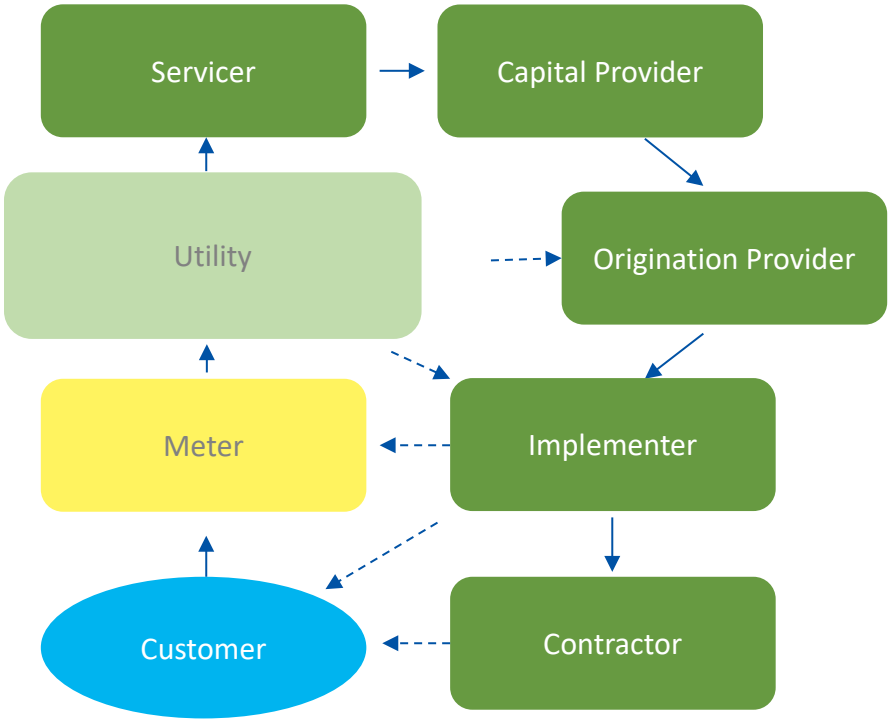
[6] Missouri Code of State Regulations, 4 CSR 240-20.094 4G

of diverting too much budget and staff attention to programs that cannot serve a meaningful number of customers.

PAYS Program Organization

Although a trademarked concept, in practice, PAYS programs are typically customized to a program administrator's needs, as long as it includes the basic features (e.g., the energy audit, capped monthly tariff, no credit score requirement). Most PAYS programs conform to a common organizational structure, as shown in Figure 21.

Figure 21. PAYS Program Design



For a typical PAYS program, basic program requirements include the roles played by utility and key partners; these are similar in a traditional IOU-administered on-bill program. For either program, the necessary partners and the exact role of each of these depend on the organizations involved, the program's size, the regulatory context, and, finally, the program administrator's preference. In some PAYS programs, for example, a single entity can play multiple roles, such as the capital provider and servicer being the utility itself. Green boxes indicate a program administrator or partner. The solid arrows in Figure 21 indicate a flow of funds, while dotted arrows indicate a relationship.

Some on-bill programs use one or more specialized service providers to handle the roles of origination, implementation, and servicing, while many PAYS programs, implemented by cooperatives or municipal utilities, assign those roles internally.

Servicer

Servicing includes tracking monthly payments against the total amount due over the tariff's duration. The utility may remit payments from participants directly to the servicer or may remit payments based on servicer reports to the capital provider.

Capital Provider

Capital providers are usually lenders or brokers that work with outside investors to procure project funding or loan capital (depending on the program type). While a utility may operate a tariff or financing program using internal resources and capital, most IOUs choose to partner with organizations that specialize in this function. The origination provider may serve as a liaison with a capital provider.

Utility

As the program administrator, the utility provides general oversight, direction and management for all parties involved in the program. In addition, utilities typically assume the following tasks:

- Provide data and contact information for customers in target market segments to facilitate outreach
- Provide billing and other data to support audits and program evaluation
- Collect tariff payments on utility bills, and remit them to the servicer or the capital provider
- Ongoing engagement with tariff owner about program and progress

The utility may retain responsibility for long-term functions of the equipment or upgrades installed, depending on the structure of the agreement made with the customer. Similarly, the utility may retain responsibility for collections, or, depending on the agreement with the capital provider and the servicer, outsource that task to the servicer.

Origination Provider

Origination consists of the following tasks:

- Managing available capital
- Reviewing funding applications
- Ensuring projects meet program requirements
- Releasing funds to contractors

Origination providers also may source capital. Ameren Missouri staff reported that origination providers they consulted charged discovery and management fees for this service.

Implementer

Implementation includes outreach to participants, overseeing audit services and installation, performing quality control, and ensuring projects meet program guidelines. The interviewed PAYS implementer reported that this organization typically performed all day-to-day, "on the ground" operation of the program, including outreach, ongoing customer communication and support through completion of the project, coordinating audits and installations, and performing quality control checks.

Contractor

Some administrators use a network of subcontractors to perform audits and complete upgrades. In other programs, the implementer does some aspects of this work internally, while utility staff provide quality control. Typically, the contractor is responsible for only installing the equipment, including any equipment failures during its lifetime that results from improper installations.

Key Design Challenges

No investor-owned utilities (IOUs) currently implement PAYS. One reason for this is that the PAYS program's design presents several challenges particularly difficult for regulated utilities to overcome. IOUs, as regulated entities, face strict requirements for protecting ratepayers from unnecessary expenses. At the same time, for a program to succeed, the IOU must be able to find a low-cost capital source to fund the program. Navigating between these opposing mandates has challenged other Missouri IOUs considering PAYS.

Sourcing Capital

PAYS administrators must be able to pay upfront costs for PAYS projects, and requires significant capital to do so. As discussed, a program administrator (such as a cooperative utility) may use its own capital reserves to fund the program. Still, to avoid accounting irregularities and ensure the proper flow of funds, it is unlikely an IOU would use its own corporate capital to fund a PAYS program. Instead, an IOU must procure capital, the cost of which will be charged to the IOU as interest. While the PAYS model does not expressly prohibit charging a high interest rate, tariff requirements to fund only amounts that can be recovered through a charge capped at 80% of expected monthly savings limits the total amount of funding the program can provide. The higher the interest rate, the less funding becomes available to cover the measure's cost.

PAYS presents two key obstacles to obtaining low-cost capital:

- It usually targets lower-income and renter populations.[7] These population segments often have lower credit scores, which most investor interpret as a higher default risk (or nonpayment risk, in the case of a tariff) than the general population. Normally, investors would use credit scores to screen out individuals considered less creditworthy.
- PAYS prohibits requiring credit checks or a minimum credit scores. Most private sector investors have very little appetite for alternative screening methods, such as the bill payment history used by most PAYS programs, despite that most PAYS programs—like most energy efficiency financing programs—offer nonpayment rates below 2%.[8] Other PAYS administrators resolve this

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7 Clean Energy Works. *PAYS harnesses a proven utility investment model to offer virtually all consumers cost-effective building upgrades.* Blog, available online: http://cleanenergyworks.org/blog/pays-financing/

8 State and Local Energy Efficiency Action Network. *Energy Efficiency Financing for Low- and Moderate-Income Households: Current State of the Market, Issues, and Opportunities*. 2017. Available online: https://www4.eere.energy.gov/seeaction/system/files/documents/LMI-final0914.pdf

by not sourcing capital from the private market. Cooperatives are eligible for federal grants as a project funding source, or cooperatives can use their own capital reserves, as does the Ouachita program.[9]

The Illinois Energy Efficiency Loan Program (EELP) serves as an example of an IOU-administered financing program using private-sector capital. This program uses credit score underwriting rather than bill payment histories. In addition, the IOUs provide a credit enhancement to reduce interest charged by investors. A credit enhancement is any policy or program feature that provides enhanced protection from default risk or nonpayment. Credit enhancements can take many forms, but may include payment guarantees, loss reserve funds, and service shutoffs for nonpayment.

For the Illinois EELP, the IOUs were required by law to make all scheduled payments to the capital provider, regardless of what participants paid. The payment guarantee to investors from the utilities ensured investors faced no more risk than they would if lending to the utilities themselves. Accordingly, investors reduced the cost of capital to the IOUs' own corporate borrowing rate (currently about 5%), allowing the utilities to charge a below-market interest rate.

Additionally, the Illinois Commerce Commission, which regulates the IOUs, approved a provision that allowed the utilities to recover EELP nonpayments from ratepayers, protecting shareholders from risk. To protect ratepayers, the Illinois program tariff allowed utilities to disconnect service for nonpayment of the tariff, in addition to their standard collections procedures. Early evaluation results from the EELP showed a very low nonpayment rate at 0.16%—well below the 2% nonpayment rate typical of energy efficiency financing programs.[10,11]

The low nonpayment rate expected from energy efficiency financing and tariff programs allows for another common credit enhancement, known as a loss reserve: a pool of funds held in reserve to cover loss due to nonpayment after other collection methods fail. Research for other PAYS feasibility studies has found several PAYS administrators, including the MACED program in Kentucky, use loss reserves to fully protect ratepayers from participant nonpayment. Loss reserve funds typically are set equal to a certain percentage of the program's outstanding loan volume, just above the expected nonpayment

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9 Ouachita Electric Cooperative, Eetility, Clean Energy Works. *Performance of Inclusive Financing for Energy Efficiency: Preliminary Results of the Ouachita Electric HELP PAYS Program*. September 2016. Available online: http://www.oecc.com/pdfs/Ouachita%20Electric%20HELP%20PAYS%20Program%20-%20First%204%20Months%20of%20Activity.pdf

10 Cadmus. *Illinois On-Bill Financing Program Evaluation*. Prepared on behalf of the Illinois Energy Association. 2015. Available online: https://www.icc.illinois.gov/docket/files.aspx?no=11-0689&docId=230270

11 State and Local Energy Efficiency Action Network. *Energy Efficiency Financing for Low - and Moderate-Income Households: Current State of the Market, Issues, and Opportunities*. 2017. Available online: https://www4.eere.energy.gov/seeaction/system/files/documents/LMI-final0914.pdf

rate. This limits the funding amount needed in reserve, but protects the administrator (and ratepayers) from absorbing the cost of unrecovered investments.

Money in a loss reserve fund can come from any source. The MACED PAYS program charges a one-time 5% fee to participants, accumulating a loss reserve fund equal to 5% of the outstanding investment volume, above the expected nonpayment rate. In theory, a utility could source funds through its energy efficiency program budget, but the MACED approach further removes ratepayers from financial burdens associated with the program.

In addition to credit enhancements, the PAYS design incorporates features intended to limit nonpayment. For example, PAYS emphasizes a tariff structure rather than a loan, which in many cases allows the utility to shut off service if the participant does not pay the tariff. In addition, the tariff is structured so the participant's monthly bill, including the tariff, should be lower on average than before the project was installed (and therefore easier for the participant to pay).

Finally, while the program does not consider credit scores, program administrators usually require that participants be current on their utility bills. Cadmus did not identify any IOUs in the United States that operate residential financing or tariff programs based on bill payment histories. However, Manitoba Hydro, a province-wide utility in Canada, has a long-standing financing program for HVAC upgrades that uses bill payment histories, has a 0.4% nonpayment rate, and has one of the highest participation rates of any financing program in North America.[12]

Regulatory Considerations

Cooperatives and municipal utilities, which are not regulated and do not answer to shareholders, have greater leeway for accepting financial risk to ratepayers through an energy efficiency program used by only a minority of customers. IOUs face much tougher restrictions on types of financial risk they can incur. Neither a loss reserve nor allowing for shut-off for nonpayment can guarantee that ratepayers avoid bearing any nonpayment burden from a participant. In addition, regulators may consider funding a loss reserve or allowing a shut-off may place unusual or undue burdens on PAYS participants. Ultimately, an IOU interested in offering a PAYS program will need to address these concerns with its regulator and obtain regulatory approval for the final program design.

Estimated Start-up and Implementation Requirements

Through secondary research conducted for this and other PAYS feasibility studies in Missouri, Cadmus estimated administrative costs for KCP&L to offer a PAYS program. Requirements described in this section represent the experience from several ongoing PAYS program operated by cooperatives in North Carolina, Kentucky, and Arkansas as well as the experiences of Ameren Missouri and Empire District as they have explored possible on-bill programs.

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[12] Cadmus. *California Joint Utilities Financing Research: Existing Program Review*. 2014. Available online: http://www.calmac.org/publications/Existing_Programs_Review_FINAL.pdf

Estimated costs include start-up and implementation costs directly attributable to the program and recoverable through the MEEIA rules. Some costs, such as staff time to coordinate design and manage the regulatory approval process, and upgrades to billing systems to communicate with an outside servicer or to manage servicing internally, would be additional to these costs. Upgrades to IT systems that manage billing may be a significant cost – in the low hundreds of thousands as a base estimate – which the utility would need to recover through its regular rate making process, which could take several years. Although not recoverable as a cost to implement PAYS under MEEIA rules, this cost may present a barrier to a utility such as KCP&L considering offering a tariff or on-bill financing program.

Start-Up

Starting up a PAYS or another on-bill financing program will likely require support from an outside design consultant. For PAYS, only a few firms are allowed to provide customized designs of the trademarked program, but these companies are not expected to charge above typical market rates. In research for other PAYS studies, administrators reported receiving proposals for PAYS design services that would include facilitating discussions of program design elements with stakeholders and regulators, priced between $40,000 and $50,000 (shown in Table 7). In addition to financial costs, the process to design and launch a PAYS or another on-bill program may require more time than a typical rebate program to navigate regulatory hurdles and to identify outside partners.

Table 7. Start-up Costs for PAYS

Cost	Value	Source
PAYS program design and licensing	$50,000	Cadmus unpublished research (cost proposal from a PAYS implementer)

Annual Implementation

Annual implementation costs for PAYS would include marketing and outreach, customer support, project implementation, and quality control, as with a traditional rebate program. In addition, a PAYS program would also need to handle review of funding applications and issuing funds to pay contractors (origination). As standard practice for energy efficiency programs, Cadmus assumed the program budget would include staff time for managing the program, marketing and outreach for the program, and program evaluation, in addition to covering implementers' costs. Following the MACED example, participants are expected to fund a loss reserve and pay interest on project capital. As participants will repay funds initially spent on project implementation, the implementation budget does not include that amount. Table 8 shows an estimated program budget for one year of PAYS implementation.

Table 8. Estimated KCP&L Costs for Annual PAYS Implementation

Category	Estimated Cost	Source
Utility Administration (program staff)	$80,000	Assumed, estimate for 1 FTE
Implementation	$700 to $1,000 per participant	Cadmus unpublished research (cost proposal from a PAYS implementer, as reported by a PAYS administrator)
Marketing and outreach	$25,000	Average cost reported by Illinois EELP IOUs
Evaluation	$24,000	Assuming 3% of program implementation costs, not including project funding

Servicing (10-year term)	$900 per participant	Cadmus unpublished research (cost proposal from a potential servicer)
Origination	$600 per participant per year for each year of tariff duration	Cadmus unpublished research (cost proposal from a potential originator)
Call Center	$61	Average cost reported by Illinois EELP IOUs
Estimated total, assuming 250 participants	**$785,250**	

Although KCP&L would front project funds, estimated at $1,375,00 for 250 participants, project funds and interest ultimately would be paid by participants. Cadmus also assumed nonpayment would be covered by the loss reserve, itself funded by participants. Table 9 summarizes estimated participant costs.

Table 9. Estimated Costs Paid by Participants

Category	Estimated Cost	Source
Project funding	$1,375,000 (Assumes $500 to $7,500 per project, $5,500 on average)	Ouachita PAYS evaluation, 2018
Interest on Project Funding	5.0% annually on outstanding balance	Assumed
Loss Reserve	$68,750	Assumed. Amount to be paid by participants as a fee rolled into financed amount

Though costs noted in this section are estimates based on the best available information, they should be verified (for example, by soliciting bids for services). Nevertheless, the total program budget presented here, including program and participant contributions, falls within the range for on-bill financing ($1.4 to $15 million per year) identified by KCP&L stakeholders when considering program options for the 2017 and 2018 program years.[13]

Scale and Impact Considerations

KCP&L staff noted a key consideration in deciding whether to scale up a pilot program would be the program's potential to serve a meaningful number of participants. According to staff, the utility does not have a specific minimum threshold for expected participation; rather, the programs showing the most promise for generating savings across the broadest number of customers are the ones staff select for the program portfolio. Given that a low-income program would not have to meet cost-effectiveness requirements and serving this market is one of KCP&L goals, staff might select a low-income program even if it was forecast to have lower participation than a program with comparable savings per participant that was not income-qualified. Staff indicated that most programs offered without an income-eligibility requirement are expected to serve at least several hundred customers annually.

[13] KCP&L. MEEIA 2017–2018 collaborative Program Review— KCP&L Findings [Memorandum]. Provided to Cadmus by KCP&L.

Potential Participation

In research conducted outside this study, Cadmus found that PAYS annual participation numbers have ranged from an average of 58 (Kentucky) to 198 (Ouachita, Arkansas) in the co-operative and municipal territories where it has been implemented. Several programs, in existence for several years, show consistent annual participation rates. Table 10 summarizes participation in various PAYS programs around the country.

Table 10. Participation in PAYS Programs[a]

Program	Total Participation To-Date	Years
Home Energy Loan Program (HELP) PAYS (Ouachita Electric Cooperative, Arkansas)[b]	198	2016–2017
Upgrade to $ave Program (Roanoke Electric Cooperative, NC)	400+	2014–2017
Help My House Pilot (Electric Cooperatives of South Carolina)[c]	125	2011–2012
How$mart KY PAYS (MACED)	289	2011–2017
City of Windsor PAYS (water measures only, City of Windsor, CA)[d]	641 (62% multifamily)	2012–2017
Green Hayward PAYS (water and energy measures, City of Hayward, CA) [d]	162 (100% multifamily)	2014–2018
East Bay Municipal Utility District (water measures only, California) [d]	89 (100% multifamily	2016–2018
Average Annual Participation	**102**	**n/a**

[a]Except where otherwise noted, all data from Cadmus' unpublished research.

[b] Ouachita HELP PAYS Residential Energy Efficiency Program Evaluation: https://mplscleanenergypartnership.org/wp-content/uploads/2018/04/Ouachita_PAYS_Report.pdf

[c]Help My House Pilot Program Final Summary Report: https://www.eesi.org/files/HelpMyHouseFinalSummaryReport_June2013.pdf

[d] Draft Study Plan for the BayRen Water Bill Savings Process Evaluation: https://pda.energydataweb.com/api/view/2033/Draft%20Water%20Bill%20Savings%20Study%20Plan_2018_03_30.pdf

Except for the California programs, which are offered by municipal water utilities, Cadmus found little data on numbers of low-income or renter participants (which would make up a majority of multifamily participants). Multifamily participation varied widely by program. The California programs had a majority of multifamily participants, while South Carolina's Help My House pilot excluded multifamily homes. The Ouachita program allowed single-family and multifamily customers to participate. An early evaluation reported that 62 of the first 131 projects (47%) were completed in multifamily units, all of which were occupied by renters.[14]

In interviews conducted for the Ameren Missouri PAYS feasibility study, a PAYS implementer reported that, in most cooperative PAYS programs in the Midwest and South, the majority of participants were single-family home owners. According to the implementer, this is partly due to fewer multifamily homes in rural areas served by most programs, and the administrators' desire to keep programs simple.

[14] Ouachita Electric Cooperative, Eetility, Clean Energy Works. *Performance of Inclusive Financing for Energy Efficiency: Preliminary Results of the Ouachita Electric HELP PAYS Program*. September 2016. Available online: http://www.oecc.com/pdfs/Ouachita%20Electric%20HELP%20PAYS%20Program%20-%20First%204%20Months%20of%20Activity.pdf

KCP&L, which has approximately 540,000 Missouri residential customers, covers a larger territory than most of the programs shown in Table 10; therefore, a program could potentially achieve higher participation levels. (The Ouachita Electric Cooperative, for example, had only 9,500 customers.) Based on demographic data from the customer survey, KCP&L has a significant number of customers that could be categorized as low-income, renters, or multifamily residents, and should be able to achieve higher-than-average participation levels, even from a program limited to a particular segment of the residential market.

At the same time, analysis for Ameren Missouri and Empire District found that PAYS, if limited to projects offering sufficient savings for the program to fund full project costs, potentially could be cost-effective with fewer than 300 participants. This threshold is low enough to reasonably expect KCP&L would not need to limit the program to low-income or multifamily customers due to concerns that the program would not be cost-effective. A third-party evaluation found that Ouachita's PAYS program became cost-effective with 198 participants.[15]

Project Requirements

PAYS' structure is designed to ensure that the project and tariff do not present economic hardships to participants, limiting the tariff amount to 80% of expected average monthly savings, and the duration of the tariff to 80% of the expected useful life of the upgrade. Analysis for other Missouri IOUs found only a few measures had sufficiently high savings relative to cost to allow for full or nearly full funding through a PAYS program. For example, a hypothetical $5,000 project, assuming 5% interest and a one-time 5% fee, would need to save around 7,500 kWh a year over the baseline scenario for about 14 years for a PAYS administrator to be able to fund the full cost and recover that funding through the PAYS tariff. Studies for Ameren Missouri and Empire District found only a few major energy projects provided sufficient savings to allow full funding under PAYS. Measures that would allow for full PAYS funding varied by study, but typically included replacements of working electric heating equipment (particularly electric furnaces) with a high-efficiency heat pump, air ceiling, ECM motors, and heat pump water heaters.[16] (As noted in the Demographics section, about 29% of single family meters are in a rate class that indicates electric space heating. By homeownership, 28% of homeowners and 54% of renters live in a home that has electric space heat).

PAYS does not require that the program funds full upfront costs. Some programs, such as the Ouachita program, allow participants to pay some initial costs as a "co-payment" to limit the program-funded amount to that which can be recovered under the program guidelines. The early report from the Ouachita PAYS program reported that 21 of 69 single-family projects required a copay, averaging

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[15] OptiMiser LLC. Ouachita HELP PAYS® Residential Energy Efficiency Program Evaluation. Prepared for Ouachita Electric Cooperative, February, 2018. Available online: https://mplscleanenergypartnership.org/wp-content/uploads/2018/04/Ouachita_PAYS_Report.pdf

[16] The fact that the equipment works allows the utility to consider the savings differential between existing equipment and new equipment; for projects replacing failed equipment, savings must be based on the differential between new equipment installed and likely equipment installed if the program did not exist.

$1,158. Twelve of 62 multifamily projects required the landlord to complete initial repairs not covered by the program to prepare units for PAYS-funded projects.

Conclusions and Recommendations

Conclusion 1. Opportunity exists for a utility-sponsored financing program to fill a gap in the financing market and increase residential uptake of energy efficiency improvements.
Homeowners frequently use financing, and in some cases depend on it, to manage high first cost barriers to home improvement projects including energy efficiency upgrades. A third of homeowners (33%) reported using some kind of long-term financing to fund a home improvement purchase; of those, 61% said they could not have paid in cash. Homeowners using financing were more likely than those using cash to report not having financing would have caused them to delay, downgrade, or not complete their project.

Renters demonstrated even greater dependence on alternatives to paying cash: six of eight renters relied on someone else to pay for their projects, borrowed money from an acquaintance, or used financing. All of these would have delayed, downgraded, or failed to complete their project if the payment method they used was not available. Supporting this finding, renters indicated especially high levels of concern related to payment and financing barriers, if they were faced with a sudden $5,000 expense. Over 50% of renter respondents rated almost all financing-related concerns to be significant or very significant.

Though the study found most customers' financing needs were already being met, some segments of the market do not have easily accessible, affordable financing options. The financing gap analysis found none of the existing financing products analyzed, including PACE, were optimal for credit-stressed borrowers or renters.

A PAYS program could potentially overcome financing barriers of credit-stressed borrowers and renters if it provided an affordable interest rate and an easy (or well-supported) participation process, and it used bill payment histories rather than credit score underwriting.

Conclusion 2. While a significant number of customers accepted the PAYS offer, survey responses indicated a significant information barrier for many customers when evaluating this unique program.
Though homeowner uptake of the PAYS offers was lower than the uptake of the rebate-only offer, a majority of respondents indicated they would accept a utility tariff, regardless of whether the homeowner was replacing failed equipment, replacing working equipment, or contributing a copayment. However, among those rejecting the utility offers, respondent comments indicated possible confusion about financial terms of the offer. For example, one-third of those rejecting the offer to replace working equipment said they did so simply because they would never replace equipment that still worked, despite the fact that the upgrade would present no net cost.

On the renter side, a significant number of renters rejected the program offer due to the split incentive barrier. As the expense of the project increased, the number of renters choosing to participate decreased from 58% to 42%, even though the net cashflow to participants actually improved slightly. The survey format limited Cadmus' ability to explain the program's parameters, and respondents had little incentive to invest in understanding them. Nevertheless, any program offering a product similar to

PAYS would likely face communication barriers more difficult to overcome than those faced by relatively straightforward rebate programs.

Conclusion 3. KCP&L's customer base appears to include a large number of homes that would benefit from PAYS.
Customers responses indicate about 10% of homeowners and about 50% of renters use an electric furnace, equipment Cadmus found in previous studies to be the most likely project to provide sufficient savings to allow for full funding under PAYS guidelines, especially if replaced while the older equipment is still operable. The survey also found 23% of homeowners and 56% of renters had annual incomes below $50,000, which may qualify them as low-income. In addition, data from the U. S. Census Bureau indicate about 35% of KCP&L households rent. For both low-income households and renters (two groups that have significant overlap), the financing gap analysis identified PAYS as the optimal financing tool. Renters, facing the split-incentive not addressed by most available financing products, could be especially good candidates for PAYS. While these initial findings appear promising, more in-depth market research would be required to understand the potential for energy savings and the potential need for PAYS in KCP&L's territory.

Conclusion 4. The primary PAYS barrier for KCP&L will be obtaining regulatory approval for appropriate credit enhancements to attract investors willing to provide low-cost capital.
Based on estimated costs and resource requirements, PAYS is administratively feasible for KCP&L. PAYS' unique features, including targeting populations with greater credit risk, and prohibiting credit score underwriting, may present difficulties in obtaining capital to fund the program. At the same time, credit enhancements that may help overcome some investor hesitation may be viewed by regulators as placing undue risks on ratepayers. Finding a program design that balances these competing priorities will likely be the most difficult obstacle to successfully offering PAYS.

Recommendation 1. KCP&L should consider a potential PAYS or similar program, but it should target the program carefully to a specific market segment to ensure it meets customers' needs.
Due to its strict requirements for eligible projects, PAYS will prove unattractive to customers with access to other financing options. Targeting the program to low-income or multifamily populations meets KCP&L objectives for better serving hard-to-reach markets and optimizes the benefits of a PAYS program. The financing needs of low-income homeowners, however, are different from those of renters, as are the needs of those living in single-family homes versus those in multifamily units. KCP&L should conduct analyses to identify the market with the best opportunity to achieve high savings, and consult with financing program experts to design a program that best serves that market. If KCP&L pursues a program targeting the multi-family sector, it should also conduct in-depth interviews or surveys with property owners. It will be important for the program to recognize the needs and potential concerns of this stakeholder group, and there may be potential for property owners to serve as an effective delivery channel for a PAYS program.

Recommendation 2. As early as possible in the development process, KCP&L should address the two primary barriers to successfully offering a PAYS or on-bill program: designing credit enhancements that satisfy regulators and attracting low-cost capital from investors.

KCP&L should work with PAYS experts and other energy efficiency financing experts who may be more knowledgeable about the needs of IOUs and regulators to understand their options with regard to credit enhancements and securing capital. KCP&L should anticipate the need to work closely with regulators and other stakeholders to design the program, and should expect the process required to resolve these barriers will be longer than the typical efficiency program planning process.

Appendix A. Customer Survey Questions

KCP&L Pay-As-You-Save Feasibility Study
Customer Survey Instrument

As part of a feasibility study of an KCP&L Pay-As-You-Save (PAYS) on-bill financing program, KCP&L will conduct an online survey of its residential utility customers in Missouri. This survey instrument will be programmed and fielded by KCP&L's staff, and the data delivered to Cadmus for analysis.

Question Overview

Researchable Questions	Question Number
Customer familiarity and preferences for different types of financing	C2, D5, D7 - D9, D11
Need for and access to financing for home improvements	C1, C2, D5, D6, D11
Customer barriers to uptake of major energy improvements (and to what degree financing is a barrier)	A10, C3, C4, D10
Acceptance of tariff, and willingness to move into a residence with efficiency improvements and a tariff	B1 - B11
Willingness to accept co-payment for certain measures	B7
Customer demographics (income, rent/own, education, saturation of efficient lighting and appliances)	Section E, Section F

Target: Minimum 200 responses across KCP&L territory
Homeowners: 130
Renters: 70

Programming language in red; this text will not appear on screen.

GENERAL INSTRUCTIONS

- Include a progress bar if possible
- Headers and question numbers should not appear on screen
- Assume all questions are single-response, unless otherwise indicated
- Do not force response unless indicated
- For randomized response options, maintain "None", "Other" and "Not sure" positions at the end of list

Survey Welcome Screen (Suggested)

KCP&L would like to better understand how its customers plan and pay for major home energy efficiency upgrades. Your input is greatly appreciated and will be kept completely confidential.

If you have any general questions about this survey, please contact:

Brian File
Brian.File@KCPL.com

Screeners

[Force response for all Sect. A survey questions]

A1. Please click on the button that describes you.

1. I receive electricity service from KCP&L
2. I receive electricity service from some other company [SKIP TO EARLY TERMINATION]
3. I don't know who my electricity provider is [SKIP TO EARLY TERMINATION]

A2. What is your age?

1. Under 20 years [SKIP TO EARLY TERMINATION]
2. 20 years to 34 years
3. 35 years to 49 years
4. 50 years to 64 years
5. 65 years or over

A3. Which of the following best describes your living situation?

1. You own your home outright (no mortgage)
2. You have a mortgage, and you are wholly or partially responsible for paying the mortgage
3. You rent your home, and you are wholly or partially responsible for paying the rent [SKIP TO A7]
4. You neither own your home nor are wholly or partially responsible for any rent payments [SKIP TO EARLY TERMINATION]

98. Don't know [SKIP TO EARLY TERMINATION]

Homeowners

A4. [IF A3=1,2] Are you responsible for, or do you have shared responsibility for, paying the electricity bill in your household?

1. Yes
2. No [SKIP TO EARLY TERMINATION]

98. Don't know [SKIP TO EARLY TERMINATION]

A5. [IF A3=1,2] Are you responsible for, or do you have shared responsibility for, decisions related to major upgrades or improvements to your home?

1. Yes
2. No [SKIP TO EARLY TERMINATION]

A6. [IF A3 =1,2] Have you recently completed, or are you interested in completing, any of the following projects in your home (without considering the cost of these upgrades)? [Randomize list; force response in each row]

Item Code	Item	I have purchased this within the last 12 months	I plan to purchase this in the next 12 months	I am interested, but do not plan to purchase in next 12 months	Not interested
		1	2	3	4
A	New central heating and/or central cooling equipment				
B	New water heater				
C	New major household appliance (such as a washer, dryer, or dishwasher)				
D	Weatherization (such as insulation or air-sealing)				
E	New windows				

Renters

A7. [IF A3= 3] Do you pay your electric bill directly?

1. Yes
2. No, it is included in my rent [SKIP TO EARLY TERMINATION]
3. No, it is paid another way [SKIP TO EARLY TERMINATION]

98. Don't know [SKIP TO EARLY TERMINATION]

A8. [IF A3= 3] Have any of the following upgrades recently been installed in your home, or do you feel that you would benefit from having them installed in your home? (For this question, don't worry about the cost, the landlord's willingness to install the item, or the potential impact on your rent.) [Randomize list; allow only one selection per row]

Item Code	Item	This was installed in my home within the last 12 months	I would benefit from this improvement	I would not benefit much from this improvement
		1	2	3
A	New central heating and/or cooling equipment			
B	New water heater			
C	New major household appliance (such as a washer, dryer, or dishwasher)			
D	Weatherization (such as insulation or air-sealing)			
E	New windows			

A9. [IF A8= **1]** Which, if any, of the following items you indicated were recently installed in your home did you pay for yourself?

1. [LIST EACH ITEM]
2. None

98. Don't know

A10. [IF A6 OR A8 A-F = 1] Please indicate if any of the items you purchased were certified by ENERGY STAR? If so, the item will have the blue ENERGY STAR sticker. [Show picture of ENERGY STAR logo.]

1. Yes
2. No

98. Don't know

B. *Willingness to Accept Tariff*

Like many utilities, KCP&L offers several programs to help customers save energy and lower their bills. This section describes a series of scenarios where you must make a decision about how to pay for improvements to your home, and whether or not to participate in a hypothetical program offered by KCP&L.

For each scenario, please only consider the information provided, and assume that your home has the same characteristics as the one in the scenario. We understand your options may be different in real life, but we would like to understand how you would react if you were in the situations described.

[ASK B1 - B6 IF A3 =1, 2 (Homeowner)]

B1. First, imagine your central heating and/or cooling system breaks and you need to replace it immediately. A standard-efficiency system will cost about $4,500. If you buy a high-efficiency system instead, at a cost of about $5,000, your utility will offer you a rebate of $100. The high-efficiency system would save you about $50 per year on energy costs **compared to a new standard- efficiency system** and has additional features such as quieter operation.

	Option A	Option B	Option C
	Utility Offer	High Efficiency Upgrade, No Utility Assistance	Regular System
Value of improvements	$5,000	$5,000	$4,500
Utility rebate	$100	--	--
Your upfront cost	$4,900	$5,000	$4,500
Annual bill savings (relative to regular efficiency system)	$50	$50	--

Which option are you most likely to choose?

1. Option A – High-efficiency system, with the rebate
2. Option B – High-efficiency system, with no utility assistance
3. Option C – Regular efficiency system
4. None of the above. I would delay the purchase or purchase something cheaper (like a space heater or window AC).

98. I'm not sure

B2. [IF B1=2,3,4,98] Can you tell us more about why you would not choose the utility rebate? [OPEN ENDED]

B3. Now, again imagine your heating and cooling system has failed and you need to replace it. In addition to the rebate, imagine your utility offers a program to finance the remainder of the cost. The program works like this:

- The utility would provide $100 to the contractor as a rebate, and finance $4,900.
- You would pay $0 up front.
- The financing requires no credit check, only that you are current on your electric bill.
- You would repay the loan as an extra $40 charge each month on your electric bill ($480 per year) for about 14 years.

The high-efficiency system would save you about $50 per year on energy costs **compared to a new regular efficiency system** and has additional features, such as quieter operation.

	Option A	Option B	Option C
	Utility Offer	High Efficiency Upgrade, No Utility Assistance	Regular System
Value of Improvements	$5,000	$5,000	$4,500
Utility rebate	$100	--	--
Utility financing	$4,900	--	--
Upfront cost	$0	$5,000	$4,500
Annual payments	$480	--	--
Annual bill savings (relative to a regular efficiency system)	$50	$50	--

Which option are you most likely to choose?

1. Option A – Utility offer for rebate and financing for high efficiency system
2. Option B – High-efficiency system, with no utility assistance
3. Option C – Regular system
4. None of the above. I would delay the purchase or purchase something cheaper (like a space heater or window AC)

98. I'm not sure

B4. [IF B3=2,3,98] Can you tell us more about why you would not choose the utility offer? [OPEN ENDED]

B5. This time, imagine your utility offers a $100 rebate plus full financing for a new high-efficiency system to **replace your working heating and cooling equipment**. Assume your heating and cooling system is at least 8 years old and not very efficient. The utility is offering this program to help you upgrade to higher-efficiency equipment, so you use less energy and have lower bills.

The program works the same way as in the previous scenario:

1. The utility would provide $100 to the contractor as a rebate, and finance $4,900.
2. You would pay $0 up front.
3. The financing requires no credit check, only that you are current on your electric bill.
4. You would repay the loan as an extra $40 charge each month on your electric bill ($480 per year) for about 14 years.

You would save about $54 per month, or $650 per year in utility bills **compared to your current inefficient system**, for a net savings of $170 per year off your utility bill. The new system also heats and cools more evenly, and operates more quietly. Note that you will save more off your bills in this scenario, because most older equipment, like the 8 year old system mentioned here, is less efficient than even the standard efficiency models available for sale now.

	Option A	Option B
	Utility Offer	No improvements
Value of Improvements	$5,000	--
Utility rebate	$100	--
Utility financing	$4,900	--
Upfront cost	$0	--
Annual payments	$480	--
Annual bill savings relative to existing heating and cooling system	$650	--
Annual net savings	$170	--

Which option are you most likely to choose?

1. Option A – Utility offer to fully finance a new high-efficiency system
2. Option B – No improvements, keep current system

98. I'm not sure

B6. [B5=2,98] Can you tell us more about why you would not choose the utility offer? [OPEN ENDED]

B7. In this last scenario, assume again that the utility offers to replace your **working but inefficient heating and cooling equipment** with a higher efficiency system. This time, they offer the $100 rebate and to finance $3,900, but ask that you pay $1,000.
The project would again save you about $54 a month in utility bill charges, or $650 per year **compared to your current system**. Your monthly payment would be reduced to $32, or $384 per year. The net impact on your utility bill would be $266 in savings per year.

	Option A	Option B
	Utility Offer	No improvements
Value of Improvements	$5,000	--
Utility rebate	$100	--
Utility financing	$3,900	--
Upfront cost	$1,000	--
Annual payments	$384	--
Annual bill savings	$650	--
Net bill savings	$266	--

Which option are you most likely to choose?

1. Option A – Utility offer to partially finance a new high-efficiency system
2. Option B – No improvements, keep current system

98. I'm not sure

B8. [IF B7=2,98] Can you tell us more about why you would not participate in this offer? [OPEN ENDED]

[ASK IF A2=2, Renter]

B9. First, imagine your utility offers a program through which they will make improvements to your home that save energy and make your home more comfortable, such as air-sealing and attic insulation. The utility provides a custom home energy audit that determines the improvements will save you $240 a year on energy bills, in addition to making the home more comfortable. The program works like this:

- The utility will pay the upfront cost of these improvements, about $1,500.
- You would pay an extra charge of $15 per month on your bill ($180 a year) until the cost of the improvements is repaid **or until you move out**.

Your landlord tells you they have agreed to the improvements.

	Option A	Option B
	Utility Offer	No improvements
Value of Improvements	$1,500	--
Utility pays	$1,500	--
Your upfront cost	$0	--
Your annual payments	$180	--
Your annual bill savings	$240	--
Your net savings per year	$60	--

Which option are you most likely to choose?

1. Option A – Utility-financed improvements
2. Option B – No improvements

98. I'm not sure

B10. [IF 0=2,98] Can you tell us more about why you would not participate in this offer? [OPEN ENDED]

B11. Now, suppose your home has very high energy costs. Your utility offers to include a new heating and cooling system in addition to the other improvements, for a total value of $7,500. The improvements would reduce your energy costs by $1,200 a year, and you would have an extra charge on your utility bill of $80 a month ($960 a year) for about 10 years. Again, you are not responsible for any remaining payments if you leave the rental before 10 years.

	Option A	Option B
	Utility Offer	No improvements
Value of Improvements	$7,500	--
Utility financing	$7,500	--
Your upfront cost	$0	--
Annual payments	$960	--
Annual bill savings	$1,200	--
Net bill savings per year	$240	--

Which option are you most likely to choose?

1. Option A – Utility-financed improvements
2. Option B – No improvements

98. I'm not sure

B12. [IF B11=2,98] Can you tell us more about why you would not participate in this offer? [OPEN ENDED]

C. *Financing Awareness*

[ASK C1 - C2 IF A3 =1, 2 (Homeowner)]

C1. Which of the following resources have you consulted in the past 12 months to research available financing options for energy-related home improvement projects, such as a new heating and cooling system or new windows? Select all that apply. [ALLOW MULTIPLE RESPONSES]

1. A contractor
2. My current lender
3. My utility or local government website
4. Social media or online forum (i.e., posting a question on NextDoor.com)
5. Online search
6. Viewing ads seen online or elsewhere
7. A relative or acquaintance
8. Other: [SPECIFY]
9. None

C2. Please indicate payment methods listed below you have used to pay for new equipment or upgrades for your home with a total cost greater than $1,000. Select all that apply. [ALLOW MULTIPLE RESPONSE]

1. Credit card financing (paid off immediately)
2. Credit card financing (paid off over multiple months)
3. Unsecured personal loan from a bank or credit union
4. Second mortgage, home equity or other secured loan
5. Contractor or manufacturer financing
6. Property assessed clean energy (PACE) financing (repaid on your property tax bill)
7. None of these options apply to me

C3. If you were faced with a near-term need to pay for a major improvement to your home that would cost around $5,000, how concerned would you be about the following? [Present 4 randomly selected barriers; Force response for each barrier]

ID	Potential Barrier	1 (Not A Concern)	2	3	4	5 (Very Significant Concern)
A	I don't have enough cash on hand right now to pay for this					
B	I don't know of a contractor who can install this improvement					
C	I need financing but don't know what financing options are available					
D	I need financing but I may not qualify for a loan					
E	I need financing but the interest rate I will have to pay may be too high					
F	I need financing but I may not be able to manage monthly payments					
G	I don't know if I'll live in my home long enough for a large purchase to be worthwhile					
H	Getting affordable financing will take too long and be a hassle					

C4. Would you have other financial concerns that were not listed? [OPEN-ENDED]

D. Financing Experience

ASK D1 THROUGH D3 IF ONE OF THE FOLLOWING APPLIES:

- A6 = 1 FOR AT LEAST ONE ITEM
- A9=1 FOR AT LEAST ONE ITEM

D1. Earlier you indicated you installed the following equipment or upgrades in the last 12 months: [LIST ITEMS IF A6 = 1 OR IF A9**=1**]

D2. Were you involved in the purchase, or are you generally familiar with the details of the purchase?

1. Yes
2. No [SKIP TO Section F]

98. Not sure [SKIP TO Section F]

D3. [ASK IF A6 OR A9 INCLUDES MULTIPLE ITEMS] Which of these items was the most expensive?

1. [LIST ITEMS IF A6 = 1 OR IF A9**=1**]

98. Not sure [SKIP TO Section F]

Thank you. For the next questions, the phrase "your project" will refer to the following item: [INSERT RESPONSE TO D3]

D4. Approximately how much did your project cost, including any installation and delivery charges? $_____[Numeric]

D5. How did you pay for your project? If you used multiple methods, just indicate the one you used for the majority of the cost. [RANDOMIZE LIST]

1. Cash or check
2. Credit card financing (paid off immediately)
3. Credit card financing (paid off over multiple months)
4. Unsecured personal loan from a bank or credit union
5. Mortgage, home equity or other secured loan
6. Contractor or manufacturer financing
7. Borrowed the money from relative or friend
8. Someone else paid for it (i.e., a relative or friend)
9. Other: [_SPECIFY____]

98. Don't know

D6. [If D5 = 1, 2, 7, 8] Why did you decide to use that method to pay for your project? [RANDOMIZE LIST]

1. I had the cash available
2. I wanted the credit card reward (i.e., bonus points or cash back)
3. I didn't think it was a big enough purchase to need to finance it
4. I don't like to use financing unless I have to
5. I wasn't sure I could qualify for financing
6. I didn't know what financing options were available
7. Financing was too much hassle/Cash was easiest option
8. Contractor would only accept cash or check

9. Other [__SPECIFY _____]
   98. Don't know

D7. [If D5 = 3,4,5,6] Why did you use financing or credit to pay for your project, instead of cash? Please choose **up to two** of the choices below.

[RANDOMIZE LIST]

1. Wanted to include as part of a new home purchase or mortgage refinancing
2. Wanted the credit card reward (I.e., bonus points or cash back)
3. Did not have the entire amount available in cash
4. Wanted to take advantage of an attractive interest rate offer
5. Wanted the monthly energy bill savings to be greater than monthly financing payments
6. Wanted to preserve cash savings
7. Other [___SPECIFY _____]
   98. Don't know

D8. [If D5 = 3,4,5,6] What was the approximate APR (annual percentage rate) for the financing you used?
$_____[Numeric]

D9. [If D5 = 3,4,5,6] Did any of the following features apply to the financing you used? Select all that apply. [RANDOMIZE LIST, ALLOW MULTIPLE RESPONSE.]

1. Initial period with 0% interest
2. Loan application and closing using only online documents
3. Loan approved within 3 days or less
4. Financing provided by a lender you have used before
5. Loan product was endorsed by a utility, government agency, or non-profit group
6. Loan period longer than 5 years (longer than 60 months)
7. Allowed a credit score below 640
8. Did not require a credit score
9. [None of these apply to me]

D10. Imagine that the payment option you used was not available to you. What would you have done instead?

1. Paid for the exact same project using a different method
2. Downgraded to a less expensive model or smaller project, and paid using a different method
3. Delayed the project for a period less than six months, and paid using a different method
4. Delayed the project for a period more than six months, and paid using a different method
5. Not completed or planned to complete any project at all
6. Other [_____SPECIFY _____]
   98. Don't know

D11. **[If D10=1,2,3,4]** What method would you have used if the payment option you used was not available?

1. Cash or check
2. Credit card financing (paid off immediately)
3. Credit card financing (paid off over multiple months)
4. Unsecured personal loan from a bank or credit union
5. Mortgage, home equity or other secured loan
6. Contractor or manufacturer financing
7. Borrowed the money from relative or friend
8. Someone else paid for it (i.e., a relative or friend)
9. Other: [_____SPECIFY _____]

98. Don't know

E. Building Information

E1. Which of the following best describes the building you live in?

1. Single-family home, site built
2. Single-family home, manufactured
3. Townhouse/rowhouse (connected by one or two walls to other units)
4. 2-4 unit multifamily
5. 5-9 unit multifamily
6. 10+ unit multifamily
7. Other: [_SPECIFY_]

98. Don't know

E2. What is your home's primary space heating fuel?

1. Electricity
2. Natural Gas
3. Propane
4. Fuel Oil
5. Wood
6. Other [__SPECIFY __]

98. Don't know

E3. What is your home's primary space heating equipment?

1. Furnace
2. Boiler
3. Heat Pump
4. Built-in Electric Heat (such as baseboard heating, or cadets)
5. Other [__SPECIFY ___]

98. Don't know

E4. Does your home have air conditioning? Select all that apply. [Allow multiple response]

1. Yes, heat pump

2. Yes, central air conditioning
3. Yes, window or room air conditioning
4. Yes, evaporative (swamp) cooler or other
5. No

98. Don't know

E5. How well-insulated is your home?

1. Very well-insulated
2. Somewhat well-insulated
3. Not too well insulated
4. Not at all well-insulated

98. Don't know

F. Customer Information / Demographics

F1. What is your total annual household income?

1. Less than $19,999
2. $20,000 to $34,999
3. $35,000 to $49,999
4. $50,000 to $74,999
5. $75,000 to $99,999
6. $100,000 to $149,999
7. $150,000 or more

98. Prefer not to say

F2. What is your highest level of education?

1. No or some high school
2. High school graduate
3. Some college
4. College graduate
5. Graduate degree

98. Prefer not to say

G. Close

G1. This completes the survey. Your responses are very important to KCP&L. We appreciate your participation and thank you for your time.

H. Early Termination Screen

Based on your answers, the remainder of our questions do not apply to you. Thank you for taking the time to respond to our survey.

Appendix B. U. S. Census Quick Facts for KCP&L Counties (2017 Estimates)

County	Total Population	Housing Units	Owner-Occupied Housing Unit Rate	Median Gross Rent	Median Household Income	Persons In Poverty (%)
Andrew	17,555	7,336	77.1%	$736	$54,804	9.7%
Atchinson	5,275	2,961	69.3%	$540	$43,438	12.8%
Barton	11,850	5,595	68.4%	$498	$38,877	16.1%
Bates	16,334	7,845	70.7%	$619	$41,520	13.8%
Benton	19,074	14,209	81.6%	$593	$33,428	17.9%
Buchanan	89,065	38,775	63.0%	$715	$46,680	17.8%
Carroll	8,796	4,646	74.4%	$530	$41,537	16.6%
Cass	103,724	41,802	75.2%	$924	$63,613	8.7%
Cedar	14,073	7,247	68.2%	$602	$33,720	19.8%
Chariton	7,480	4,151	76.6%	$517	$41,773	13.3%
Clay	242,874	98,082	69.9%	$851	$63,702	8.4%
Clinton	20,554	8,990	73.8%	$772	$57,486	10.4%
Dade	7,588	3,952	77.5%	$600	$37,904	17.5%
Daviess	8,361	4,195	78.1%	$546	$43,669	16.9%
DeKalb	7,919	4,341	63.0%	$507	$43,538	15.7%
Gentry	6,665	3,206	74.0%	$576	$44,024	14.6%
Grundy	9,949	5,008	68.7%	$570	$40,187	17.1%
Harrison	8,524	4,387	71.2%	$565	$41,173	18.1%
Henry	21,718	10,970	74.9%	$691	$42,707	20.7%
Holt	4,413	2,798	69.7%	$454	$41,017	14.1%
Howard	10,139	4,590	75.7%	$648	$45,762	15.9%
Jackson	674,124	323,375	58.5%	$820	$48,104	15.5%
Johnson	53,897	22,306	59.4%	$744	$48,977	14.4%
Lafayette	32,641	14,809	74.1%	$646	$50,830	12.7%
Livingston	15,173	6,821	67.8%	$609	$44,266	17.6%
Mercer	3,678	2,129	74.7%	$521	$41,817	13.6%
Nodaway	22,472	9,747	55.6%	$626	$39,908	17.0%
Pettis	42,558	18,298	66.9%	$675	$40,467	15.2%
Platte	101,187	41,881	64.6%	$915	$70,879	6.1%
Randolph	24,945	10,758	73.9%	$615	$40,638	16.1%
Ray	22,855	10,077	77.6%	$712	$53,459	11.0%
Saline	22,660	10,188	67.4%	$631	$40,645	15.9%
St. Clair	9,362	5,648	77.0%	$487	$33,750	20.7%
Vernon	20,437	9,583	65.8%	$626	$40,655	17.5%
Worth	2,057	1,272	73.9%	$485	$44,974	14.2%

Source: U. S. Census Bureau, https://www.census.gov/quickfacts/fact/table/US/PST045217

Appendix C. Detailed Financing Product Comparison

Program Type	Credit Card	Unsecured Personal Loan	HELOC	PACE	On-bill Financing	PAYS
Example	**VISA Classic Credit Card from Joplin Metro Credit Union (Joplin, MO)**	**Great Plains Credit Union Signature Loan (Joplin, MO)**	**Commerce Bank Home Equity Line of Credit (Multiple locations))**	**Missouri Clean Energy District/HERO PACE (multiple locations in KCP&L territory)**	**Illinois Energy Efficiency Loan Program (Illinois IOU territory)**	**PAYS (Hypothetical)[a]**
Comparison of Features						
Overall Cost	**Poor.** Est. total cost is $9,583 over 10 years. Interest fixed at 12.9% APR. No set term so borrower may continue to make payments for indefinite period. May require security deposit of up to $500, and may include an annual fee of around $30.	**Good.** Est. total cost is $6,397 over 5 years. Rates are high starting at 9.75% APR, depending on credit score and term. But maximum term is 5 years, limiting impact of interest rate.	**Okay.** Est. total cost is $8,095 over 15 years. Variable rates from 6.00 to 7.50% APR to start. Fees may be 2% to 5% of loan value. May include pre-payment penalty. Borrower may pay interest during draw period and then make payments over a 10-year repayment period.	**Okay.** Est. total cost is $8,390 over 15 years. MCED's forecast rate starts around 6.5%, plus fee of 5%. Additional fee may apply. For some projects, interest may be tax deductible.	**Excellent.** Est. total cost is $6,133 over 10 years. Current rate is 5.74%, regardless of credit. Moderate term lengths up to 10 years. No fees, and the program incorporates available rebates.	**Okay**. Est. total cost is $7,537 over 14 years. 5.74% interest rate, plus a 5% loss reserve fee. Very long terms can result in high interest payments.
Monthly Affordability	**Okay.** Est. $74.36 per mo. Minimum payment due monthly, typically 2-3% of the balance (exact minimum payment no published). Interest accrues indefinitely if balance not fully repaid.	**Poor.** Est. $105.62 per mo. Maximum term is 60 months. Shorter terms results in higher monthly payments.	**Excellent.** Est. $42.19 per mo. Maximum term not published but allows at least up to 120 months.	**Excellent.** Est. $43.56 per mo. Term is EUL of installed measures, up to 20 years.	**Good.** Est. $54.86 per mo. Terms 3, 5 or 10 years.	**Excellent.** Est. $43.37 per mo. Payments are offset by monthly bill savings, making the investment cash flow positive for the participant.
Available Loan Amounts	**Okay.** Credit limit of $5,000.	**Good.** Loan amounts not published, but typically finance from $500 to $15,000.	**Okay.** Minimum loan amount not published, typically at least $5,000. Can provide significantly more financing than most other options, with the exception of PACE.	**Good.** Varies based on property value and equity, typically very flexible (up to 85% of property value). May have a minimum amount of up to $2,500 (not published.)	**Excellent.** Financing amounts from $500 to $20,000.	**Poor-Okay.** Subject to strict bill savings to cost requirements that protect the participant, but limit projects and amount of funding available.
Project Eligibility	**Excellent.** No restrictions on project.	**Excellent.** No project restrictions.	**Excellent.** No project restrictions.	**Good.** Nearly any efficient measure qualifies, includes water conservation measures.	**Okay.** Projects limited to utility-approved measures.	

Program Type	Credit Card	Unsecured Personal Loan	HELOC	PACE	On-bill Financing	PAYS
Ease of Use	**Excellent.** Accepted by most installers. No application or closing paperwork. Transactions almost instant.	**Poor.** Requires an application (not available online) and may take several days to receive approval. Borrower must sign closing documents.	**Poor.** Requires an application (available online), and may require a home appraisal. Can take days to weeks to receive approval. Borrower may need to sign closing documents in person (closing process not published).	**Good.** Online application is approved within minutes. Contractor supports the customer to complete online closing documents.	**Poor.** Program requirements are complex. Application is available online but may take several days for approval. Process from application to funding may take from 30 to 60 days.	**Okay.** Program provides a turn-key service, including energy audit, qualified installer, and quality control inspection. Requires significant time and attention from participants, but provides extensive support.
Customer Eligibility	**Good.** Minimum credit score not published, but marketed to students who may have limited credit history.	**Poor-Okay.** Credit-score based underwriting. Minimum credit score not published, but rates typically escalate rapidly as credit score decreases. May not be accessible to credit scores below 650.	**Poor.** Limited to homeowners with available equity in their homes and acceptable credit.	**Okay - Good.** Limited to homeowners with available equity, but does not rely on credit score. Currently available in limited areas, but growing.	**Good.** Generally limited to homeowners, requires a minimum 640 credit score. Credit score does not impact interest rate.	**Excellent.** PAYS relies solely on bill payment history to qualify borrowers, and allows renters to participate (with the landlord's approval).
Outcome When Borrower Moves	Borrower remains responsible for payments.	Borrower remains responsible for payments.	Borrower remains responsible for payments.	Obligation stays with home, payment of outstanding balance may be negotiated during sale.	Borrower remains responsible for payments.	Obligation stays with home, and is paid by new resident, or owner.
Program Type	**Credit Card**	**Unsecured Personal Loan**	**Home Equity Line of Credit**	**Property Assessed Clean Energy**	**On-bill Finance (non-PAYS)**	**PAYS**
Accessibility by Customer Segment (Combined assessment based on customer eligibility, geographic location, affordability, ease of use.)						
Accessibility to Customers with Good Credit	**Excellent.** Broadly available, multiple transactions from single application.	**Good.** Broadly available, requires new application for each transaction.	**Good.** Limited to homeowners with available equity.	**Okay.** Limited to homeowners with available equity, not accepted by all mortgage insurers. Limited area.	**Good.** Limited to homeowners.	**Okay.** Not as affordable, convenient or flexible as other options available to this segment.

Program Type	Credit Card	Unsecured Personal Loan	HELOC	PACE	On-bill Financing	PAYS
Accessibility to Credit-stressed Customers	**Good.** APR is fixed unlike most credit cards, so those with lower credit scores will not pay a higher rate.	**Okay.** Available to credit-stressed borrowers but adds additional financial stress due to higher rates.	**Okay.** Requires a minimum credit score (not published).	**Okay.** Does not rely on credit score, but borrowers with recent bankruptcies, defaults, late mortgage or property tax payments not eligible. Limited area.	**Good.** Program allows a minimum 640 credit score. Rates do not change based on credit score.	**Excellent.** Credit score is not considered.
Accessibility to Renters	**Okay.** No restriction for homeownership, but no tools to overcome split-incentive.	**Okay.** No restriction for homeownership, but no tools to overcome split-incentive.	**Poor.** Renters are not eligible.	**Poor.** Renters are not eligible. Limited area.	**Poor.** Renters are generally not eligible.	**Excellent.** Renters are eligible and are not exposed to long-term costs.

Appendix D. Residential Rate Classes

Table 11. KCP&L Residential Rate Classes for Single Family Homes, by Category

Code	Definition	Category
1RS2A	Residential w/ Submeter Heat	Residential, Electric Heat
1RS3A	Residential w/ Separate Ht Mtr	Residential, Electric Heat
1RS6A	Residential w/ Elec Heat 1-Mtr	Residential, Electric Heat
1RW7A	Res w/ Water & Sep Space Heat	Residential, Electric Heat
MORH	Residential El Space Heat	Residential, Electric Heat
1RS1A	Residential Standard Service	Residential, General Service
1RS1B	Residential Standard Service	Residential, General Service
MO860	Residential General Serv	Residential, General Service
MORG	Residential General Service	Residential, General Service
1ALDA	Area Lighting	Residential, Other Designation
1RFEB	Res Apartments All Electric	Residential, Other Designation
1RO1A	Residential Other Use	Residential, Other Designation
1RSDA	Residential Standard 3Ph AC	Residential, Other Designation
1TE1A	Residential Time-of-Day	Residential, Other Designation
DSMRS	[not provided]	Residential, Other Designation
FAMRS	[not provided]	Residential, Other Designation
MON26	MV,Pal,Wd Pole,Res	Residential, Other Designation
MON28	MV,Pal,Stl Pole,Res	Residential, Other Designation
MON44	SV,Lclx,Pal,Wd Pole,Res	Residential, Other Designation
MON46	SV,Lclx,Pal,Stl Pole,Res	Residential, Other Designation
MON48	SV,Pal,Wd/Stl Pole,Res	Residential, Other Designation
MON72	MH,Pal,Wd Pole,Res	Residential, Other Designation
MON80	HPS,Pal, Wd Pole,Res	Residential, Other Designation
MON82	HPS,Pal,Stl Pole,Res	Residential, Other Designation
MON84	CustOwn,NonStdLts,Res	Residential, Other Designation
MONSR	Steel Pole Adders,Res	Residential, Other Designation
MONWR	Wood Pole Adders,Res	Residential, Other Designation
MORN	Net metering - GMO-Net Metering Residentl-Gen	Residential, Other Designation
MORNH	GMO-Net Metering Residntl-Heat	Residential, Other Designation
MORO	Residential Other Use	Residential, Other Designation
MOS30	Pal Private Area,Res	Residential, Other Designation
MOS32	PAL Direct Fld, Res	Residential, Other Designation
MOS34	Pal Special,Res	Residential, Other Designation
MOSJR	Pal Adders, Res	Residential, Other Designation