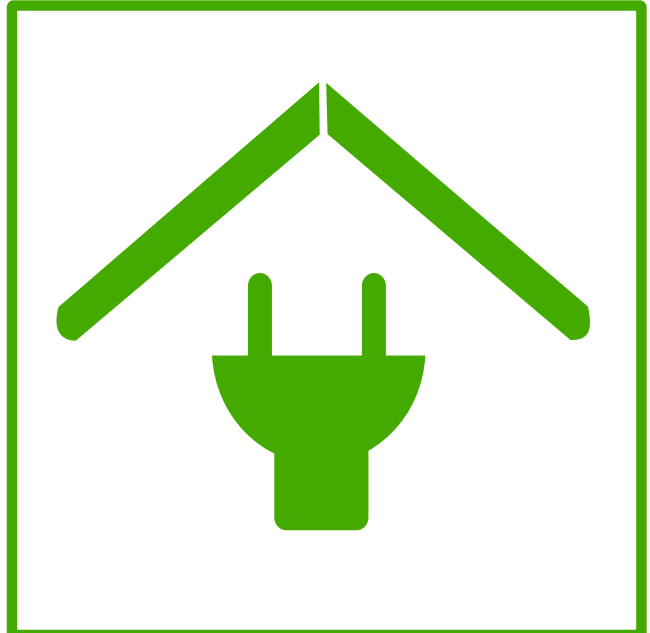


WATER BILL SAVINGS PROCESS EVALUATION



Study for:



Study by:



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Executive Summary

In partnership with Bay Area cities and water agencies, the Bay Area Regional Energy Network's (BayREN) Water Bill Savings Program supports three on-water-bill programs: Windsor Efficiency PAYS®, Green Hayward PAYS®, and the EBMUD On-Bill Program. These three programs allow participants to pay for efficiency improvements through a monthly charge associated with the water meter at the customer's location (as opposed to a loan associated with the customer), with no up-front costs and the assurance that their utility water and energy bill savings will exceed the program charge. The partnerships (and the program) save water and energy at the location where the improvements are installed, while also saving energy through the reduced distribution of water.

This study is intended to assess the three existing programs and provide BayREN with information that can support the regional expansion of these efforts. The regional program has been approved by the California Public Utilities Commission (CPUC) and is currently under development. This document is based on interviews with participating customers, water districts¹, and contractors as well as a review of all available program databases and materials.

Based on the findings in this report, there is a good foundation for a regional effort led by BayREN. BayREN has already established and standardized many of the processes across the water districts. As such, BayREN is a valued resource for participating water districts. Our overarching finding is that BayREN's existing programs are paving the way for the future regional program.

Among single-family participants, the existing programs are leading to changes that would otherwise not have occurred, and for some multi-family owners, it is accelerating the adoption rate of water and energy saving improvements.

- **Multi-family:** Overall, the multi-family customer journey appears to be a positive one, with high levels of program satisfaction and a perception that the program is running smoothly. The largest hurdles are getting the attention of multi-family building contacts (as many are too busy to make time for this program) and the fact that some owners don't want to pay what they characterized as high labor costs, don't like what they see as interest rates, or are skeptical of the savings. Among the participants that we interviewed, all are highly satisfied with the program and all mentioned that they think that other multi-family owners would participate when water is master-metered, and the water bill is paid by the building owner or property manager. (See the section *Multi-Family Owner and Manager Journey through Hayward or Windsor PAYS®* for more information.)
- **Single-family:** Most survey respondents are somewhat or extremely satisfied with their overall program experience (81%). Single-family households are generally pleased with the installation and savings, although many did offer constructive feedback on their experience (described in the section *Single-Family Residential Customer Journey through Windsor PAYS®*). Most survey respondents (87%) feel that other households should participate in the program, indicating a high level of satisfaction and value to customers.

In addition to high levels of participant satisfaction, water districts and the current installation contractor are also highly satisfied. (See *The Program Journey: Stage-by-Stage through the Water Bill Savings Program* section for more information.) The water districts are happy and state that the program does not require significant district resources to implement. Water districts see several benefits to participating, including water savings and the ability to engage customers—particularly multi-family owners who have not been reached by other programs. The current contractor also feels that the program is valuable because it provides credibility and has the potential to attract new projects; however, the program (as currently structured) is only working with one somewhat-unique contractor. Based on our findings, it is

¹ We use the term water district to refer to the water utility and/or town or city that is responsible for the water district.

possible that the program may require a certain type of contractor who is more like an implementer than a typical contractor (described further in the third bullet point below).

Based on this research, there are several challenges that a regional program will need to overcome.

To overcome the challenges for water districts:

- The program should develop guidance and case studies to help water districts maneuver through the issues that they see as barriers, such as the process of establishing tariffs (if needed) and adding the charge to the water bill and/or working with internal stakeholders at the water district or utility (e.g., legal, billing, etc.). The program should also enhance the current guidance for how to deal with successor customers who take occupancy at a location with remaining charges, or alternatively help write this guidance into the tariff.

To help overcome the issues around finding and appealing to customers:

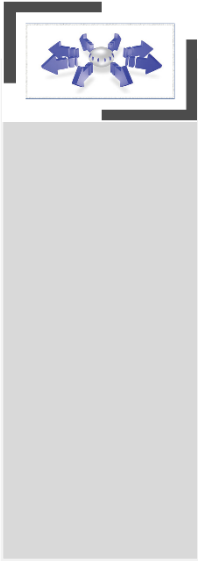
- The program should continue to work with the water districts (specifically the city or town) to market the program. Our findings indicate that customers perceive the district to be a trusted source of information, often with a common objective of meeting a sustainability or conservation goal.
- The program should consider ways of targeting and screening to find the right types of customers since not everyone is a good fit for a water-bill savings program. Targeting and screening can help the program identify those in need of efficiency improvements. Based on our findings, the best candidates are those who currently have inefficient equipment, are unlikely to invest on their own, and envision themselves to be longer-term holders of a property. (Note, however, that being a long-term holder is not a requirement of the program.)

To ensure that the program is successful in working with contractors:

- The program should consider the option of working directly with a few contractors who can meet the needs of the program. The findings suggest that it may take a specific type of contractor, e.g., one with experience with prevailing wage (if required) or other unique and multi-faceted skillsets that allow them to support *multiple* types of water- and energy-saving improvements.

To help streamline the participation process and ensure quality installations:

- The program should continue to look for ways to minimize program-required paperwork and provide clear and easy documentation to help successor customers who take occupancy at a location with remaining charges. It will be important for the program to ensure that successor customers know the benefits and obligations related to program participation prior to purchasing or leasing the location.
- The program should consider changing the type of showerheads since these were frequently replaced by single-family participants. The program should also develop good QA/QC practices for landscaping improvements to ensure that there are no issues.



To understand the potential for the program and whether the offer should be expanded:

- The program should evaluate available data to identify which *water districts* would benefit from participating in a regional program. The program should also look at data that might indicate potential uptake among *customers*. As might be expected, not all customers will be interested or choose to participate. Our findings suggest that the program model may be less attractive for multi-family owners with maintenance staff or people who have the resources to do the work on their own. If it is determined that there is a need to expand the target base (due to limited potential), the program could look for opportunities to expand the offering to better meet the needs of DIYers and those who are skeptical of the “high interest rates” and/or those who may already be able to fund projects on their own. One option is allowing DIY multi-family building owners to use their own staff and/or make improvements on their own. Another option is looking for a way to allow those who have capital to pay upfront. BayREN should also look for opportunities to couple this program with other available programs or the guidance already offered by BayREN’s Energy Advisors.

In addition to the recommendations above, BayREN should also consider future research to help guide the regional WBSP. Specifically, BayREN should consider conducting research with non-participating water districts and non-participating contractors to learn more about their interest in the program model, how to best appeal to new partners, and what support they may need. This future research should occur once the program is more fully designed.

Introduction and Background

BayREN provides energy efficiency programs to households within the nine San Francisco Bay Area counties.² BayREN is funded by California investor-owned utility ratepayers (under the auspices of the California Public Utilities Commission, CPUC), as well as through grants and funding from member agencies, other state and federal agencies, and foundations.

The CPUC directs BayREN to deliver:

1. Activities that utilities cannot or do not intend to undertake.
2. Activities where there is no current utility program offering, and where there is potential for scalability to a broader geographic reach, if successful.
3. Activities in hard-to-reach markets, whether or not there is a current utility program that may overlap.

As part of BayREN's current Water Bill Savings Program, BayREN supports three programs (Windsor Efficiency PAYS®, Green Hayward PAYS®, and the EBMUD On-Bill Program) in partnership with Bay Area cities and counties and their water agencies. Through these partnerships, BayREN supports a unique on-bill program that allows municipal water utility customers to pay for efficiency improvements through a monthly charge associated with the water service and water meter at the customer's location (as opposed to a loan associated with the customer). With no up-front costs, this program is designed to deliver utility water and energy bill savings that will exceed the monthly or bi-monthly program charge. The partnerships save water and energy at the location where improvements are installed, while also addressing the water-energy nexus and embedded energy savings that can be achieved through water conservation.

Three Similar but Different Experiences

The three programs are similar in nature, but vary in when they launched, who they serve, and the improvements that they offer.

Windsor's program began back in 2012, and provided the following services:

- Single family and multi-family residential indoor plumbing fixtures and turf replacement/drought tolerant landscaping (launched in 2012)
- Commercial irrigation system retrofits and weather-based irrigation controller installation (launched in 2014)

This program is still serving existing participants but has not recruited new participants since September 2015.³ The Windsor program is currently on hold as it works through some of the terms and conditions for participants (discussed in more detail later in this report).

Hayward launched its services in 2014, focusing on the multi-family sector. The improvements offered in Hayward are:

- Multi-family residential indoor plumbing fixtures and common area energy improvements (lighting, hot water distribution, HVAC upgrades, etc.)
- Multi-family and commercial weather-based irrigation controllers

² The counties are: San Francisco, San Mateo, Santa Clara, Alameda, Contra Costa, Napa, Sonoma, Solano, and Marin. BayREN excludes households within the city of Palo Alto as all electric and gas utilities are provided by the local municipal utility.

³ Our report includes only the projects through December 21, 2014. There are 18 additional projects that were completed between Jan and Sept 2015, which were not in the database.

EBMUD⁴ began a small pilot program more recently (July 2016) and has focused its limited efforts on the multi-family sector (5+ units) to ascertain the benefits and challenges of this program model. This program includes:

- Multi-family water saving improvements, such as high-efficiency toilets and landscaping measures

A comparison of these three programs (e.g., models, improvements, targets and level of investment) is shown in the table below.

Table 1. Comparison of Water-Energy Nexus Programs Supported by BayREN

	Windsor Efficiency PAYS®	Green Hayward PAYS®	EBMUD On-Bill Finance Program
	SF Res and MF	MF only	MF (and open to commercial although none have participated)
Dates of program activity	2012-2015	2016-present	2016-present
Multi-family (MF) accounts/units	4 points of contact 5 accounts 233 units	5 points of contact 6 accounts 162 units	contacts N/A 3 accounts 89 units
Single Family Residential units	231 homes	None	None
Improvements*	Water- and energy-saving	Water- and energy-saving	Water-saving only No irrigation because it doesn't meet the 5-year cost recovery period required of the pilot
Model	PAYS®	PAYS®	Not restricted to PAYS® requirements
Available Capital (Invested)	\$4M	\$1M	\$150,000
Capital Distributed	\$442,810 (11%)	\$142,933 (14%)	\$16,846 (11%)

*All three programs offer toilets and showerheads/aerators. (Only Windsor allowed for drought tolerant landscaping for residential customers.) Weather-based irrigation controllers and irrigation system repair are eligible in both Hayward and EBMUD. Hayward also allows for central hot water, common area lighting, and other energy efficiency improvements that save energy for the water utility customer.

The program model differs across the three programs. Two of the areas used a Pay As You Save (PAYS®) model. EBMUD offered something similar that does not meet all of the requirements of a typical PAYS® program, principally that customers can decide how they want to finance (with 10-20% decrease, breaking even, or even paying more than the surcharge, or co-pay⁵). EBMUD's pilot also requires that all the improvements have a payback period of 5 years or less (rather than the standard 10 years or less period), which limits the possible improvements offered through the program. EBMUD also acts as their own implementer doing all customer contact themselves.

The types of measures installed through the program also vary. Hayward offers water conservation and common area energy improvements because investing in both water and energy savings supported their city's climate action plan. EBMUD, however, as a water retailer, supports only water conservation improvements, although some of these improvements do include embedded energy savings. For all areas, the surcharge is on the water bill; participants from

⁴ At the time of this study, EBMUD had 3 multi-family participants with a total of 89 units. These were not included in our research.

⁵ Two EBMUD customers selected the decrease of 20%, and one has a co-pay and repayment that matches estimated savings.

all three save water and at least natural gas related to water heating, with Windsor and Hayward participants also saving electricity, depending on the energy efficiency measures they have installed.

Context for the Future

In BayREN's business plan, BayREN is planning to expand beyond the current offerings to offer a regional Water Bill Savings Program. Based on BayREN's analysis, 66 municipal water utilities may be able to cost-effectively offer improvements to single-family and multi-family homes through a tariffed on-bill savings mechanism.⁶ The regional BayREN program is still in the design phase.

There is support for, and a particular emphasis on, water-energy programs—known to many as the “Water-Energy Nexus”—because the treatment and conveyance of water and waste water in California is one of the state's largest end uses of electricity. The CPUC recently authorized a series of pilot programs exploring whether energy savings may be realized through water conservation improvements—seeking to support programs that focus on the water-energy nexus. The Energy Division is currently analyzing the extent to which they should focus the energy efficiency portfolio on improvements that maximize energy savings in the water sector. The Energy Division is also currently considering how cost effectiveness should be analyzed for water/energy nexus programs. (http://www.cpuc.ca.gov/nexus_calculator/) The state legislature also supports the development of water conservation programs. Additionally, reductions of hot water use (which in California is typically heated using natural gas burning appliances) is a practical way to reduce site greenhouse gas emissions.

Any future program will need to take multiple external factors into consideration, including continued restrictions on urban water use and the policies that surround BayREN's programs. These policies include:

- **Policies on water conservation goals.** BayREN members who supply water are affected by SBX7-7, which requires all urban water suppliers to achieve a goal of 20% per capita reduction in water use by December 31, 2020.⁷ The law provided initial help to reach these goals through state programs (implemented by the Department of Water Resources), although several of these DWR programs are now closed.⁸ SB407, enacted at the same period as SBX7-7, supported reducing water use by phasing in specific conservation standards for basic urban plumbing fixtures (i.e., toilets, urinals, showerheads, faucets) and designating old plumbing features (pre-1993) as out of compliance by January 2019. B-29-15 pushed the reductions higher and shortened the timeline. This law requires all urban water suppliers reach a 25% per capita reduction in water use by 2016 over a 2013 baseline. All urban water suppliers met these goals and are on track or ahead of schedule with all required reductions.
- **Policies supporting regional water saving programs.** BayREN will consider applicability of SB564, a recent law that supports urban water districts in the Bay Area (and Los Angeles) by giving a Joint Power Authority (JPA) the authority to implement and fund a regional PAYS[®]-type program. This law restricts the improvements to water-only measures, although there will be embedded energy savings (pumping, water supply, water treatment, and savings from water heating).

⁶ BayREN Energy Efficiency Business Plan 2018-2025. Section 6. Submitted January 23, 2017.

⁷ SBX7-7 has complicated methods to assess savings but is based on daily urban per capita use with variation for indoor and irrigated use that account for variation in climate and population and sums to 20% reduction across the state. Baselines from which each water agency set savings targets were a five-year average with the fifth year ending somewhere between 2007 and 2010.

⁸ The two open DWR programs are: 1) *Calconserve Water Use Efficiency Loan Program*: Established in 2015, this program offers loans to local agencies for specific types of water conservation and water use efficiency projects and programs that seek to achieve urban water use targets. 2) *Save our Water Rebates*: This is a program that provides rebates for removing turf and replacing it with landscapes that require little water at California single-family residences.

- **Policies dictating BayREN’s offerings.** BayREN, as an energy efficiency program manager, currently has a few restrictions on the type of efforts they can deploy. Specifically, they can do things that PG&E (as the relevant program administrator of investor owned utility efficiency programs) doesn’t want to do, thereby not duplicating efforts. PAYS® is a unique offering because it works through water agencies, and because of the size of the individual projects that BayREN programs support. Unlike PG&E’s On-Bill Financing (OBF) program, which has a minimum eligible project cost of \$5,000, PAYS® can support improvements that are as small as a few hundred dollars.
- **Related Greenhouse Gas (GHG) policies.** BayREN, as an energy efficiency program administrator, plays a part in helping meet lofty legislative goals for energy savings that are driven by two main state-level greenhouse gas (GHG) policies, SB350 and SB32.
 - SB32 requires that, over the next twelve years (by 2030), GHG emissions are reduced by 40% over 1990 levels. SB350 supports this policy by requiring energy efficiency savings (as one of the “wedges” of GHG reductions) be doubled over the mid-case values in the 2015 California Demand Energy Forecast.

These external factors provide the context for the development of a future regional Water Bill Savings Program.

Study Goal and Objectives

The study goal is to provide feedback on the existing programs to help inform the development of a regional Water Bill Saving Program. This research focuses on participants. In this stage of the research, we did not conduct interviews with non-participating water districts⁹ and contractors.

The objectives of the study are:

1. To provide insight on customers' perspectives on their barriers and drivers for participating, their understanding of the program benefits and terms, and their satisfaction with the program and program follow up.
2. To provide a description of participating water districts' perceptions of the benefits and barriers associated with the program and reasons for acceptance or refusal to participate.
3. To provide information on contractors' perceptions of the benefits and barriers associated with the program and reasons for acceptance or refusal to participate.
4. To clearly and thoroughly document the program logic and processes.
5. To provide recommendations to improve the existing offerings and support a more regional model.

Methods

This report draws on data collection from participants and near participants (that is, individuals who expressed interest but declined the program). Because many of the populations are limited in size, the overall sample sizes are small.

Overview of Data Collection

Subtask	Description	Details
Participant and Near Participant Data Collection and Reporting		
Data Collection	Upfront listening session and ongoing discussions with implementers	Multiple discussions
	In-depth interviews with participating water districts and key contractor	3 water districts, 1 contractor
	SF residential online survey - participants	45 survey respondents
	MF owners and manager in-depth interviews - participants	6 interviews
	MF owners and manager in-depth interviews – near participants	6 interviews
	Literature review of similar programs	10 studies and follow up discussions
	Review of program databases	Windsor, Hayward

Throughout the report, we use the term respondent to refer to individuals who provided information directly to the research team. This may include single-family survey respondents or multi-family owners or managers (participants or non-participants) who completed an interview.

Upfront Listening Session and Ongoing Discussions with Implementers

Our research included one 45-minute listening session with the implementers to understand the program, followed by a two-hour meeting to discuss the program theory and logic model. In addition, our team was in regular conversations with the program implementers throughout the research effort to help us understand both the existing programs, and

⁹ We use the term “water district” to refer to the water utility and/or town or city that is responsible for the water district.

the proposed regional program. We note that this process was important as the regional program was under development at the time of our study.

In-Depth Interviews with Participating Water Districts and Key Contractor

Grounded Research conducted one-hour interviews with each of the three participating water districts (Windsor, Hayward, and EBMUD), as well as a one-hour interview with the primary contractor (Bottom Line Utility Solutions) who installed most of the measures in all three districts.

SF Residential Online Survey

Grounded Research conducted an online survey of participating single-family households in Windsor. Forty-five (45) individuals completed the survey.

The sample was drawn from a population of 118 active participants with email addresses where “active” meant that they continued to be active in the program through payments to their water district.

As shown in Table 2, the 45 survey respondents are generally representative of the full population of 231 unique accounts, with the survey having a higher percentage of participants with landscaping than seen in the population.

Table 2. Measure Counts of Windsor Population and Survey Completes

Measures Installed	All Participants % of unique accounts (N=231)	Survey Respondents % of unique accounts (n=45)
Showerheads	95%	93%
Toilets	91%	91%
Aerators	73%	78%
Landscaping	22%	36%
Chilipepper*	13%	18%
Clothes Washer	4%	4%
CFLs	3%	7%
Refrigerator	0%	2%

*This is a hot water recirculating pump.

All but one survey respondent lives in a single family detached home, and all but one respondent owns their home. Participant household incomes do not align directly with the residents in Windsor, as they are more solidly middle class than most (discussed more in the report).

Multi-Family Owner and Manager In-Depth Interviews – Participants

Grounded Research spoke with six (6) of eight (8) available owner-manager contacts listed as multi-family participants in the Hayward and Windsor program databases. Of these, four were from Hayward (spoke with 4 of 5 contacts, representing 5 of 6 accounts) and two were from Windsor (spoke with 2 of 3 contacts, representing 4 of 5 accounts since one owner had three affordable housing apartment complexes).

In addition to the eight contacts, there was one account in Windsor (Worldmark) that is a timeshare with no available contact information. The program database did not contain contact information for Worldmark and, given the very different nature of this participant, we did not pursue this contact.

Of the six multi-family owners or managers who responded to our request for an interview, one from Windsor was not aware of the program. This contact indicated that they purchased the nine-unit building in 2015 after the bank foreclosed on the property and replaced the toilets on their own because the toilets were failing. It is unclear why this would have occurred if the building participated. The contact stated that she did not know about the program. We did

not explore the program with this individual, but this was the specific contact provided by the program. As such, the multi-family feedback included herein is from the other five participants.

The five multi-family respondents were provided with a \$100 honorarium for their time and insights.

Note that while we briefly touch on the EBMUD program, we did not interview EBMUD participants for this report.

Multi-Family Owner and Manager In-Depth Interviews – Near Participants

Grounded Research conducted brief interviews with 6 of 12 near participants that had declined the program (representing 7 of 13 accounts).

We also note that there were 14 additional contacts for multi-family buildings that had some contact with the program, but who did not respond to repeated follow up contacts from the program. We attempted to call contacts on this list, but we were not able to complete interviews with these contacts. Either the contact information for these individuals was no longer valid, the individuals no longer worked at the locations, and/or the property management companies had changed. For one building where an alternative contact answered our call, they stated that their building had been through a full rehab in 2017.

All responding near participants were offered a \$100 honorarium for their time and insights.

Literature Review

Grounded Research conducted a web search for other PAYS® programs and reviewed a total of 10 reports that dealt with this type of program. This included a 2013 study specifically covering the on-water-bill pilot at the beginning when it covered just the Town of Windsor. (See Appendix C for more details on the programs we reviewed.) Additionally, we reviewed three greenhouse gas policies (AB32, SB32, SB350), four water conservation policies (SBX7-7, SB407, SB564, Executive Order B-29-15), the California State Department of Water Resources website, program information for PG&E and MCE, and downloaded and analyzed information on the progress by water suppliers towards state mandated conservation targets. (Appendix B includes details on relevant policies as well as the URL link to each.)

Review of Windsor Efficiency PAYS® and Green Hayward PAYS® Information and Program Spreadsheets

Grounded Research reviewed the program tracking spreadsheets for two programs covered by this assessment, Windsor Efficiency PAYS® and Green Hayward PAYS®. We used this information to provide descriptive statistics on the programs, determine customer contact information for our survey, and analyze information from customers collected by the program at the time of customer participation.

Grounded Research also reviewed past marketing materials and FAQs for these programs.

Study Limitations and Notes

The major limitations for this study include:

- Sample sizes were limited due to the small population sizes and some missing contact information.
- Many of the current participants initially signed up to participate more than a year ago (and some as long as 5-6 years ago).
- Some Windsor single-family (SF) participants (estimated at <20 of 231) have been contacted before for prior research studies.
- We were not able to include participants from EBMUD in this research effort.
- We were asked not to contact non-participants under this research effort since the regional program is under development and there was concern about the number of contacts with this group.

In the following sections, we first provide information on the customer perspective for multi-family building owners and managers (*Multi-Family Owner and Manager Journey through Hayward or Windsor PAYS®*), followed by the single-family residential participant view point (*Single-Family Residential Customer Journey through Windsor PAYS®*). We then walk

through the various stages of the existing programs (*The Program Journey: Stage-by-Stage through the Water Bill Savings Program*) to inform the development of a regional program model.

Multi-Family Owner and Manager Journey through Hayward or Windsor PAYS®

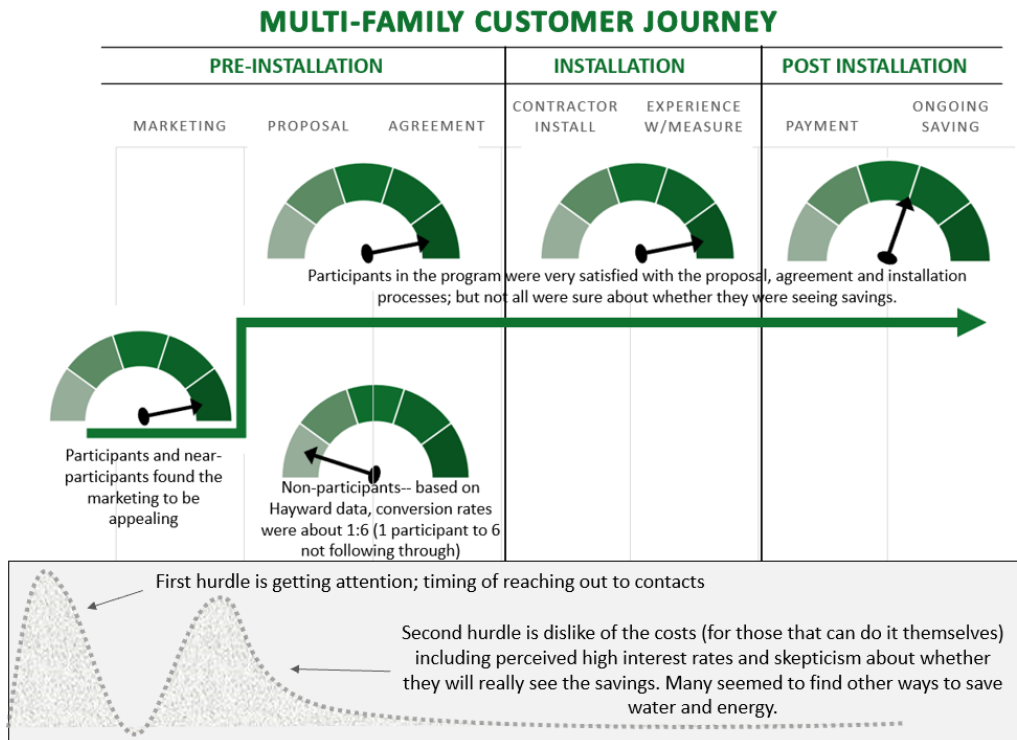
All three of the participating water districts targeted multi-family owners and managers. In total, there are 14 unique multi-family accounts that participated: five in Windsor, six in Hayward, and three in EBMUD’s territory. This research effort explored the multi-family journey by drawing on program databases, feedback from participants, feedback from near participants (that is, those who explored the program but did not act, for Hayward only), and interviews with the water districts and program implementation staff. Note that this research focused on Windsor and Hayward participants, and does not include feedback from the three EBMUD participants.

Overall, the multi-family customer journey appears to be a positive one with high levels of program satisfaction and a perception that the program¹⁰ is running smoothly. The largest hurdles are getting the attention of multi-family building contacts (as many are too busy to make time for this program) and issues with the offer itself (i.e., don’t like the labor or interest costs or are skeptical of the savings).

Among existing participants, all were highly satisfied with the program, and all mentioned that they think that other multi-family owners would participate (if the water bill is paid by the building owner or property manager).

An overview of the multi-family customer journey is depicted in the Figure 1 below and described by stage following the graphic.

Figure 1. Multi-Family Customer Journey



¹⁰ Throughout this chapter we use the term “the program” to describe the three existing efforts that are supported by BayREN.

Pre-Installation

The earliest contacts with the PAYS® program occur through marketing (including flyers, information provided with water bill, email, word of mouth, utility/city hosted presentations and discussions with property owners and managers, etc.). For those multi-family building owner/managers who express interest, further contact is made by the implementer (or contractor) to explain the program and gather basic information about the building. This often takes multiple discussions. For those who are open to participation, the contractor visits their building or complex, populates a spreadsheet with the site information to present the options available to the specific building, and then follows up with a proposal. Some of the multi-family owners and managers drop off at this point because the program is not the right fit (detailed explanations are provided under “Drop-Offs” below), while others make the decision to participate and move into signing the program contract. These pre-installation stages (marketing, further discussions, decision making, and contracting) are discussed further below.

Marketing

Several participants indicated that it is difficult to get face time with property managers and owners because they are busy (e.g., due to filling vacancies, dealing with fires or other pressing issues, repairing broken appliances, meeting tenant needs, etc.), and their first priority is maximizing revenues by making sure that their units are fully occupied and their tenants are happy. Once those criteria are met, then there is more time for them to think about the operation and maintenance of their building. Often this means that the implementer or contractor only has a few minutes to make the case for this program and then even once they make contact, the information or follow up can get lost in the shuffle of the customer’s daily activities.

According to feedback from those involved in the administration of the program, the program was reasonably easy to promote in Windsor because of the small number of multi-family buildings, but in Hayward, it was much more difficult to get traction. Hayward has a couple hundred multi-family buildings—many of which are small or medium-sized buildings (under 100 units). The City of Hayward attempted to reach out to these building owner/managers through direct mail, but many multi-family buildings contacted did not respond to this first attempt.

While not all multi-family building owner/managers can make the time for this program, the existing marketing methods worked well for both participants and near participants. Multi-family contacts said that it was clear that the program was being offered by the city (i.e., the City of Hayward or Town of Windsor), and all, including those who did not end up participating, were very interested by the initial information provided, although one mentioned that they originally found it “too good to be true.” Several participants and near participants mentioned that they heard about the PAYS® program from the city’s all-day meetings for building owners and managers (e.g., crime-free meetings). Several mentioned that these city-based meetings are a great (and credible) way to connect with multi-family properties.

Saving water was the primary driver for multi-family interests. Some participants also realized that they would have to upgrade toilets in 2019 and that this program basically allowed them to do that “for free with savings more than paying them back.” Another participant mentioned that “The ROI (return on investment) study they provided looked promising and because it was the middle of a drought during the time they participated, this was a complete no-brainer for them as they pay the water bill.” However, not all multi-family owners and property managers that we spoke with were aware of the fact that there is a state requirement to upgrade old (pre-1993 toilets) to more efficient toilets by 2019. For some multi-family building owner/managers, the ROI was not persuasive. In addition, the contractor said that for many busy multi-family rentals, water savings are “peanuts” relative to rents and the fact that entering a tenant’s unit can make tenants upset.


While the comments about the PAYS® marketing were positive, there was some program confusion with other similar programs, such as the Energy Upgrade program. When talking about “the program”, they sometimes described participating in the Energy Upgrade program (because some of their buildings participated in that program) and sometimes referred to the PAYS® program. They also talked about this PAYS® program as a “rebate program”.

Further Discussions with the Implementer/Contractor (T&Cs)

Even though the structure of the program is more complex than a rebate program, most (both participants and near participants) found that the program and program information was easy (or very easy) to understand. However, one also noted that “most of the information that [the multi-family owners] got was in person.” It often took quite a few discussions to make the decision to participate, but “[Bottom Line] was very nice and patient with explaining everything.”¹¹

As shown in Figure 2, in general, both participants and near participants seem to have understood the program. We explored eight specific program terms and conditions with participants, and while there were a few that some participants were less likely to have understood prior to participating, in general, they expressed feeling that they understood.

Figure 2. Multi-family Understanding of Terms and Conditions—Participants only

		Fully Understood (n)	Did not Understand (n)
	Least likely to have understood prior to participating		
	<i>Did not fully understand</i>		
	<ul style="list-style-type: none"> That charges would stop if the upgrades failed and were not repaired (1 understood but commented “still unclear who to contact”) 	1	4
	<ul style="list-style-type: none"> That charges would stop if you sold your home and disclosed participation to the buyer (understood, but condo association where this didn’t apply in the same way as with other multi-family units) 	2	3
	<ul style="list-style-type: none"> That savings would immediately exceed changes (“can’t say he fully understood at the time, but have heard that the water bill consumption went down” and “eventually over time”) 	3	2
	<i>Understood</i>		
	<ul style="list-style-type: none"> How program costs would show up on your bill 	4	1
	<ul style="list-style-type: none"> Program fees 	5	0
<ul style="list-style-type: none"> The potential energy bill savings 	5	0	
<ul style="list-style-type: none"> That the homeowner is responsible for general maintenance and improvement of the program 	5	0	
<ul style="list-style-type: none"> The potential water bill savings 	5	0	
Most likely to have understood			

Notably, the *warranty* (i.e., that charges would stop if the upgrades failed) was not well understood, and most likely was not used as a selling point for past participants. The contractor also explained that all of their work generally has some warranty under state laws, and that even where it doesn’t, the company usually fixes any issues. As such, this service did not appear to be a defining characteristic of the program.

Drop-Offs (Those Not Converted to Program Participation -- Near Participants)

During the proposal stage (either before or after receiving an actual proposal), many multi-family contacts found that this program was not a good fit for them and dropped off (see bullets below for the detailed reasons individuals did not participate). In total, at the time of our reporting, about 15% of contacts in Hayward had decided to participate and 85% did not follow through (although some proposals are still under consideration).¹² According to the contractor, it was

¹¹ Bottom Line Utility Solutions was the primary contractor for the program.

¹² This information was for Hayward only. Information was not available for Windsor, but the contractor described the Windsor multi-family population as much smaller, with several of the buildings owned by the same owner.

often hard to get traction after the proposal was sent and for some, the program is “too difficult, too costly (because of the labor costs), and too easy to go the other way” (presumably since there are other programs or other resources available to many multi-family buildings). The number of units converted is shown in Table 3.

Table 3. Hayward Participation Conversion Values (from database)

	Hayward Contacts	Number of MF Units
Participated	6 <i>(6 of 40, or around 15% conversion)</i>	162
Did not participate	34	2,098
<i>Declined*</i>	<i>(12)</i>	<i>(848)</i>
<i>No response*</i>	<i>(14)</i>	<i>(798)</i>
<i>Still under review at time of evaluation</i>	<i>(8)</i> <i>(with one representing 544 units)</i>	<i>(1,291)</i>
Total Leads	40	3,099

*These categories were provided by the implementer and refer to either declining the offer after receiving the proposal, or not responding to the implementer after receiving outreach from the implementer.

Feedback from those who expressed interest in the program but did not end up participating can help to understand both the barriers to participation, as well as the potential for this program to scale. These multi-family contacts expressed that they are inundated with requests (some of which are credible and some of which are not). Notably, there were a couple that expressed that the PAYS® program model did not appear to make sense for multi-family buildings with maintenance staff or anyone who could afford the equipment and had the resources to do the work on their own.

- (3) Three expressed that the PAYS® program model does not make any sense and would not make sense for any multi-family properties. They recalled having discussions about it but indicated that “the interest is so high it doubles and triples what you would need to pay.” One of the multi-family contacts (with two buildings) stated that he clearly recalls the program, but that it was too expensive and didn’t make sense. He described his desire to change some outdoor lighting fixtures to better looking ones, but that the program offered to install LEDs for \$39 per bulb instead. He indicated that he could change out the whole fixture himself for less. Both of his buildings ended up participating in alternative programs such as rebate programs or an Energy Upgrade program. The participant with two buildings said that while he did make changes to improve efficiency (lighting, windows, showerhead and aerators), he did not end up changing out the toilets at his buildings.
- (1) One individual (with an 8-unit building) indicated that there weren’t any savings in his building because they had relatively new toilets at the time that they contacted the PAYS® program. Someone did come onsite and provide a proposal, but it was not “cost-effective.” He did not feel the program provided enough benefit because he believed that their toilets were already efficient. This respondent was also not aware of any upcoming state requirements for increased efficiency. His building did participate in a PG&E program that provided lighting and air sealing.
- (1) One purchased and installed toilets on her own and received a rebate through another program. In addition, she went to City Hall (in Hayward) and was able to pick up aerators and showerheads that she installed on her own. She was unable to distinguish between the PAYS® program and the rebate program that she participated in.

- (1) One was interested and said that she went to a meeting, put her name on a list to get information, but stated that she never heard back from the program.¹³ The owner of her building replaced 214 toilets with low-flow toilets in July 2018 to comply with upcoming state requirements. She did not think that they received any support from any programs, although she stated that this property had participated in a PG&E program in the past.

Among the six near participants that we interviewed, five took some energy and water saving actions either on their own or through other city or PG&E programs; however, none seemed to attribute it to the PAYS® program (i.e., there appears to be very little non-participant spillover among these respondents).

Even among those that ended up participating, there was some skepticism in the early stages. One stated that potential participants need to get past the hurdle of “not being confident that they will see the savings,” but once past that hurdle they are good.

Some participants received rebates in addition to using the on-bill offer from PAYS® (e.g., all Hayward participants got toilet rebates, according to the water district), which lowered their measure cost and monthly surcharge. This appears to be a positive way to reduce the costs for the customer. The exact programs from which these customers obtained those rebates were not tracked, which makes it difficult to assess how many of these customers would have used PAYS® without the rebate, and what affect, if any, the inclusion of rebates might have on scaling the program. Customers who received rebates did not appear to differentiate between the PAYS® and rebate programs.

Decision Making and Contract Signing

Among the five participants who provided feedback, all appear to have had other access to capital, although they may not have the desire to use their capital for this purpose. One was an affordable housing property manager whose firm regularly uses other funding sources for rehabilitation of their properties.

The decision-makers for this program can look very different depending on the ownership of the building or complex. One participant with two buildings was a large investment firm, and one was a condo association where the association pays the water bill. The decision to participate was often made by the building owner (which was sometimes a family), but in a couple of cases it was made by a CEO or in one case (for a condo), a Board of Directors.

At the contracting stage, one mentioned that “some of the contracts and forms were not user friendly.” This person described the small font on a four or more page form, and that there was lots of information that took time to understand. Another mentioned that while it took time to go through all of it, it was understandable. But by the time participants signed the documents they knew what they were getting into. The contractor, however, mentioned that many of the participants and non-participants find the agreements to be long and complex. There are multiple agreements to allow the contractor on site, allow installation, and allow changes to the customer’s bill. For some who feel they need to get their lawyers involved, this step can become costly.

Notably, three participants mentioned that not all of their buildings or units participated. According to one Hayward respondent, 68 of 216 condos participated. This was in an HOA for condos (not an apartment building) where the units were individually-owned and each owner had to make the choice to allow contractors into their unit or not. Another Hayward participant expressed that they have multiple buildings that participated, but one building in Hayward did not participate because “the scope of work— did not work well for them” in that building, and the owner had already done

¹³ Note that according to the program records, this individual was contacted and the program visited the site to collect information so that they could provide a detailed proposal. This individual may not remember the interaction since it occurred several years before being contacted by the research team.

a lot of work on their own before the program gave them a proposal. A third individual mentioned that in their non-participating building some of the toilets were “too new to qualify.”¹⁴ No other information was provided.

Installation



Contractor and Installation Process

Satisfaction with the program contractor was very high, with one participant noting that “the communication has always been there, and they were always prompt at getting back [to him].” Another participant mentioned that the process was “real smooth and done quickly” once approved. Only one of the five mentioned “a few minor hiccups with a tenant notifications and products” but he did not feel that it was a big issue.

Measures Installed

As shown in Table 4, the types of measures installed across the two cities varied. Windsor focused on water-saving measures, while Hayward also offered participants both water-saving measures and the option of energy-saving measures. In Hayward, the home owner association installed most of the energy measures shown below, although five of the six Hayward participants did install common area lighting.

Table 4. Number of Measures Installed in MF Units

Location	UNITS	Water Measures 						Electric Measures 		
		Faucet Aerators	Toilets	Showerhead	Hot Pipe Insulation	Hot Water Recirculation Pump Controller	Water Based Irrigation Controller	Common Area Lighting	In-Unit LED	In-Unit Lighting
Windsor	233	846	702	664	0	0	0	0	0	0
Hayward	172	287	214	127	1	1	3	2264	138	36

In general, based on self-reported data, participants were split in terms of whether they would have made changes on their own. Among the two who stated that they would have definitely changed out the toilets, they would have done this one unit at a time as people moved out, and at least one said that they may not have installed the high-efficiency toilets. They also would not have installed the aerators and showerheads. One respondent said that they would make some of these changes on their own but once “we understood that Hayward was paying us back for work that we already do, we enrolled because it was a nice way to get paid back for work we already do and reduce our costs.” However, he did mention that he most likely would not have installed *low-flow* toilets or *high efficiency* lighting. Finally, the owner of affordable housing units mentioned that they need to upgrade their facility every 15 years because of regulatory contracts, so that is probably when they would have next made changes on their own; however, they would most likely have met the minimum requirements. These comments seem to indicate that the program is inducing changes among participants. This type of a program is not expected to have any free-ridership.

¹⁴ The program generally recommends replacing 1.6 gpf with 0.8 gpf toilets if use or water rates can support it from a cost-effectiveness perspective, but the program would not recommend replacing “new” 1.28 toilets.

This finding is supported by the Windsor representative, who noted that prior to this program, they were not able to get any penetration of low-flow toilets in multi-family properties. Their prior programs were not of interest. The PAYS® program allowed Windsor to get penetration into the town’s multi-family market.

Experience with Measures

Participants did provide some feedback on a couple of the top water savings measures installed through the program (see bullets below).

- **Toilets:** Three of the five mentioned comments related to toilet size. Two of these stated that a couple of their tenants mentioned that the toilet seats were too small; however, both indicated that you always hear from one or two tenants when you make changes. Only one of these three mentioned that some tenants had complained that the toilets did not flush strongly enough.
- **Showerheads and aerators:** One respondent (with two buildings) provided feedback on the showerheads and aerators, saying some tenants disliked the low-flow showerhead and aerators— (and may have changed them out themselves).

Post-Installation

Ongoing Savings

The five participating multi-family respondents were either happy or neutral about the savings. Three of the five felt that they saw water savings, with two indicating that they were delighted with the savings because their water bills had gone down drastically. The two others seem to indicate that they couldn’t really tell. One of these was directly referring to not seeing any savings in the bill amount (rather than usage), while the other couldn’t tell because of tenant usage and problems with water leakage in their pools that made it difficult to identify the savings. The respondent stated “I wish I had gotten more information after the fact to follow the savings ... [I] can look at bills and compare to previous year but it would be difficult to figure out.” [Ideally I would want] “more examples about the savings across time to demonstrate the actual savings.”¹⁵

One respondent with two participating buildings uses a property manager and only sees the consolidated bills for the total building portfolio, not by building, so the savings are not apparent.

Among participants, there is some evidence that the program is leading to additional savings outside of the program (i.e., participant spillover). For one individual who had two buildings go through the program, they also included similar measures for their newer buildings where they were working with contractors. Also, the program followed up on several multi-family sites that did not participate and found that five had installed low-flow toilets outside of the program.¹⁶ Some of the non-participants directly indicated that the program made them aware of water conservation options, and then installed the measures on their own.

New Owners

There is less owner/management turnover within the multi-family sector compared to residential, yet within the five years since the program began, one building was foreclosed upon and had new owners with a new property manager after only two years of participation. The requirement of disclosure in the program did not appear to make it to the new manager as she did not believe they ever paid any surcharges.

¹⁵ Notably, further measuring and communicating savings through the bill is tough since billings systems are designed to measure usage, not savings.

¹⁶ These five installed from 12 to 319 toilets, which the program implementer estimated to save 3.3 million gallons of water per year.

For the condo, program costs were borne by the condo association and not the individual unit owners, because water was metered at the condo level for these buildings. So as units are sold, there is no transfer of costs even though owners do change.

Payments

Interestingly a couple of the multi-family participants seem to have thought that they had already paid off the program. However, the database information does not appear to support this because the minimum time to pay off the surcharge was five years (some were 10 years). The program implementer also confirmed that all multi-family accounts still have active charges so the respondent may just not be aware of the surcharge.

Future Participation (Multi-Family Owners)

Our findings show that the marketing methods were very successful in piquing interest among multi-family owners and property managers—even those who did not end up participating; however, there are still a large number of buildings that did not move beyond the stage of receiving direct mail from the city (and may not even know about the program).

For multi-family participants, there appear to be some barriers to participation, but notably, some of the largest barriers to participation *can and often do* still result in the water saving measures being installed.

- **Face time with potential participants.** One barrier will be connecting with the right people (since they tend to have competing priorities), but the past methods of outreach have been successful, according to participants.
- **Misalignment of program with the perceived needs of the target audience.** The largest barrier to participation appears to be that the structure of the program (including costs for the installation of the measures and payment terms, i.e., interest rates too high) does not align with their needs and available resources. Those with the money or means to do this feel they are better off if they complete the project on their own (and not through the program). However, this may still result in savings, as we learned that some near participants did install measures on their own.
- **Competing programs (although these were not framed as “competing” by respondents).** Several of the near participants (and some participants) used alternative programs.¹⁷ This still resulted in savings, although the water savings are not always to the degree that would have occurred through the PAYS® program.

While the program takes a while to understand, the process is generally easy and there are very few complaints about the improvements. Participants are either delighted with the savings, or neutral because the multi-family building owner doesn't have complete transparency about the savings because of other non-program variables. Additional information is needed to fully understand whether the full list of participants are still “active” since a few believed that they had paid off their debts (but they were not sure).

There were very few suggestions from participants for how to improve the program. Based on the few comments made about the types of programs that they would be interested in for the future, some near participants suggested that they would like rebates where installation can be done on their own. Near participants also tended to describe their participation in programs that offered both energy and water savings, with a focus on energy savings. In addition, one participant indicated that for him, it would be better if there was a program that would allow them to make changes as tenants move out (rather than waiting for when they can change out all toilets or lighting in a building). Notably, this would be a more expensive way for the program to operate.

¹⁷ Based on program records, some used PG&E's multi-family rebates or BAMBE.

Based on feedback from both the water districts, the program contractor, and multi-family building owners and managers, the best targets for a future program may include multi-family contacts with the following characteristics:

- **Aggregated water bill paid by landlord, property manager or home owner association**
 - When the water bill is paid by a single account, it is easier to see the savings. Note that this is who the program currently targets. All participating properties have this feature.
- **Smaller multi-unit buildings¹⁸** (e.g., those with fewer than 100 units and/or no maintenance staff)
 - Large buildings with maintenance staff often feel that they can do this work on their own and are more interested in do-it-yourself (DIY) rebate programs, rather than programs where the owner will have to pay prevailing wages.
 - Among Windsor multi-family participants, the buildings ranged from 11 units to 228 units, with the median being 41-60 units. Among Hayward multi-family participants, the buildings ranged from 5 to 68 units, with the median being 19-24 units.
- **Owner of multiple buildings**
 - Participants with multiple buildings often did work in more than one building, minimizing the program costs. In addition, even when some of their sites were not ripe for participation (because the buildings were already efficient or already being renovated) there were often some opportunities.
 - There were participants in both Windsor and Hayward with multiple participating buildings.
- **Long-term holders of a property**
 - Long-term holders of a property are not intimidated by the payment period (5-10 years). For those market-rate buildings that may be bought or sold within a couple of years, they are hesitant to put any constraints on the property (e.g., from a financing charge) and the surcharge is seen in a similar light to a lien, even though it is not a lien. This can complicate an ownership transfer.
 - We did not collect information on how long owners were intending to hold these properties; however, one did turn over to new management.
- **Capital not easily accessible for conservation**
 - Several of the participants in Hayward were market-rate housing (although they stated that their rents are “affordable”); however, some market-rate buildings and complexes prioritize available capital for more aesthetic issues (such as granite countertops).
 - There is some indication that affordable housing may be more in “need,” but only one respondent’s buildings qualified as affordable housing or non-profit.
 - This was a comment made by water districts and the contractor; however, many participants did seem to have access to capital.

¹⁸ While not mentioned by participants, age of the building should also be taken into consideration since plumbing standards have changed over time; building age may be a good way to target.

Single-Family Residential Customer Journey through Windsor PAYS®

One of the three water districts, Windsor, offered a water bill savings program to single-family residential customers from 2012-2015. This study examined 231 unique Windsor water accounts (i.e., single-family homes) that participated from 2013 to 2014. As part of this research effort, we explored the program experience from the perspective of single-family Windsor participants to understand barriers and key drivers for participation, customer understanding of program terms and conditions, and customer satisfaction with the program. Throughout this chapter, we refer to these customers as “residential participants”.¹⁹

Residential Windsor Efficiency PAYS® participants went through three stages as part of their customer journey. (See Figure 3.)

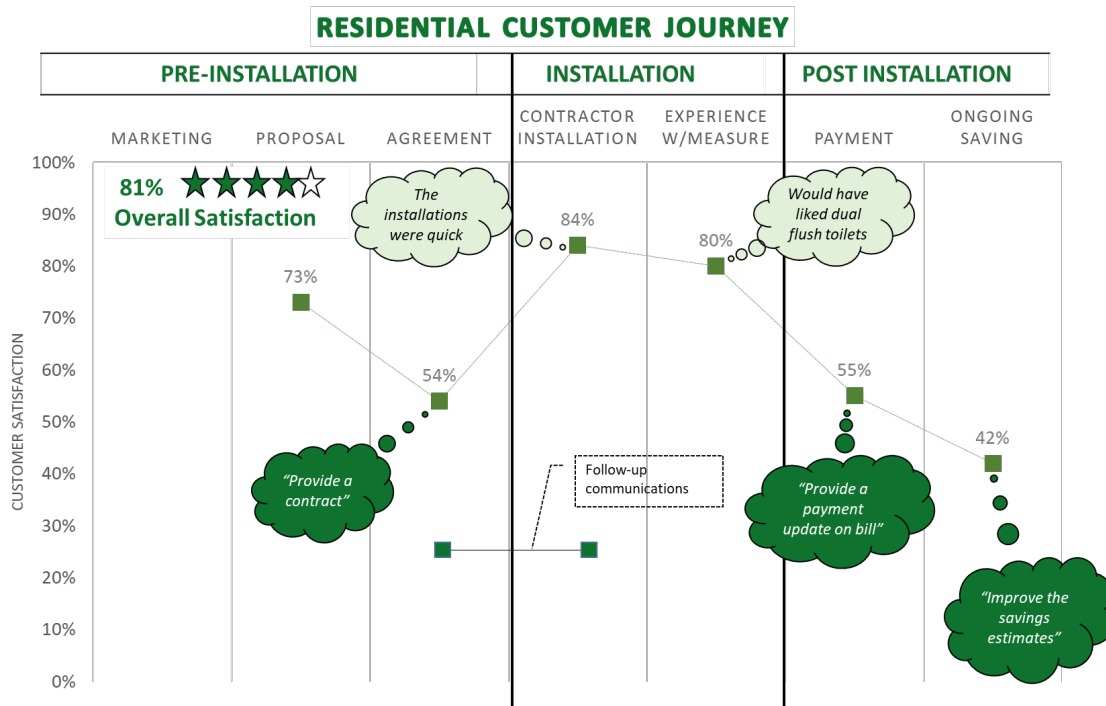
- The customer journey began with the *pre-installation stage*, when they learned about the program, discussed possible participation, and signed a participation agreement.
- Within *the installation stage*, the customer worked with a contractor to have the new measures (e.g., toilets, landscaping) installed.
- In the last part of their journey, the *post-installation stage*, the customer accrues savings, and then through an ongoing process, pays for the improvements and the installation work through their water bill.

Most residential participants are somewhat or extremely satisfied with their overall program experience (81%). These customers were generally pleased with the installation and savings; although many did offer additional feedback on their experience.

In addition, 87% of residential participants felt that other households should participate in the program, indicating a high level of satisfaction and value to customers.

¹⁹ Note that for multi-family customers, which are discussed in a separate chapter, the program targets building owners and operators (although the benefits also serve residential customers who live in the units).

Figure 3. Satisfaction with Program Components Across the Windsor Customer’s Journey



While the negative feedback was limited, negative comments generally were around the lack of savings, product issues (quality of product, specific installation requirements), and issues with landscaping. We discuss customer feedback by stage in the sections below.

Pre-Installation

For residential participants, their journey began with the *pre-installation stage*, when they learned about the program, discussed and considered possible participation, and signed a participation agreement.

Marketing

While the program was officially co-marketed by the town and the contractor, residential participants most frequently learned about the program through methods that they associate with town outreach. Most participants (69%) heard of the program through direct outreach, either a mailing, a water bill insert, or an email from the Town of Windsor. Word of mouth also played a large role for some; 22% of the Windsor single-family residential participants learned of the program through word of mouth. These avenues will be important for reaching future participants. Residential participants recognized the importance of marketing—49% believed that the initial hurdles of raising awareness and helping customers understand the program would be among the main reasons why other Windsor households would not participate.

Residential participants attribute saving water and saving money as the largest drivers of participation. Based on responses from 172 of the 231 Windsor participants immediately after they participated, *savings* (in some form) was self-reported as one of the primary reasons why 99% of the residential participants accepted the offer. For non-participants, savings alone were not enough to motivate them to enroll although some non-participants did subsequently install upgrades on their own. For those residential participants who used the program for landscaping (50 of the 231), some felt that the drought resistant lawn, and reduced maintenance of their lawn, was also a primary driver. (See Table 5.)

“Landscaping was the main reason I signed up, along with the toilet replacement....very impressed with the quality of toilets installed.”

“The lawn to drought tolerant yard was the most effective part of the program.”

Table 5. Main Reasons for Accepting Offer (from program database, multiple response)

General Area	Specific Area	N* (172)	% (out of 172)
Savings	Any type (details below)	171	99%
	Water	75	44%
	Money	53	31%
	General	40	23%
	Energy	3	2%
Lawn	Lower maintenance	19	11%
Other	Various	23	13%

*This is the number of people who provided feedback at the time that they signed up (of the total 231 participants).

The program appears to have appealed to moderate-income households—a specific demographic group targeted by other BayREN programs. Residential participant households are more solidly middle class than most. Over half (58%) of respondents have household incomes between \$48,000 and \$100,000 compared to about 30% in the population as a whole. On the lower end, only 7% of residential participants (based on survey respondents) had incomes under \$48,000 compared to about 25% of Windsor’s population who bring in under \$50,000. On the upper end, 35% of residential participants make over \$100,000, while close to half of Windsor’s population (47%) makes over \$100,000.

Proposal and Agreement

While water bill savings programs like PAYS® are generally more difficult to understand than a typical rebate program, most of the Windsor residential participants found the overall program offer easy to understand (71%). There was some variation, however, across the specific program components.


One of the program benefits described in early feedback (in 2013²⁰) as very important—that the surcharge would stop if the upgrades failed and were not repaired—was one of the program terms that was least likely to be understood by survey respondents. This program offers residential participants guaranteed performance, but not all participants understood this service. (See Figure 4.)

In addition, 28% (or 12 survey respondents) did not understand what is required if they sold their home, and another 22% somewhat understood this program term. Notably, our survey did not reach out to any of the 57 households (of the total 231 that participated) that have already moved or transitioned their accounts to new occupants—some of which had trouble because they were not aware of this program requirement, according to feedback from town officials (see additional discussion below on “Moveouts and Closed Out Charges”).

²⁰ Cadmus. 2013. *On Water Bill Pilot*. Regional Climate Protection Authority.

Figure 4. Understanding of Program Components

Least likely to have understood prior to participating



	Fully Understood	Did not Understand
Only 15% fully understood		
• That charges would stop if the upgrades failed and were not repaired	15%	55%
20 to 35% fully understood		
• The potential energy bill savings	20%	13%
• That savings would immediately exceed changes	27%	19%
• That charges would stop if you sold your home and disclosed participation to the buyer	31%	28%
• Program fees	36%	18%
Close to or more than 50% fully understood		
• The potential water bill savings	50%	2%
• That the homeowner is responsible for general maintenance and improvement of the program	58%	11%
• How program costs would show up on your bill	60%	13%
Most likely to have understood		

Source: Participant survey (n=45)

About 50 of the 172 who provided feedback at the time they participated mentioned some early concerns with the offer. These primarily centered around the overall cost of the program. There was some skepticism about whether they would really save — “will it be real.” Other concerns included the quality of the products in the program, specific plan options, and the length of time the surcharge would be on their bill.

Residential participants were generally very pleased with the offer; however, 75 did make suggestions that would have made the offer even more appealing to them. Unsurprisingly, many wanted fewer (or no) costs (24). Others also mentioned better product selection (12) or more plants (11), and a few (2) wanted options on payment length.

In addition, there were ten respondents of our survey (n=45) who wish they had received more information before they signed up, ranging from contract information (e.g., how many months to expect charges), to understanding the toilets, to more specifics on the warranty, to a more realistic savings estimate. Examples of comments included:

“Make sure that a contract is clear and understood and that the customers GETS A COPY!!!²¹”

[The respondent desired information on] “What I could expect in savings on my utility bill”

For many residential participants (86%, or 198 of 231), their proposals included measures that did not require a co-pay. Others (14% or 33) selected a measure, such as an appliance or recirculation pump, that required them to pay a co-pay upfront so that the cost-savings would pencil out within the chosen payback period. In addition, participants often received rebates from Windsor or PG&E as part of their package. In particular, landscaping work and appliances were eligible for rebates. As such, the full agreement with the customer was often a mix of both the PAYS® offer and other rebate programs, such as the Windsor landscaping or PG&E’s appliance rebate programs.

- **Measures without a Co-pay:** Five measures did not need any initial payments: high efficiency toilets, showerheads, faucet aerators, compact fluorescent light bulbs (CFLs), and drought-resistant landscaping.
 - All landscaping customers received a rebate from Windsor that averaged about \$2,000 (a low of \$574 and a high of \$9,243). No rebates were available for toilets.

²¹ We do not know if this customer received a copy of the program contract or not. This is their full written response to the question.

- **Measures with a Co-pay:** Three measures required a partial up-front payment. These included hot water recirculation pumps, refrigerators or clothes washers. These were measures that could not pay for themselves within the allotted timeframe.
 - Participants were eligible for a \$50 PG&E rebate that helped defray the cost of the clothes washer.

Follow-Up Communications

Even though there was high satisfaction with the overall program, communication issues cropped up during the customer journey. Follow-up communication (or lack of communication) was a low point for some residential participants. Only about one quarter of participants (26%) were extremely or somewhat satisfied with the timeliness or frequency of and methods used to communicate.²² (See Figure 3 above). Note that while some respondents may not remember the follow up, all residential participants were supposed to have been contacted (at least by phone) to confirm the installation of the measures.²³

- The more general comments around this issue were around lack of follow up communications
 - *"I do not recall having anyone contact us or coming back for a follow up."*
 - *"We did not have any follow up communications. We were not contacted after the installation of the various water saving and energy saving devices."*
- Participants also mentioned specific issues related to communications with the landscaping contractor.
 - *"I never got a call back for installation of low water plants after they came out and measured my front lawn".*
 - *"The landscaper was slow to respond initially. Hard to reach."*
 - *"Plants died, and contractor did not return calls requesting replacement."*
 - *"Lack of follow up by the landscape contractor after installation."*

From a participant perspective, this may be one area for program improvements (discussed more below).

Installation

Within *the installation stage*, 231 customers worked with contractors certified by the program to have the new improvements (e.g., toilets, landscaping) installed. Residents worked with different contractors depending on their package (Bottom Line Utility Solutions or Water Management Inc. for indoor plumbing services, Sonoma Mountain Landscape for irrigation and landscaping, and for some, an appliance contractor).

Contractor Installation

Residential participants were extremely or somewhat satisfied with the contractor who installed their measures (84%). Of two respondents that mentioned positive experiences, one said that they were surprised at how quickly the installations were completed.

Most residents (210 or 91%) had new toilets installed, about one quarter (50 or 21%) of residents chose to include landscaping, and 13% (31 accounts) chose to include a hot water recirculation pump. Very few installed appliances (10 accounts or 4%) or energy saving measures. (See Table 6.) More than a single measure could be installed, and so there are more toilets, showerheads, and faucet aerators than customers.

²² If we drop those that don't recall and look only at the valid percent, this represents 31% of those that gave a valid response.

²³ This follow up communication was conducted by the certification agent, Sonoma County Energy Independence Program (SCEIP).

Table 6. Number of Measures Installed

Water Measures						Electric Measures	
	Showerheads	Toilets	Faucet Aerators	Landscaping	Hot Water Recirculating Pump	CFL	Appliance
% of Customers	95%	91%	73%	22%	13%	3%	4%
N of Measures	358	371	452	50 (63,656 Sq Ft)	35	27	10

Notably, the program offered only one model of low-flow toilet and other measures. For example, they offered only one clothes washer model, in one color, which did not come with a dryer. According to the water district, this was a barrier for some residential participants.

Participants described only a couple of issues with improvements at the installation phase:

- One customer ordered an elongated toilet seat opening, but a round one showed up. (They chose to keep it so installation was not delayed.)
- One mentioned a hole being drilled in the front of their bathroom cabinet for the chilipepper recirculating pump, stating, if they had known that would occur they probably would have reconsidered the installation.

In general, however, satisfaction with the improvements and the installation process was very high.

Residential participants stated that the installation of these measures occurred mainly because of the program. Only a few respondents (4%) indicated they would have installed the same equipment within six months of when the program installed the equipment. Additionally, most people either would not have paid for and installed the measures (44%) or didn't know if they would have paid for and installed the measures (37%) without the program. As such, the program appears to be inducing changes among residential participants. Given the design of the program—where customers pay 100% of the cost, this type of program is not expected to lead to any free-ridership. This sentiment was supported by the Windsor water district, which indicated that they were able to install more toilets in two-years under the PAYS[®] program than they had in the five years prior.

Post-Installation

In the last part of their journey, the *post-installation stage*, the residential participant gains experience with the measures, accrues savings, and then through an ongoing process, pays for the measures and installation through their water bill.

Measure Experience

Most participants were happy with their improvements, but a few had suggestions to consider. The majority of the issues were around the landscaping or chilipepper on-demand recirculation pump measures (see bullets below).²⁴

- **Landscaping:** There were 16 survey respondents who participated in the landscaping component of the program and seven described difficulties. These ranged from lack of communication with the landscaping company, to plants dying, to poor ground cover resulting in many weeds.
- **Chilipepper:** There were eight survey respondents who installed the chilipepper product (an on-demand hot water recirculating pump) and for four of them, the pump failed and three removed the product.

²⁴ One respondent indicated a dislike of the clothes washer being chained in place.

- **Showerheads:** Participants removed showerheads more frequently than other measure. Of the 39 survey respondents with low-flow showerheads installed, 14 (36%) have removed them—seven because they disliked the low pressure, five because the showerheads broke, and two due to a remodel or simply decided to change to a different showerhead type.
- **Toilets:** One participant thought that they could be using more water with the new toilets because of the need to flush multiple times. One customer stated that the toilets no longer work like they did when initially installed and that they would have to replace them soon. And another would have preferred a dual flush option.

Some of these comments (those who indicated that the measures were removed) indicate that expected savings may be less than shown in the database.

The program may also have missed some opportunities because about half of the residential participants (53%) continue to indicate that they want additional water and/or energy savings measures (although notably our survey was conducted several years after initial participation). Most of these (24%) want LED or energy efficiency lighting, 15% want a lawn irrigation system, and another 13% want to replace additional toilets.

Expected Savings

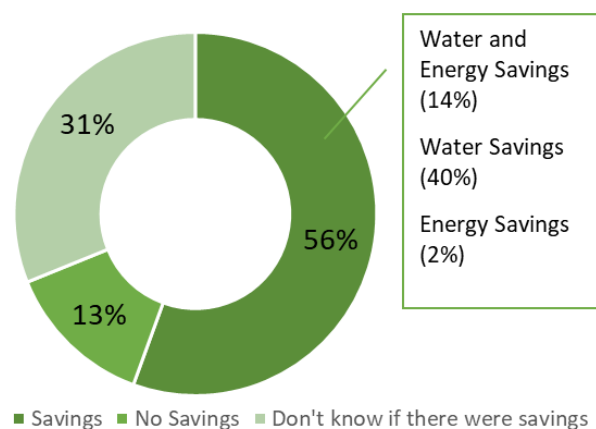
The program made improvements that led to an expected water savings for the Town of Windsor (based on modeled savings) of more than a half-million gallons of water per month (524,630 gal/month).²⁵ Modeled water savings from indoor measures made up about 35% of all water savings and landscaping captured the remaining 65% of savings.

At the time of our survey, residential participants had been in the post installation stage for four to five years. During this time, they have been experiencing savings and paying the surcharge on their bills. Additionally, about one-quarter (57) have moved or closed out their PAYS®-related surcharges (more information provided below).

Household Perspectives on Savings

Of the residential participants still making payments (174 active accounts provided by Windsor as of August 2018), we explored their perspectives on whether they were seeing savings. Slightly over half of the participants (56%) felt the improvements resulted in savings, another 31% weren't sure if they had savings, and 13% indicated no savings. (See Figure 5 below).

Figure 5. Self-reported Savings by Type of Savings



²⁵ Just to get a sense of this value, residents in the Town of Windsor used about 42 million gallons per month in August (the average residential household in Windsor used 44.5 gallons of water each day in August 2017 or about 1,380 gallons per month).

<http://projects.scpr.org/applications/monthly-water-use/town-of-windsor/>

Of the 31% who were not sure if they were getting any savings, all felt other households should participate. There were only a few participants who were extremely or somewhat dissatisfied with the overall program, and they indicated it was because they saw no overall savings or only energy savings.²⁶

Many of the residential participant households indicated they took additional water or energy saving actions in their homes. However, while many survey respondents (62%) described installing additional water and energy efficiency measures since the program (e.g., LED bulbs, appliances, irrigation), only one indicated that they did so because of (or related to) their participation in the PAYS® program. While our findings are based on a small number of self-reported responses, based on these comments, we would expect a very low level of participant spillover from the program.²⁷

Payments

Four survey respondents mentioned difficulty with their bill, either understanding it, knowing if they were saving anything, or indicating that their bill went up. One was unhappy with their ability to determine if savings were occurring and did not know when their program surcharge would end. Another stated: “I was told we would save at least \$50 a month. We haven't noticed much savings at all during the whole time we've been on the program.” One person suggested that the bill reflect the surcharge payments to date and what is still left to pay.

Specific customer recommendations were:

- *Better follow up and make sure [homes] benefit from improvements.*
- *Provide a payment update each month on the utility bill.*
- *Providing a better estimate for water/cost savings for program participation.*

While these suggestions would be desirable, they may not be practical or possible.

Moveouts and Closed Out Charges

As mentioned above, some of the residential participants no longer appear to be active participants. During the four to five years since the original customers enrolled in the PAYS® program, 57 accounts have either transferred to a new occupant or become inactive (25% of the original residential participants). Among the 57, it is clear that 41 of these successfully transitioned to a new occupant (i.e., the customer of record and the account number have changed but the account is still an active PAYS® participant). Sixteen (16) no longer have an active charge, so these may have either been paid off or unsuccessfully transitioned.²⁸

Those with inactive accounts were not part of the surveyed population, so we are unable to determine if these customers followed the disclosure requirements and transferred the payment to a new occupant, or if the PAYS® improvements had been paid off. However, among the surveyed customers a relatively equal percentage either fully understood (31%) or did not understand (28%) that they were “...responsible for disclosing ...installed Windsor Efficiency PAYS® [improvements] and their associated surcharge to the new resident.”

Future Participation (Single-Family Residential)

Targeting residential customers

²⁶ Customers with energy saving measures signed a form acknowledging that some, and perhaps most, of their savings may accrue on their energy bills

²⁷ Participant spillover refers to savings outside of what is tracked through the program. Ideally, evaluators would use a comparison group to determine spillover; however, based on the small number of residential participants and the unique characteristics of each building, this is not possible. Self-reported data is the best indicator available.

²⁸ The water district indicated that there were a few accounts that were unable to be transitioned. This is covered in more detail in a subsequent chapter.

According to the contractor, residential customers can be a good target because there is lots of interest and homeowners can make improvements through the program for no upfront cost. However, single-family residential is more difficult to manage because there is more cost/overhead per customer with less revenue per unit (that is, the contractor makes less money when dealing with single-family).

Marketing by town (or by water district) seems to be a good method of outreach—more so than marketing by the contractor—because the town is credible and its role as program sponsor appears to raise interest. However, about half of those surveyed thought that “lack of awareness” would be one of the main reasons why others would not participate. (Our study did not review the level and type of marketing.) Other potential barriers to program participation were described by only two or three people each and included the surcharge cost, lack of savings (or not believing there would be savings), and the time required to participate. These are areas that the program should consider as they move forward with any new efforts.

Program changes: Additional measures and measure changes

Overall, residential participants were satisfied with the program; however, the program may want to consider changing the type of showerheads since these were frequently replaced by participants. Given the number of showerhead removals, the program should review possible different showerheads that can cost effectively work within the program budget, yet still meet the low flow requirement (or adjust their savings estimates to account for a lower installation rate).

The Town of Windsor also expressed that they are considering simplifying the program by not offering the drought tolerant landscaping option. Close to half of the survey respondents thought that this would cause fewer people to participate. Perhaps more importantly, and despite the difficulties noted previously, half of the 16 respondents who participated in the landscaping component felt the same way (eight thought it would cause fewer people to participate, seven indicated they didn’t know, and one thought it would cause more people to participate). One person indicated that the landscaping was the main reason they signed up and another thought it was the most effective part of the program.

Specific customer recommendations around landscaping were:

- *Be sure that folks know that they can pay more for better weed barriers. The ones used by the program are not effective.*
- *Have staff available to evaluate landscaping water systems and educate homeowners on ways to improve efficiency of existing landscape water system. Information is key.*
- *The qualifications for the landscaping were confusing.*

The landscaping component of the program is a large energy saver (at least as estimated) and close to one-quarter of residential participants chose the landscaping option. However, most likely, part of the draw to participate was the additional landscaping incentive offered by the Town of Windsor. If those rebates are no longer available, uptake of the landscaping component may go down. Additionally, given the communication difficulties described, the program and Town of Windsor should carefully select any future organizations for landscaping, and should ensure follow ups (and QA/QC) with landscaping participants to ensure sufficient communication and an acceptable quality of the landscaping. The program should also consider what specific options are included to reduce any dissatisfaction with weed control.

Communications

Through the lens of ensuring and improving timeliness, frequency, and quality, the program should also review the multiple ways that they directly communicate with customers (or that program contractor’s communication with customers). After installation, when the program typically exits from ongoing communications with a customer, they can

continue with a positive level of communication by making it easier for the residential participant to understand how much they have paid and how much longer they will be paying. Additionally, if the program provides customers with a contract, in the post-installation stage the customer can then go back to details they might otherwise forget.²⁹

²⁹ This research was conducted multiple years after the single-family participants signed up, so we could not verify whether participants received a copy of their contract. They may not have remembered receiving a contract. An electronic version accessible through a portal could be an option in the future so that it is still available to them multiple years after signing up for the program.

The Program Journey: Stage-by-Stage through the Water Bill Savings Program

While many of the program elements are similar across the three programs, they have different funding sources, offer different measures, and chose different return-on-investment levels for customers. (See Table 1, page 3, for a description of the differences between the programs.) The organizations overseeing program administration also vary across water districts. BayREN recruited the three water districts and then tailored the program to the specific jurisdiction (represented by the first two boxes in Figure 6) so differences arose as BayREN customized the program to the individual water district.

Figure 6. Current Program Process



*Note that in the regional model, the program would be designed, and the capital would be secured prior to appealing to water districts, so this box would shift to the right.

**The second box is highlighted to emphasize that the program is designed after appealing to water districts.

BayREN is currently developing a regional Water Bill Savings Program (WBSP) that would remove some of the duplication of effort that occurs each time the program is re-designed for a jurisdiction, while reducing both the time and effort required to get a program launched within each water district.

In each section below, we describe BayREN’s proposal for the *regional* model (currently under development), and we compare this with the current process across the three existing programs (i.e., documentation of current processes). We also discuss the research findings for each of the areas as drawn from our review of materials and databases, in-depth interviews, and our online survey.

In the sections below, we walk through the main stages of a regional WBSP program. The order of the sections below is slightly different than the boxes above since the regional program would be designed (and the financing would be secured) prior to recruiting water districts. As such, the *Appealing to Water Districts* box in the figure above shifts to the right to become the third box. Specifically, the discussion for the regional program includes:

- Securing Capital and the Value Proposition Created by the Funding Mechanism (Association of Bay Area Governments [ABAG]/Program Designers)
- Administering Program Services (BayREN and Implementer)
- Appealing to Water Districts, and their Execution of Marketing and the On-Bill Surcharge (Partner Utilities or Water Districts)
- Installing Measures (Contractors)
- Participating (Single-family Residential and Multi-family Customers)

Securing Capital and the Value Proposition Created by the Funding Mechanism



In the regional model, water districts would not have to finance the program. “ABAG [would] oversee the program, facilitate access to capital and engage with the bond market when necessary.”³⁰ As such, ABAG would secure the capital and allow access to participating water districts and customers across BayREN’s counties. Surcharge payments by customers would go to repayment of the initial capital used to fund the project as well as to support program administration by the water district and program oversight by BayREN.

Existing Program Model

This is a different funding source from the existing local programs. Currently, all three programs are self-funded by the water districts—that is, each had to secure their own funding. The initial investment from internal funds made by the current partner utilities ranged from \$150,000 to \$4M across the three programs. While the funding source is different, the proposed WBSP split repayment mechanism is similar to what currently occurs in Windsor and Hayward.

- **Windsor funding:** Self-funded \$4M after looking for other alternatives (i.e., banks or private investors). It took two years to get the program going for Windsor PAYS®. PAYS® started up under the ARRA grant (which paid for the initial administrative support), with the funding for the projects coming directly from the town. Repayment includes a 7% fee with a 3% return to the General Government Capital Replacement Fund and 4% to the Water Utility Enterprise Fund for rate stabilization.
- **Hayward funding:** Self-funded \$1M from Hayward’s water fund after looking at other alternatives. Repayment includes a 6.95% fee that helps to pay for implementation and support the water district.
- **EBMUD funding:** Self-funded \$150,000 from their water conservation division fund. EBMUD includes a 4% program activity fee that goes back to EBMUD.

Findings Related to the Funding Mechanism

Self-funding of the program was difficult for some, but not for all water districts. Two of the jurisdictions (Windsor and EBMUD) found that it was easy to fund this effort, while one (Hayward) had difficulty. However, the need to self-fund contributed to the slow ramp up even when the internal process to select self-funding went smoothly.

- **Windsor:** The program was originally designed to be funded from private capital; however, when Windsor was starting their PAYS® program, they were also going through a rate study (and a drought) and recognized that there was a short-term revenue issue, which could cause the rates to go up an additional 1%-1.5% if they (successfully) reduced water use through the program. The program designers developed a model that would allow the program to reimburse the town and the water district the fees that participants would otherwise have paid to a private capital investor. Windsor invested the money and then split the 7% program fee into program-related cost and interest. One portion goes toward repayment of the capital with 3% interest and one portion to rate stabilization (4%). As such, it wasn’t as difficult to decide to invest their own funds because Windsor was able to make more money (return on investment, ROI) and stabilize rates if they put up the capital themselves. At the time, the alternative was to use private capital and end up with a rate increase (according to their rate update study). The process for getting approval and starting up the program took a long time.
- **EBMUD:** Self-funding was not an issue for EBMUD because they had the budget available from pool of funds allocated to rebates that were no longer being offered. The decision was made within the water conservation division. They recognized that a revolving fund model³¹ replenishes the funds and allows them to serve more customers. Because of this, it wasn’t difficult to decide to participate in the program, but it took time to get buy

³⁰ BayREN. 2018. *BayREN Water Bill Savings Program Framing Paper*. DRAFT VERSION October 2018.

³¹ In a revolving fund, participants pay back into the fund to replenish the initial capital. The fund is continually replenished as withdrawals are made.

in. While we did not collect specific information on the amount of time required to ramp up, EBMUD indicated that they “were considering for many years” before launching the program.

Hayward found that it was more difficult to fund this effort on their own.

- **Hayward:** Hayward wanted to go to a private bank but there were challenges. It was very difficult for them to get the \$1M allocated. At one point, they realized that in order for the city to get the unsecured loan they would need a vote of the people. Some staff were ready to give up, but Council members made the case for dedicating money from the water fund. According to Hayward, this process for getting approval and starting up the program took a long time.

As described above, based on interviews with the three programs, securing funding contributed to long startup times across all three programs.

The participating water districts expressed interest in a program that is regionally funded. According to BayREN, the regional program would focus on water districts that are already members of ABAG, (that is, they already have an established master service agreement with ABAG). Our research explored whether existing participants would participate in a *new* Joint Power Authority (JPA) (before ABAG made the decision to use the current JPA). For Hayward, if there were a JPA and regional funding, they felt that could be very useful since getting funding was difficult. However, the city council would still need to make the decision to participate. They would work first with the smaller sustainability group, and then bring the decision to the larger council. EBMUD indicated that they might still consider being part of a JPA if one were developed (even though getting funding was easy for them), but it might be a long process for them to get approval to participate through a JPA. They would consider the benefits and drawbacks of this model. These findings indicate the use of the existing JPA, rather than a new JPA, would help shorten the approval process. Note that the current report interviewed only participating water districts, which may be different from potential future participants.

While the funding source would be different, as mentioned above, a similar split incentive mechanism could be retained. The current funding mechanism helps encourage participation by providing a financial incentive to water districts. Overall, there is concern that, as with any water saving program, a water district might see high water reductions that cause them to raise rates. The PAYS[®]-type funding mechanism is structured to overcome this barrier. Under this type of a model, the return is split between covering the cost of capital (which according to participating water districts is generally better than some of their other investments) and supporting water district initiatives.

According to BayREN, the goal is to have a financially self-sustaining model³² after the program is up and running; however, it is unclear whether the program could get to a place where the funds are self-sustaining. For the existing programs, program development and administration costs were first covered by initial ARRA funding. Now, much of the program has already been designed. Single-family or multi-family participant surcharges include a one-time program operation fee to support program administration. In addition, CPUC funds support technical assistance for the partner utilities. Moving forward, the program model appears to draw on these ratepayer funds (distributed with CPUC oversight) for activities such as onboarding new utilities and the cost of required reporting. Thus, the majority of the program appears to be self-sustaining (i.e., funding for the improvements) but they would require that there are enough projects moving through the program to contribute to administration costs. There is also a part of the program administration that would not be self-sustaining (i.e., onboarding and technical support to partner water districts).

³² The details of the program will be worked out as the program is developed.

Administering Program Services: BayREN/Implementer



In the regional model, BayREN would serve as the regional implementer of the program to efficiently administer the program across the BayREN counties. As stated in the BayREN paper that frames the program, “Centralized program administration and operation allows Bay Area communities to benefit from water conservation without water utilities having to grow staff.”³³ In this role, BayREN would operate the program on behalf of the partner utilities (and their local water districts). This would include promoting the program to municipal water utilities, recruiting and on-boarding these utilities, providing technical support to utilities (as needed), and coordinating program operations. Coordination of the program includes: enrolling contractors; providing contractors with information about the tools and overseeing contractors; serving as the agent (or securing an agent) to make sure that the warranty is covered and that the contractor goes back when needed; reporting on-bill surcharge to water utilities; and coordinating data collection. BayREN would also develop marketing that triggers customers to call the program

and request services (although water utilities would help to market by providing this information to their customers).

Existing Program Model

Currently, the implementation role is played by different organizations across the three programs:

- **Windsor implementation:** For Windsor, the County of Sonoma Energy and Sustainability Division (ESD)—formerly the Sonoma County Energy Independence Program—acted at the program implementer and agent for the water district, with support by BayREN.
- **Hayward implementation:** In Hayward, Frontier Energy, Inc., retained by Hayward because of its experience working with BayREN to develop the program, plays the role of the program implementer.
- **EBMUD implementation:** For EBMUD, the implementation is done in-house by the water district.

Findings Related to Program Administration

BayREN is a looked-to resource that provides value to the water districts. Based on comments from Windsor, Hayward, and EBMUD, BayREN support is great. The water districts report that the BayREN team is “always responsive, helpful and able to work through issues.”

BayREN as the implementer has the ability to quickly draw on lessons learned and adapt the program to the needs of the market; however, the three participating water districts were unique in what they wanted to offer. For example, EBMUD focused only on water since they are a water retailer, while Windsor was willing to fund both water and energy saving devices since it supports overall town greenhouse gas and sustainability goals. If water districts feel that they have different needs, some of the envisioned regional efficiencies may not materialize.

Based on our findings, there is a good foundation for a regional effort. Through the development of the three programs, most of the systems and processes have been established and updated or improved based on learnings to date. For example, EBMUD stated that their process for getting up and running would have been slower without BayREN. BayREN shared insights and materials with them, helped set up program processes, and developed measure screens that determine whether customers are a good fit. In addition, the EBMUD program would have been even less consistent with other programs without guidance from BayREN.

³³ BayREN. 2018. *BayREN Water Bill Savings Program Framing Paper*. DRAFT VERSION October 2018.

Appealing to Water Districts, and their Execution of Marketing and the On-Bill Surcharge: Partner Utilities (or Water Districts)



In the regional model, the water districts would be instrumental in offering the program to their customers and supporting program implementation by marketing and executing the on-bill surcharge. The districts would need to establish a tariff that allows them to recover the surcharge, verify customer eligibility, and adjust their billing systems to support repayment processes. Adjusting their billing systems includes placing a line-item on-bill surcharge on the bill, tracking and collecting the on-bill surcharges, issuing repayments to ABAG and transferring customer accounts if needed. They would also help with marketing by distributing program-developed materials.

Existing Program Model

This is a reduced role from the current model, since all districts currently also finance their programs, and EBMUD fully implements their program.

- **Windsor role:** Windsor was the primary marketer of the program (although officially the program is co-marketed by the water district and the contractor). Our research did not collect any information on the on-bill surcharge process; however, a prior study found that “the water utility asked its third-party billing provider to add the surcharge [including the associated functionality including per-gallon-billing and program accounting] and the cost (\$37,050) to make the change was fairly expensive relative to the size of the utility (Cadmus, no year).”
- **Hayward role:** Hayward does some marketing of the program (e.g., testimonials from past participants). Hayward has also adapted their billing system to accommodate the surcharge. (No additional details were available.)
- **EBMUD role:** EBMUD adapted their billing to accommodate the surcharge. They also market the program, although they treat the program as a customizable program (where the participant can decide their payback period and percentage) in a portfolio of other offerings to their customers. (See the Introduction and Background for an overview of the EBMUD program.)

Findings Related to Recruiting Water Districts

According to the water districts, there are two main benefits of the PAYS/WBSP program: saving water and engaging customers (which may be more important for some water districts).

- **Conservation/water savings**
 - Windsor and Hayward participated because they wanted to reduce water use to support GHG or sustainability goals.
 - EBMUD has a water conservation action plan that echoes / the state requirements in SBX7-7, and they are on target to meet their goals. Water savings don’t appear to be the biggest driver for EBMUD since they are on track to meet goals even in the absence of the program.
- **Engaging customers**
 - Windsor indicated that this program helped them significantly increase the number of participants in their water conservation programs. They were able to get more toilets retrofit in 2 years (under the PAYS® program) than they had in the prior 5 years with other programs.
 - EBMUD sees this as one tool in the tool box to engage customers. They also leverage their customer contacts on this program for other programs. As such, even if a multi-family owner is not interested in participating in the on-water-bill finance program, the program provides good leads for other programs;

EBMUD indicated that since launching its on-water-bill program they have also had “considerable uptake in other programs, such as the multi-family property audits, as well as in their custom rebates.”

- EBMUD reported that they are moving away from rebates and providing individual funding for individual fixtures. The on-water-bill program is a way to provide assistance without being too narrow or giving away money. According to EBMUD, they see this program as a “next generation rebate program.”
- EBMUD also mentioned that this program can help address issues around the affordability of water. They state that this program can help them serve disadvantaged communities as well as the broader community, since their goal is to make sure that they maintain affordable rates and that healthy water is accessible for everyone.

Participating water districts are happy with the program and state that the program does not require significant resources for them to implement the requested activities. As mentioned above, the three water districts struggled with the decision to participate because of the funding, but they indicated that after they signed up, the requirements on the water district are not too resource intensive. Windsor mentioned that the requirements on the water district come in waves when participants are enrolled, but that the program implementer really helps see everything through. Hayward indicated that they get some questions about the projects which are handled by the implementer or the contractor, although Hayward signs off on final projects.

Marketing by the water districts has been successful. Marketing is also generally aligned with other marketing done by the water districts. Participant (and near participant) feedback indicated that the water districts (or city/town) lent credibility to the offer. Based on findings from participants, promotion is a good role for water districts. Participants (and near participants) also indicated that they learned about the program from the water districts, speaking to some success of past marketing efforts.

There were some challenges in the startup and implementation of the program within the water districts. The challenges included: (1) being able to work with billing system and add the surcharge to the bill; (2) working with legal teams and risk management divisions; and (3) for some, developing a good process for transitioning customers who move out of participating buildings.

- *Adding surcharge to bills.* The water districts saw challenges in adding the surcharge to the bill because there’s not a lot of flexibility in the districts’ existing billing systems. It also requires the coordination of several people or groups within a water district to implement. It appears to be a one-time manual process to add the surcharge to each participating customer account (that is, to get it set up). The monthly billing for each individual account is then automated. For Hayward, the challenge of adding the surcharge to the bill was second to getting funding.
- *Working with legal teams and risk management divisions.* The water districts indicated that future water district participants should give themselves time to work with these groups because it took some time work through issues with legal and risk management. Moreover, some of the water districts indicated that it is a difficult process to understand, so they needed to explain it multiple times to internal stakeholders. Water districts felt that the program is more complex than a standard rebate program and thus was “hard to socialize” (i.e., difficult to explain) among the key stakeholders.
- *Ensuring successor customers are aware of program benefits and obligations.* The multi-family programs have not seen much transition of the accounts to new owners or occupants; however, Windsor’s single family (SF) residential program has transitioned 57 accounts. Of these, 41 appear to have successfully transitioned, while 16 have been paid off or gone into default. According to Windsor, program succession for SF customers has been an issue because participants that sell their houses haven’t always remembered to disclose the PAYS® obligation. There have been a few participants who have defaulted (that is, the utility had to absorb the outstanding obligation). Windsor is currently not offering the program to new customers because of this challenge, but they are actively working to amend the process so that it works. Specifically, they are working to make the agreement a “recorded document on the property/title” but the process has been taking time since it

had to go through their legal team. Note that based on a literature review of other PAYS® programs (see Appendix C), we would expect low default rates.

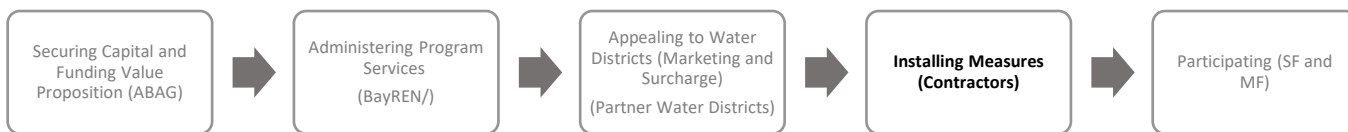
As the WBSP program appeals to new water districts, they may find that water districts feel that current rebates are sufficient for meeting their water conservation goals (described under the *Context for the Future* section in the introduction). There is some evidence in the past evaluation (which explored participation with non-participating water districts) that some water districts felt that existing rebate programs were sufficient (so this program was not needed). These existing rebate programs are offered through a variety of different agencies and may be a bit patchworked over the BayREN counties, but include the following:

- The Bay Area Water Supply and Conservation Agency (see BAWSCA.org) offers rebates for toilets, lawn replacement, and sprinkler nozzles in Hayward and other BAWSCA regions, which don't fully overlap with BayREN's counties.
- Windsor offers a Water Efficient Landscapes (WEL) Rebate Program for the removal of turf grass or for the purchase of lawn sprinkler equipment upgrades that improve the efficiency of the existing irrigation systems. They no longer offer rebates for plumbing fixtures.
- EBMUD offers a wide variety of conservation programs, including: rebate and other support programs, such as a landscaping rebate program (based on square footage); customized rebates (for equipment); giveaways for showerheads and aerators; several outreach type programs; and audit programs.

In addition, all of the participating water districts indicated that they were able to meet their goals even without the current program. Specifically, information on the state website that captured Urban Water Management Plans (https://wuedata.water.ca.gov/uwmp_export.asp) has data showing that the water suppliers in the North Central region (which includes the Bay Area) have met their conservation targets for 2016 and Bay Area suppliers appear to have already met their 2020 targets. However, there is strong support for water-energy nexus programs within the legislature, at the CPUC, and among regional stakeholders.

Finally, the fractured nature of water districts and lack of Advance Metering Infrastructure (AMI) meters could also limit participation by water districts. Water rates can vary by area. In areas where water is less expensive, the improvements may not be cost effective. In addition, not all water districts have AMI meters. When a water district is billing residential customers in 100 cubic feet (ccf) and not gallons, the billing unit may not be granular enough to show savings to single-family customers on a monthly or bi-monthly basis. (This is not true for multi-family buildings where there is usually one meter with more water use and the savings that are large enough to be seen in ccfs). As water districts update meters to ones that can track on a single-gallon basis there may be more opportunities to expand the program. Hayward, for example, does not currently offer a SF program because they don't have AMI meters. They have been working to switch over to AMI for a year and had hoped to be done soon. According to one water district, only half of the water districts in the Bay Area currently have AMI meters.

Installing Measures: Contractors



The regional program intends to use multiple contractors to serve customers across BayREN counties. Contractors would participate in training and agree to abide by the program terms (including dispute resolution and bonding to reduce risk for participants and utilities), install approved improvements for eligible customers and complete all required forms, and participate in QA/QC activities as needed. Contractors would also need to pay prevailing wage to labor, at least for a multi-family program.³⁴

Note that BayREN is also considering expanding the role of the Program Operator to sell the job and get a contract signed, rather than the contractor. This approach would support consistent and timely communication of program benefits and focus contractor time on the technical tasks of measure installation.

Existing Program Model

The use of multiple contractors (to serve a larger number of customers) could be a big shift in the program. One water district (Windsor) does have experience using multiple contractors and the other two are open to multiple contractors; but across the three programs, one contractor (Bottom Line Utility Solutions) has completed nearly all of the projects.

- **Windsor contractor model:** There were multiple contractors in Windsor during the 2013-2014 period. In Windsor, Bottom Line Utility Solutions installed the majority of interior plumbing measures for both single-family residential and multi-family participants, Water Management Inc. (WMI) installed some measures, and there was an appliance contractor who pulled out of the program after one year. A different contractor, Sonoma Mountain Landscape, installed irrigation and landscape-related measures. If the participant chose a package with multiple types of measures, the Windsor program required the people to complete the Bottom Line (or WMI) services *before* handing off to an appliance or irrigation contractor. Bottom Line Utility Solutions installed all of the multi-family measures.
- **Hayward and EBMUD contractor model:** Both Hayward and EBMUD allow customers to use their own contractors—however, to date, Bottom Line Utility Solutions is the only contractor being used in these areas

Findings Related to Contractors

The program (as currently structured) may appeal to a certain type of contractor who is not a typical contractor. The current contractor, Bottom Line Utility Solutions, describes themselves as a production retrofit company. They are not a typical plumber or electrical contractor. They offer plumbing services, irrigation services, and also have an electrical license. They work on several utility and government programs with a focus on multi-family buildings. This means that they have experience with prevailing wages for contractors. As such, the current contractor is somewhat unique—closer to an implementer than a traditional plumbing or electrical contractor.

The program can provide value to contractors, but the program may find it difficult to *recruit* new contractors. The current contractor is participating because the program model aligns with their core business. They feel that the program can help them grow their business because it helps legitimize them in the eyes of the customers. The contractor mentioned that they carry a letter from the program that helps provide credibility. However, there is currently only one contractor serving these three jurisdictions, even though EBMUD and Hayward are open to all contractors that can meet the program requirements around insurance, bonding, wage requirements, etc. Contractor

³⁴ The program is currently exploring whether the prevailing wage requirement will apply to single-family residential jobs.

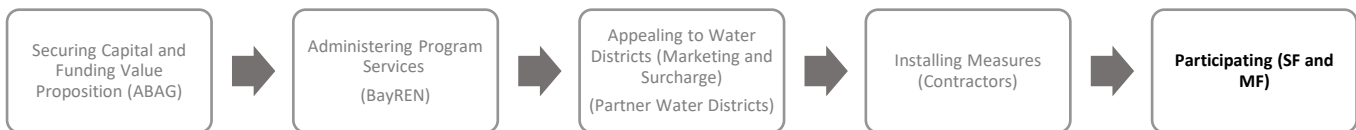
participation requires an agreement between the program (or water district) and the contractor. As mentioned above, there had been multiple contractors in the Windsor program, but a couple of these contractors are no longer interested in the program. EBMUD indicated that BayREN has helped them identify contractors that may be a good fit. Specifically, BayREN identified Public Works contractors that were familiar with prevailing wages. EBMUD indicated that they have attempted to talk to contractors but there still has been no uptake by these contractors. The main barrier for the contractors, according to EBMUD, is the prevailing wage requirement. According to EBMUD, some contractors have also expressed that they are interested in working with the program but that they haven't had time because it is more complicated than other programs.

The program requirements mean that contractors don't just casually participate. Participating contractors need to go through training, and according to the contractor and the water districts, the training is more difficult than with a standard direct install program where there is just one form. EBMUD is working to make participation simpler for contractors by moving their agreement to a digital platform. EBMUD also did a review of the agreement and they are in the process of shortening it.

There are also high acquisition costs for contractors to acquire new customers. This type of a program requires more relationship building (multiple contacts) than other programs. This can result in a high-acquisition cost for each customer. According to the contractor, this cost may be particularly high for single-family homes relative to the money that is made by contractors for each single-family participant.

Finally, there may be other challenges to this contractor model that should be considered. Notably, EBMUD mentioned that with a customer choice model, the water district does not have the ability to negotiate with the contractor as much as they would if the contractor worked directly for the water district.

Participating: Reaching Single-Family Residential and Multi-Family Customers



In a regional program, single-family and multi-family buildings would be able to participate. Participants would agree to program terms, receive improvements, and pay an on-bill surcharge including fees for cost of capital and administration. They would also participate in monitoring and verification (M&V) activities. The customers would make improvements that deliver more savings than the surcharge; that is, the monthly surcharge would not exceed 80% of the estimated monthly utility bill savings (water, sewer, natural gas and electricity).³⁵ The term would be capped at 10 years but may be less.³⁶

Existing Program Model

Currently, all three water districts target multi-family but only Windsor offered the program to single-family residential customers. Additionally, one of the water districts (EBMUD) has chosen to offer their customers *options* in terms of the ROI for the customer (while the other two have an 80% requirement). EBMUD's pilot requires that all improvements pay back the initial investment within a five-year period (rather than 10 as mentioned above). All other customer requirements in the current programs seem generally consistent with the proposal for the regional program.

³⁵ BayREN. 2018. *BayREN Water Bill Savings Program Framing Paper*. DRAFT VERSION October 2018.

³⁶ Materials and costs that exceed the 80% over the 10-year term would still be eligible with a co-pay, that is, they could pay down the upfront cost so that the payback on the remaining costs fits within a 10-year term.

Findings from Participants

The current programs are leading to customer changes that may otherwise not have occurred, and for some multi-family owners, it is accelerating the rate of adoption. Participant feedback indicated that the programs are saving water. While there wasn't a big indication of a spillover effect from the Windsor or Hayward programs, EBMUD reported that their on-water-bill efforts have led to significant changes outside of their on-water-bill program because they use the program as part of a larger portfolio of offerings. Some of their discussions about their on-water-bill program have led to participation in other programs. While they have only three participants in the on-water-bill program, EBMUD estimates that about half of the contacts made through this program have led to some changes.

Water savings are the largest driver of participation. The benefits of the PAYS®/WBSP program include water savings and reduced utility costs. Other benefits don't appear to be as visible to customers: according to some near and current customers, no-cost isn't really seen as no-cost; and neither the transition of the cost to a successor, nor the warranties/guarantees appear to be viewed as a huge benefit. We note, however, that immediately after participating, many *single-family participants* indicated that the fact that the obligation ends if they moved was important—but less important than other factors (see Figure 6 in the Cadmus report, 2013).

While the findings demonstrate that this program can have a big effect for some multi-family owners, it is difficult to find the specific multi-family owners who would benefit. Not everyone is a good fit. For toilets and some other improvements, it might be hard to find customers who need this program because buildings are upgrading/installing more efficient measures because of legislative mandates or the desire to meet tenant needs. Some geographic areas may have newer developments or newer irrigation systems that won't benefit as much. One multi-family respondent also mentioned that there may be external factors that discourage participation by multi-family owners (such as state or federal low-income programs that require a certain income baseline to qualify for funding). Moreover, some customers still view this as a loan-type program and don't feel that they need the loan. Based on a literature review of other PAYS® programs in other areas of the county, there is not much evidence showing the ability of this program model to scale. Based on a review of similar programs, Kansas has the largest target population, and appeared to reach 1,915 participants over 10 years. (See Appendix C.)

Notably, multi-family buildings also have access to energy efficiency programs that support some of the same improvements. Both PG&E and MCE offer programs that support multi-family measures that save water and energy. Neither PG&E nor MCE, however, offer similar measures for single-family residential customers. As such, some measures (such as aerators and low-flow showerheads) may be available, but measures for toilets and other water saving measures may not be available to single-family residential customers through other rebate programs.

Other programs available for similar improvements in multi-family buildings include:

- PG&E
 - Multi-family – Has multiple measures available for incentives, including irrigation controllers, turf replacement, low-flow toilets (these three are new in 2018), showerheads and aerators. https://multifamilyupgrade.files.wordpress.com/2018/09/mup_2018ownerfactsheet_2018.pdf
 - On-bill financing (OBF) is available for 0% interest on loans between \$5,000 and \$100,000 with five--year repayment (can use with multi-family but does not appear to apply to any cold water related measures). https://www.pge.com/includes/docs/pdfs/mybusiness/energysavingsrebates/rebatesincentives/taxcredit/obillfinancing/fs_obf.pdf.
- MCE
 - Multi-family – No predetermined measures for rebates. Measures are based on the free assessment. Customers have to pay a “good-faith” deposit (\$300-\$500 that they get back.) The MCE team of professionals will install weatherization measures including low-flow showerheads, faucet aerators, LED lightbulbs and in some cases hot water pipe insulation in tenant units, if the site provides access to at least

50% of the tenant units. <https://www.mcecleanenergy.org/wp-content/uploads/2018/06/MCE-Multifamily-Energy-Efficiency-Program-FAQs-2018.pdf>

- MCE does not have a financing offering but provides links to Go Green Financing and PACE. The Go Green Financing page includes a link for Hayward PAYS®.

Given the availability of the programs above, in multi-family buildings, there appear to be programs that allow for the installation of most of the same measures supported by the BayREN program (with the exception of toilets in MCE territory). However, there are certain markets that haven't been penetrated by these existing programs. BayREN's regional Water Bill Savings Program seeks to reach markets that have not already been served by typical program offerings.

In the next section, we present a regional model that is supported by the findings in this section.

Summary of Findings and Recommendations

Based on the findings in this report, the three current or existing programs offer several benefits to customers, contractors, and water districts, but these groups have also encountered some challenges. The existing programs' strengths and challenges are listed in Figure 7. Both the strengths and the challenges help to inform the regional program effort. We note that some of the challenges with the three existing programs will be overcome in the proposed regional model (discussed in the next section). The findings from this research effort indicate that there is a good foundation for a future regional program.

Figure 7. Summary of Strengths and Challenges of the Three Existing Programs

	Strengths	Challenges
Water Districts	<ul style="list-style-type: none"> • Can help support water conservation goals. • Can lead to active engagement with customers. • Seen as “next generation rebates” by one water district because it allows for customization and flexibility; can allow for more projects; and can target those most in need. • Requires active engagement of water districts that could result in long-term, self-sustaining efforts. 	<ul style="list-style-type: none"> • Difficult for some districts to get funding. • Takes time to socialize the program, i.e., explain the program to legal and risk management departments and working with internal stakeholders. • Difficult to establish tariff and incorporate surcharge and might not be worth it unless there are a large number of projects. • Issues around successor customers who take occupancy and new service at a location with remaining charges. May result in projects that are not paid off as demonstrated by the SF residential experience in Windsor; some SF accounts were written off.
Contractors	<ul style="list-style-type: none"> • Provides credibility and legitimizes contractors in the eyes of the customers, which may help contractors get additional business. 	<ul style="list-style-type: none"> • May require unique skills, such as being multi-disciplinary and having the ability to deal with program requirements such as prevailing wages. • Difficult for contractors to quickly understand. • Training takes more time than for a rebate program.
Customers	<ul style="list-style-type: none"> • Offer is appealing to customers. • High levels of participant satisfaction and findings indicate that the program encouraged savings that would otherwise not have occurred. • Able to reach MF customers and penetrate markets that otherwise had not been penetrated. • Not just one transaction—a long-term relationship that <i>could</i> be leveraged in the future (although this is not currently being leveraged under the existing programs). 	<ul style="list-style-type: none"> • The unique offering may be challenging to convey, and ways to enhance customer understanding (which require building a relationship) need to be employed. • Paperwork can be lengthy. • Building owners may think it will be less expensive to install improvements on their own. • For MF, market rate customers may have issues with adding the surcharge to the property. • Transfer process to SF residential successor customers wasn't always fulfilled.

Program Theory and Logic: Regional Program

Drawing on the findings around the strengths *and the challenges* of the existing programs, we present a regional program theory and logic model, as well as recommendations for how to best support the regional program in the future. The regional model below was developed collaboratively with BayREN.

Based on our findings, the theory in support of a future regional program is that:

- ABAG's regional fund (i.e., ABAG creates a line of credit, aggregates debt, issues bonds) will provide easy access to capital that will lead to easier opt-in for water districts because they won't need to go through the process (or the significant amount of extra time) to secure funding on their own. This will help with decision making and can speed up the process of participation. In addition, the continuation of a split of the fee (between the capital fund and the water district) will make the program more attractive to water districts to help to encourage their participation.
- BayREN as the solitary implementer will lead to regional consistency and economies of scale. Using a regional implementer will lead to efficient delivery of services.
- Water districts and their cities/towns will offer WBSP (including supporting marketing and adding the surcharge to the bill) because it broadens offerings already available to their customers (while not requiring too much on the part of the water district), and because it may appeal to a particular segment of the population not fully served through their other offerings (e.g., rebate offerings). Their participation includes marketing and updating their billing systems.
- Contractors will participate in WBSP because they like having options to offer their customers and because the program can give the contractors credibility. To serve both the multi-family and single-family residential sector, the contractors will need to both be able to handle small-scale jobs at individual homes, as well as quickly install measures (potentially water and electrical) in multi-family facilities. In addition, if the regional program also offers outdoor measures, they would ideally be skilled with irrigation systems and have qualified licensed landscaped contractors.
- Single-family residential customers and multi-family owners will participate (once educated) because the water district (or municipality) is credible and offers them a way to save water (which is the biggest appeal) and energy with no upfront cost. This program will accelerate the adoption of some measures (e.g., when code changes are coming) by helping customers install these measures prior to mandated deadlines.

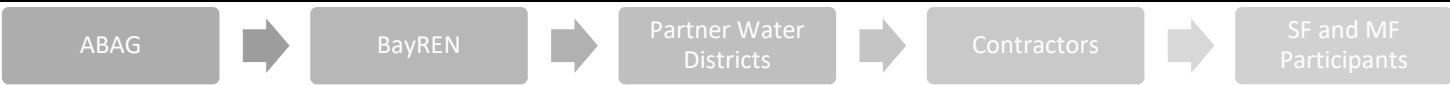
In the logic model below, we provide a short version of the theory described above, as well as a brief description of the role and activities of each of the key actors. We also provide outputs and outcomes that can be evaluated as the program is developed and implemented.

Logic Model for a Regional Program

(See model on the next page.)

External Factors: SB 546; Greenhouse gas policies: SB350, AB32, SB32; Water conservation policies: B-29-15; SBX7-7, SB407; Efforts from other PAs (no duplication of efforts); Business Plan and 3P decisions; Prior experience with PAYS® programs; Stakeholders; DWR and CPUC

Actors and Theory



ABAG: ABAG’s creation of a regional fund (by creating a line of credit, aggregating debt, issues bonds) will provide easy access to capital that will lead to easier opt-in for water districts because they won’t need to go through the process (or the significant amount of extra time) to secure funding on their own.

BayREN: BayREN’s centralization of the implementation role will lead to regional consistency and economies of scale (i.e., more bang for the buck).

Partner Water Districts: Water districts will offer the WBSP because it broadens the offerings already available to customers (while not requiring too much on the part of the water district) and may appeal to a particular segment of the population not served fully through their other offerings (e.g., rebate offerings).

Contractors: Contractors will participate in the WBSP because they like having options to offer their customers and because the program can give the contractor credibility.

SF and MF Participants:
Customers will participate (once educated) because the water district is credible and offers them a way to save water with no upfront costs that will translate into energy savings.

Role and Activities

ABAG (Regional Fund)	BayREN	Partner Water Districts	Contractors	SF and MF Participants
Oversee the program, facilitate access to capital and engage with the bond market when necessary.	Promote the program to municipal water utilities, recruit and on-board utilities, provide technical support to utilities (as needed), and coordinate program operations.* Develop marketing collateral.	Offer program to customers, and support implementation by marketing and executing the on-bill surcharge. Establish a tariff that allows them to recover the surcharge, verify customer eligibility, and adjust their billing systems to support repayment processes.	Participate in training and agree to abide by the program terms, install approved improvements for eligible customers and complete all required forms, and participate in QA/QC activities as needed.	Agree to program terms, receive improvements, pay on-bill charge including fees for cost of capital and administration, and participate in M&V activities.

*Coordination of the program includes: enrolling contractors; providing contractors with information about the tools and overseeing contractors; serving as the agent (or securing an agent) to make sure that the warranty is covered, and that the contractor goes back when needed; reporting on-bill charge to utilities; coordinating data collection and developing marketing collateral.

Outputs

<ul style="list-style-type: none"> Regional fund Number of projects and funds dispersed 	<ul style="list-style-type: none"> # of projects per \$ for program admin Total (energy and water) savings per \$ for admin funds # and type of marketing collateral Program website 	<ul style="list-style-type: none"> # Partner water districts offering WBSP # of water district marketing efforts 	<ul style="list-style-type: none"> # Active contractors with expanded sales tools (i.e., WBSP offering) 	<ul style="list-style-type: none"> # Participating customers (and makeup or types of customers served, track active and fully paid details) # Projects (and measures) \$ and % of debt not paid
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Outcomes

<ul style="list-style-type: none"> Self-sustaining (or partially self-sustaining) fund is actively used 	<ul style="list-style-type: none"> Program grows cost-effectively 	<ul style="list-style-type: none"> Satisfied water districts, i.e., water districts see value and continue to offer program 	<ul style="list-style-type: none"> Satisfied contractors, i.e., contractors see value and continue to offer program Quality installations High measure in-service rates 	<ul style="list-style-type: none"> Satisfied participants Low default rates Cost-effective water and energy savings Reduced water and wastewater Integration of water and energy services
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While much of the model above is based on findings from this research, the model will need to be tested in future research efforts, specifically through interviews with potential future participants.

Recommendations

Below we present recommendations to help overcome the challenges.

Recommendations for the Program

As summarized above, there have been some challenges for water districts, contractors, and participants in the current programs. The regional program will need to work to overcome these challenges. Based on the findings above, we recommend that the program consider the following.

To overcome the challenges for water districts:

- The program should develop guidance and case studies to help water districts maneuver through the issues that they see as barriers, such as the process of establishing tariffs (if needed), adding the surcharge to the water bill, and/or working with internal stakeholders. The program should also enhance the current guidance for how to deal with transferability between customers (based on Windsor's experience). Additional research may also be able to help provide information on what would help overcome water district barriers (see below).

To help overcome the issues around finding and appealing to customers:

- The program should continue to work with the water districts (specifically the city or town) to market the program because customers perceive the water district to be a trusted source of information. Water districts (i.e., the town or city) often have common objective of meeting a sustainability or conservation goal. BayREN and the contractor should also play a role in the marketing of the program.
- The program should screen for and target customer types who are a good fit for a water-bill savings program. This program can have a big effect for the right types of customers. Screening and targeting can help the program identify those in need of efficiency improvements. The best candidates will be those who currently have inefficient equipment, are unlikely to invest on their own, and envision themselves to be longer-term holders of a property.
- When looking for ways to extend its reach, the program may also want to explore marketing and outreach partnerships with new community choice energy programs (run by some of the Community Choice Aggregators) since they will be making a concerted effort to reach out to customers and may be able to help identify customers who would be a good fit for the program.

To ensure that the program is successful in working with contractors:

- The program should consider the option of working directly with a few contractors that can meet the needs of the program, rather than relying on a customer choice model. The findings suggest that it may take a specific type of contractor (one with experience with prevailing wage and other unique and multi-faceted skillsets). While we propose a plausible theory for why contractors may participate, the theory could fail if the specific types of contractors needed do not exist. Moreover, the theory behind the customer choice contractor model (that customers will prefer to work with their own contractors and so those contractors will participate) may be flawed if contractors aren't willing to go through the requirements of the program. Additional thought may need to go into how multiple contractors would work together to complete jobs.

To help streamline the participation process and ensure high-quality installations:

- The program should continue to look for ways to minimize program-required paperwork and provide clear and easy documentation to help participants that may end up moving and transferring the account to a new owner or occupant.
- The program should consider changing the type of showerheads since these were frequently replaced by single-family participants. The program should also develop good QA/QC practices for landscaping measures to ensure that there are no issues.

To understand the potential for the program and whether the offer should be expanded:

- The program should evaluate the potential for participation among water districts (based on screening factors such as AMI billing, etc.) and among customers. As might be expected, not all customers will be interested or choose to participate. If there is a need to expand the target base, the program could look for opportunities to expand the offering to better meet DIYers and those who are skeptical of the “high interest rates” and/or may already have the ability to fund projects on their own. This may mean coupling the current offering with other available programs or the guidance already offered by BayREN’s Energy Advisors.

Recommendations for Future Research

Based on the findings above, we also recommend conducting additional research with non-participating water districts and non-participating contractors. This research should be conducted after determining final design so that the research can be used to test the proposed design.

Appendix A: Bibliography

1. Cadmus and Research into Action. 2013. *Process Evaluation Report. On Water Bill Pilot*. Regional Climate Protection Authority.
2. GDS Associates. 2003. *Process Evaluation of the Pilot "Pay As You Save" (PAYS) Energy Efficiency Program*.
3. MACED. 2017. *Energy Efficiency for Everyone*.
4. Ouachita Electric. 2017. *Opening Opportunities with Inclusive Financing for Energy Efficiency. Report on the first year of the HELP PAYS® Program at Ouachita Electric*.
5. Wynn, Curtis. 2016. *Upgrade to Save*. Roanoke Electric Cooperative
6. Johnson Consulting Group. 2009. *Year 2 Process Evaluation Report for SolarSaver Pilot Program*. Hawaiian Electric Company, Maui Electric Company, and Hawaii Electric Light Company
7. Cillo, Paul. 2008. *Pay As You Save*. Policy Leadership Institute
8. State and Local Energy Efficiency Action Network. 2014. *Financing Energy Improvements on Utility Bills: Market Updates and Key Program Design Considerations for Policymakers and Administrators*. Prepared by: Mark Zimring, Greg Leventis, Merrian Borgeson, Peter Thompson, Ian Hoffman and Charles Goldman of Lawrence Berkeley National Laboratory.
9. Walton, Robert at Utility Dive. 2016. *Pay As You Save: Co-ops are reaching new customers with a novel way to pay for efficiency*. <https://www.utilitydive.com/news/pay-as-you-save-co-ops-are-reaching-new-customers-with-a-novel-way-to-pay/424234/>
10. ACEEE. No Date. *On-Bill Energy Efficiency*. <https://aceee.org/sector/state-policy/toolkit/on-bill-financing>

Appendix B: Additional Details on Relevant Policies

SBX7-7 requires all urban water suppliers to reach a 20% per capita reduction in water use by December 31, 2020. The Department of Water (DWR) collects this information and makes it available through a public portal: <https://wuedata.water.ca.gov/>. According to the DWR site, as of 2017, there are 394 urban water suppliers per California Water Code definition. Twelve of these suppliers are under the reporting threshold per California Water Code definition. As of 2016, all 394 of these water suppliers had met their progress water savings of 10% per capita reduction. Part of their ability to meet those goals may have been with the help of the DWR program on water/energy savings (a program that is now closed). In 2017, the legislature put a structure in place to allow for a PAYS® type program on a regional basis (but just for the nine bay area counties and Los Angeles county), which has the possibility of helping the water agencies in these counties to meet their 2020 targets.

Greenhouse Gas Policies

- **Assembly Bill 32** (2006) requires the state to cut GHG emissions to 1990 levels by 2020. http://www.leginfo.ca.gov/pub/05-06/bill/asm/ab_0001-0050/ab_32_bill_20060927_chaptered.pdf
- **Senate Bill 32** (2016) requires the state to cut GHG emissions to 40% below 1990 levels by 2030, a more ambitious target than the previous goal of hitting 1990 levels by 2020 (set by AB32). https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201520160SB32
- **Senate Bill 350** (2015), the Clean Energy and Pollution Reduction Act legislatively mandates that by 2030, 50% of energy sold to customers come from renewable sources and puts forward a goal of doubling energy efficiency savings in electricity and natural gas end uses. The target of the doubling of energy efficiency are based on “the mid case estimate of additional achievable energy efficiency savings, as contained in the California Energy Demand Updated Forecast, 2015-2025, adopted by the commission”. Legislation: http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201520160SB350. Forecast: <https://www.energy.ca.gov/2014publications/CEC-200-2014-009/CEC-200-2014-009-SD.pdf>

Water Conservation Policies

- **The Water Conservation Act of 2009 (Senate Bill X7-7)** was enacted in November 2009 and requires that all water suppliers increase their urban water use efficiency and achieve a 20% reduction in urban per capita water use by December 31, 2020. (Baseline is daily urban per capita use with variation for indoor and irrigated use that account for variation in climate and population and sums to 20% reduction across the state.) Additionally, the law required an incremental 10% reduction by 2016, which all water agencies met. The bill includes information on agricultural water use that we do not include here as it isn't relevant for our current research.
http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=200920107SB7
- **SB 407, Padilla. Property transfers: plumbing fixtures replacement.** (2009)
https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=200920100SB407
 - Placed into law in 2009, this legislative action mandates that any residential or commercial property built before 1994 must replace plumbing fixtures that are not water conserving according to a set timeline. Specifically, on or after January 1, 2014, all alterations or improvements in single-family residential, multi-family, or commercial buildings must include water conserving plumbing fixtures before obtaining a final permit. On or after January 1, 2017, sale of a single-family, multi-family or commercial building must include disclosure of noncompliant plumbing and all noncompliant fixtures in any single-family residential buildings must be replaced. On or after January 1, 2019, this mandate expands to multi-family and commercial buildings - the water-conserving plumbing fixtures prescribed by the bill must operate at the manufacturer's rated water consumption or be replaced with water-conserving plumbing fixtures. The bill would permit an owner or the owner's agent to enter rental property for the purpose of installing, repairing, testing, and maintaining water-conserving plumbing fixtures, as specified, and would require, on and after January 1, 2019, that the water-conserving plumbing fixtures prescribed by the bill operate at the manufacturer's rated water consumption at the time that a tenant takes possession, as specified.
 - Plumbing fixtures that must comply are toilets, urinals, showerheads, and faucets.
 - The bill would permit a city or county or retail water supplier to enact a local ordinance or policy that promotes compliance with the bill's provisions or that will result in greater water savings than otherwise provided by the bill. The bill would provide that any city, county, or city and county that has adopted an ordinance requiring retrofit of noncompliant plumbing fixtures prior to July 1, 2009, is exempt from its requirements so long as the ordinance remains in effect.
- **Department of Water Resources** – required by SBX7-7 to provided information to support water efficiency. Through partnerships, grant and loan programs, and research and data analysis, the Water Use and Efficiency Branch of DWR works with agencies and individuals to provide assistance for improving water use efficiency and developing and meeting efficient water use requirements. <https://water.ca.gov/Programs/Water-Use-And-Efficiency> There are four relevant grant/loan programs – two of which are still open:
 - *OPEN -- Calconserve Water Use Efficiency Loan Program:* This program offers \$10 million in loans to local agencies for specific types of water conservation and water use efficiency projects and programs that seek to achieve urban water use targets. Loans are available on a first-come, first-served basis until funds are exhausted. According to the website, there is currently \$6.75 million left for loans (\$1.75M for water use efficiency upgrades and \$5M for fixing expensive and difficult to repair customer leaks).
 - *OPEN -- Save our Water Rebates:* This is a \$24M program that provides rebates for removing turf and replacing it with landscapes that require little water at California single-family residences. It continues to take applications for rebates of up to \$2/square foot.
 - *CLOSED -- Institutional Turf Replacement Programs:* The Institutional Turf Replacement Program, which ended on June 30, 2018, provides assistance with the removal and replacement of turf with water-efficient California native plants to conserve water and restore California's natural heritage. The program is open to local governments.
 - *CLOSED -- Water-Energy Grant Program:* This program, which has no open solicitations at this time, provided funds to implement water efficiency programs or projects that reduce greenhouse gas emissions, and reduce water and energy use. The program funded projects in 2014 and 2016 that installed over 28,000 water savings devices and removed over 170,000 acres of grass.

- **Executive Order B-29-15** (4/1/2015) Calls for actions to save water, increase enforcement to prevent wasteful water use, streamline the state's drought response, and invest in technologies that will make California more drought resilient. For the first time in state history, the Governor directs the State Water Resources Control Board to implement mandatory water reductions in cities and towns across California to reduce water usage by 25 percent through February 2016, as compared to the amount used in 2013.
<https://www.gov.ca.gov/2014/12/22/news18815/>
- **Senate Bill 564 Water Bill Savings Act.** (2017) authorizes a joint powers authority to provide funding for a customer of a local agency in the Counties of Alameda, Contra Costa, Los Angeles, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma or its publicly owned utility to acquire, install, or repair a water efficiency improvement on the customer's property served by the local agency or its publicly owned utility. The bill would require the customer to repay the authority through an efficiency charge on the customer's water bill to be established and collected by the local agency or its publicly owned utility on behalf of the authority pursuant to a servicing agreement. The bill would authorize the authority to issue bonds to fund the program. The bill would require an efficiency improvement to comply with certain provisions of the CalConserve Water Use Efficiency Revolving Loan Program guidelines to be eligible for financing under the bill.
 - This legislation is restricted to water-only measures, although there will be embedded energy savings (pumping, water supply, water treatment, and savings from water heating).
https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201720180SB564

Appendix C: Details of Sample Past PAYS® Programs

As of March 2018, The Energy Efficiency Institute shows multiple PAYS® programs in seven states across the US (this includes those in BayREN's territory).³⁷ The earliest of these programs began in 2002 with the others starting up between 2008 and 2016.

Main Takeaways from PAYS® literature review

- **Types of organizations offering PAYS®:** Among the seventeen PAYS® programs, fourteen are programs run by electric and gas utilities and the other three are the BayREN PAYS® programs implemented by water districts. Of the seventeen programs, five are no longer active. Of the seventeen programs, California's three water programs are run by water districts, ten programs are or were operated by cooperative utilities (one program appears to no longer be operating), and four are or were operated by investor-owned utilities (the three Hawaiian Electric Company, HECO subsidiaries, did not continue their three-year pilot program).
 - Most of the programs have been implemented at smaller utilities. While Eversource has over 500,000 targeted municipal customers and the three HECO utilities serve most of Hawaii's customers, the next largest program is in Kentucky where a single organization operates PAYS® for six different utilities covering ~135,000 customers. New Hampshire Electric Cooperative has 84,000 customers. Midwest Gas and Electrical has a population of approximately 50,000 customers and the other two electric cooperatives have a customer population of under 15,000 each in their target population.
- **Number of participants/likelihood to scale:** Based on raw numbers, utilities implementing PAYS® program have implemented a small number of projects—only one has close to 2,000 projects across ten years. However, a per capita analysis indicates that comprehensive services have been provided to approximately four percent of a utility's customers at 4 utilities, a very high percentage relative to participation at utilities throughout the country, indicating that the potential to scale exists.
- **Default rates:** Of the seventeen PAYS® programs, only 2 do not report the amount of uncollectables relating to their PAYS® programs, not including collectables waived by the utilities for customer service reasons. All other utilities report uncollectables (i.e., bad debt) of less than 0.1%, except for the six Kentucky utilities. After one year, they made improvements to their program and uncollectables dropped from 2% to 0.4.

Sample programs currently running

OUACHITA ELECTRIC COOPERATIVE

- **Organizational description:** Arkansas-based cooperative (co-op) with about 6,920 customers, 91% are residential
- **Years active:** 2 years - began HELP PAYS® in 2016
- **Target of the program:** Single family, multi-family, commercial
- **Offering:** Replaced a bill neutral on-bill loan program (called HELP) with an opt-in tariff (called HELP PAYS®). The HELP PAYS® program expanded the HELP weatherization program to include heat pumps, and to serve rental customers and commercial customers. All residential customers living in multi-family buildings who pay for their own energy costs have participated.
- **Projects:** 283
- **Other findings:** Arkansas Public Service Commission voted to approve the co-op's opt-in tariff in approximately 3 months. Comparing their previous HELP program (in 2016) to HELP PAYS® (in 2017)
 - Participation increased 3X. From 70 SFD HELP in one year to HELP PAYS® including 113 SFD (all but 2 were owners), 82 multi-family units in three properties (all rentals), and 2 commercial customers in the next year.

³⁷ The information in this section was provided and/or reviewed by Harlan Lachman.

- EE cost of capital investments increased from HELP (\$500,000) to HELP PAYS® (\$1.45 million)—also approximately 3X.

ROANOKE ELECTRIC COOPERATIVE

- **Organizational description:** North Carolina Electric Co-op with 1,400 meters, 95% residential and with high customer bills
- **Years active:** 3 years - began PAYS® in 2015
- **Target of the program:** All customers
- **Offering:** Weatherization including insulation, duct sealing, air sealing, HP upgrades, water heater wraps, LED. Customers may have a co-pay to make the investment pass.
- **Projects:** 290
- **Other findings:** None

HOW\$MART KY

- **Organizational description:** A PAYS® program run across six co-ops in Kentucky with ~135,000 customers in total
- **Years active:** 7 years - began PAYS® in 2011
- **Target of the program:** Single family, renters, commercial
- **Offering:** Various weatherization measures such as insulation, duct sealing, air sealing, programmable thermostats, and HVAC systems
- **Projects:** 312
- **Other findings:** Investments total ~\$3.8 million and have seen 0.4% of uncollectible costs.

HOW\$MART

- **Organizational description:** A PAYS® program run in Kansas by a co-op with ~93,000 customers in total
- **Years active:** 10 years - began PAYS® in 2008
- **Target of the program:** Residential
- **Offering:** Weatherization, Ground Water Source Heat Pumps, Commercial Heat Pump
- **Projects:** 1,915
- **Other findings:** Investments total ~\$14 million and have seen <0.1% of uncollectible costs.

SMART START

- **Organizational description:** A New Hampshire PAYS® program run by Public Service of New Hampshire (now Eversource) utility for municipal customers
- **Years active:** 16 years - began PAYS® in 2002
- **Target of the program:** Municipal customers
- **Offering:** Offers rebates and then PAYS® to pick up the remaining cost of the measures. Stated to be for all eligible measures, almost all projects were lighting projects.
- **Projects:** 269
- **Other findings:** Investments total ~\$10 million and have seen <0.0% of uncollectible costs.

Closed Programs

HAWAII ELECTRIC

- **Organizational description:** Based in three counties in Hawaii
- **Years active:** Closed now. Began PAYS®-type pilot in 2007 planned for three years and exhausted the budget for the pilot in two years due to increased customer demand. They terminated their pilot when funds were exhausted.
- **Target of the program:** Customers in the market for a solar water heater. Required by the legislature to provide a PAYS®-type program for solar water heaters.
- **Offering:** Solar water heaters

- **Projects:** 484
- **Other findings:**
 - Billing was described as labor intensive. Customers sometimes forgot to pay the separate bill, but the amounts were small (less than \$100) and not a priority for collection

NEW HAMPSHIRE ELECTRIC COOP

- **Organizational description:** New Hampshire Electric Cooperative (NHEC) with over 84,000 members throughout the state
- **Years active:** Closed now but ran for only three years. NHEC began its PAYS® pilot in 2002 with the plan to run through the end of 2004. Although ordered to continue its program in 2004 by the NH Public Utilities Commission, there is no evidence of whether they continued their program. NHEC does not have a PAYS®-type financing program on their website (just a typical loan program and an on-bill loan program).
- **Target of the program:** NHEC targeted residential and commercial members.
- **Offering:** Residential weatherization, lighting at retail outlets, commercial HVAC projects.
- **Projects:** At the time of the study, 12 residential weatherization or commercial HVAC and lighting projects and 151 portable lighting measures (which were CFL bulbs).
- **Other findings:** Third party study concluded after 18 months of the program found that PAYS® appeared to increase participation and helped overcome high first costs in municipalities but did not affect split incentives. Customers liked the program.

Appendix D: Survey Instruments and Guides

Appendix D.1 – Water Utility District Interviews – Participants

Overall Satisfaction

1. How satisfied are you with your experience in the pay-as-you-save (PAYS®) on-bill program [or your version of this program]?

Program Value

2. What do you see as the benefits of offering a pay-as-you-save on-bill program to your customers?
3. What other conservation programs have you implemented? Were they successful and why?
4. What are your conservation goals and how close are you to achieving them? Are these goals sufficient for you to meet new/pending water conservation targets set by the Department of Water Resources?
5. Have you been able to obtain more customer conservation through the pay-as-you-save model than you would have absent the program? [If so] How much more?

Decision making

6. Who was involved in making the decision to offer the pay-as-you-save on-bill program to your water customers, and how long did it take?
7. Was providing the funding for the projects upfront a big barrier to deciding to offer this program?

Barriers and Challenges

8. Aside from any financial barriers, what other barriers or hurdles did your organization have to navigate in order to offer the program?
9. What challenges have you encountered during the implementation of the program? What would you do differently (if anything) based on what you've learned from this process?
10. Did you experience any specific challenges when adjusting your billing system so that you could add a line item charge and track payments to participating customer accounts?
11. Are you experiencing any issues with receiving or processing customer payments?
12. What percent of participants that have moved since they participated? That is, how many, or what percentage of participants have closed their account prior to fully paying off their program charge? Have you encountered any challenges or problems with repayment from these accounts?
13. What problems do you see for other water utilities that are interested in offering this program to their customers?
14. Has your water district/utility ever joined or used existing membership to a Joint Powers Authority (such as the Association of Bay Area Governments) to offer additional Program services to customers? [Would your utility be willing to join or use existing membership to a Joint Powers Authority (such as the Association of Bay Area Governments) to expand your Program services to customers?

Customer Feedback

15. How does your water utility, and its staff, interact with customers under this program? What feedback have you heard from customers?

Contractor Feedback

16. How does your water utility, and its staff, interact with program contractors? What feedback have you heard from the contractors?

Support from BayREN

17. Do you feel like you have received the support you need from BayREN? What additional support would you need?

Recommendations for the Future

18. Are you planning to continue to offer this program in 2018 and into 2019?

19. What changes would you like to see in the program?

20. Any other recommendations for program improvements? Are there any other issues or comments that you would like to share?

Thank you for your time and insights.

Appendix D.2 – Contractor Interviews -- Participant

Introduction

1. [Explore the type of contractor, typical clients and services, and role in the program as part of the intro]

Satisfaction and Value

2. How satisfied are you with your experience in the program? [Probe for why]
3. Why did you choose to participate?
4. What do you see as the benefits of participating in the program? [Probe for the value of program]
5. Have you seen your participation in the program increase your business or give you a competitive edge?

Barriers and Challenge

6. What barriers or hurdles did your organization have to navigate to participate?
7. What challenges have you encountered during the implementation of the program?
8. Is it difficult for you to participate in this program? Do you think other contractors will see it as burdensome? [Probe: In what ways is participation difficult?]
9. How do the prevailing wage requirements influence your thoughts about the program?

Measure Installations

10. Are certain measure improvements more difficult to install than others? [Probe for details]
11. Would you install these improvements at customer sites without the program? Why or why not?

Customer Marketing and Feedback

12. How do you market the program to customers? What types of customers are interested? [Probe for whether they are customers that the contractor had prior relationships with]
13. How do you interact with customers around this program? What feedback have you heard from customers?
14. Is it difficult for customers to participate in this program? Do they see it as burdensome?

Support from BayREN

15. Do you feel like you have received the support you need from BayREN? From Frontier?
16. What kind of training did you receive? Do you think you received enough training or would you suggest some other training for new contractors?
17. What additional support do you think other contractors will need?

Recommendations for the Future

18. Are you planning to continue to participate in 2018 and into 2019 or a BayREN Regional Water Bill Savings Program? At the same level, decreased level, or increased participation? What would it take to increase the number of participants?

19. What changes would you like to see in the program?

20. Any other recommendations for program improvements? Any other issues or comments that you would like to share?

Thank you for your time and insights.

Appendix D.3 – MF Participant In-Depth Guide

Introduction

We would like to ask you about your participation in the [program name] to help us improve the program.

Participant Description

[CONFIRM ADDRESS, UNITS AND \$ FROM DATABASE WHILE ESTABLISHING CONNECTION WITH RESPONDENT WHERE WE HAVE THIS INFORMATION]

1. Is the building (or the buildings) that participated in the PAYS® program considered to be affordable housing or market rate housing?
2. Did all of the buildings and units that you own or operate participate in the PAYS® program? If no, why not? (Probe for percent of buildings, of units that participated, if not all)

Marketing, Outreach and Pre-Program Communications

3. How did you initially hear about the program?
4. When you first heard about it, who did you think was offering the program?
5. Overall, was it easy or difficult for you to understand the program?
6. What information and supporting materials did you receive as an introduction to the program? (Probe to see if it came from the contractor, town, other)
7. Was this information easy to understand? Did it provide you with the information that you needed to understand the program?

Customer Understanding of Program Benefits and Terms

I would like to ask you about your understanding about eight specific benefits and program terms.

8. Did you feel like you fully understood...?
 1. The potential water bill savings that you would see on your bill
 2. The potential energy (electric and natural gas) bill savings that you would see on your bill
 3. That your savings would immediately exceed your charges
 4. How program costs would show up on your water utility bill
 5. That your charges would stop if the upgrades failed and were not repaired (i.e., the extended warranty)
 6. That your charges would stop if you sell the building and disclose participation in the program
 7. That you would be responsible for general maintenance and care of the installed improvements
 8. Program fees
9. Was there anything that surprised you during the sign up, installation or participation process?
10. What additional information do you wish you had received? (Probe for whether this would have been useful before they signed up, before they installed, or once they were paying back)

Motivation for Participating and Decision Making

11. Who made the decision to participate?

12. Why did you (or your building) choose to participate? What convinced you?
13. Is your building required to upgrade the efficiency of water-using measures (such as toilets) when you get new tenants? (Probe for if it's "required" or just common practice. Probe for why/why not and if they are aware of state requirements starting January 2019.)
14. Did the folks making the decision to participate have any concerns before deciding to participate in the program? If yes, what were they?
15. Do you think that other multi-family building owners would participate in this program? Why or why not?

Program Influence

16. How difficult is it to get capital for upgrades (generally) at your facility? How about for interior water saving devices such as toilets, showerheads, or faucet aerators? And for outdoor water savings options such as irrigation measures?
17. When you signed up for the program, were you considering other water or energy efficiency programs that offer the same measures? If yes, which ones? Did you participate in those programs too? (Probe to see if they received other financial incentives or rebates, and what they received)
18. Would you have installed the same measures without the program? (If yes, probe for **when** they would have installed the measures, and if they would have installed the **same number** of measures)

Participant Perspectives and Satisfaction

19. Who pays the water bill in your building(s)? How about the energy bill?
20. Have you seen water and/or energy savings? How much? Were the savings what you expected?
21. Overall, how satisfied are you with your program experience? Please describe any issues that you have encountered with the program (agreements, installation, contractor, payments, measures, communications)?
22. Have you received any feedback from your tenants about the measures?

Indications of Additional Program Effects

23. Have you made any other water or energy saving changes to your facility since participating in the program? What did you do?
24. Were these at all related to your participation in the PAYS® program?

Missed Opportunities

25. Are there additional plumbing, irrigation, or energy savings measures you'd liked to see offered by the program? If so, what measures?
26. Do you have any other suggestions to improve the program?

Thank you for your time.

Appendix D.4 – MF Near-Participant Interviews

Introduction

I am contacting you on behalf of the City of Hayward and the Bay Area Regional Energy Network regarding the Green Hayward PAYS® program. I work for a third-party research organization conducting research to help improve the program.

We have been asked to speak with multi-family owners/contacts and their representatives who considered the Green Hayward PAYS® program but chose not to participate. Our records indicate that your company received a program proposal to install water savings measures for your building located at [interviewer will read in address to confirm/update/terminate as needed]. Is that correct? [IF 'DOES NOT RECALL' WE WILL AID RECALL –SEE APPENDIX]

The interview will take about 15-20 minutes, and you will receive a \$100 Amazon Gift Card by email (or mail if that is your preference) after you complete the interview. Would you be willing to answer some questions now, or schedule a time to answer some questions to help us improve this water conservation program?

[CONTINUE OR SCHEDULE FUTURE INTERVIEW TIME]

Site visit and proposal feedback

1. Do you recall receiving a proposal for how to save water and energy at your property [in MONTH YEAR from database]? [IF 'DOES NOT RECALL' WE WILL AID RECALL –SEE APPENDIX]
[IF RECALLED PROPOSA, continue]
 - a. Did you review the proposal?
 - b. Did you find it easy to understand? Was anything confusing?
 - c. Do you remember what you thought was confusing? [Probe for feedback on proposal]
 - d. How could the proposal have been improved?
2. Did someone visit this property to conduct an on-site assessment?
 - a. [IF YES] Did you experience any problems with the on-site visit? [Probe to see if they what they found to be valuable from the on-site assessment.]

Installation of measures

Based on the information provided to us, the proposal you received recommended installing [interviewer will read in measures].

3. Did you install any of these improvements on your own using the program contractor or your own contractors or maintenance staff? (If they claim they installed improvements, clarify and record whether they use the program contractor Bottom Line Utility Solutions.)
 - a. IF INSTALLED, Which of the recommended improvements did you install?
[Probe for details on who installed, whether they used rebates, if they know the specs of the toilets and showerheads, and whether they would have done it absent the proposal -- what role did the proposal and visit play]
 - b. IF INSTALLED, Did you use a different program? (elicit information about the other program)
 - c. IF INSTALLED, why did you choose to install these improvements without the Green Hayward PAYS® program? (Be careful not to prompt or suggest reasons. Rephrase the question: e.g., What reasons justified making these improvements on your own?)
 - d. IF INSTALLED, have you received any feedback from your tenants about the improvements? (Probe to identify complaints with contractor(s), quality/use of the improvements, problems with the installations, especially call backs, etc.)
 - e. ASK ALL. Did you consider using the PAYS® program to pay for and install the measures?

Benefits and Barriers to participation and recommendations for the future

4. In your own words, what did you see as the benefits of participating in the Green Hayward PAYS® program?
5. Why didn't you participate in the Green Haywards PAYS® program (that is, why didn't you go through the program)? What were the barriers that kept you from participating in the program?
[LISTEN FOR ISSUES AROUND INTEREST RATE FOR THOSE WHO DECLINED PROPOSAL]
6. I want to ask you about seven program features that the program designers thought would justify participation in the program. As I read through the seven, let me know if you were aware of these benefits.
 - a. The potential water bill savings that you would see on your water bill
 - b. The potential electric bill savings that you would see on your PG&E bill
 - c. That your savings would immediately exceed your charges
 - d. That these project costs would not appear on your books as a debt obligation or a loan
 - e. That your charges would stop if the upgrades failed and were not repaired (i.e., the extended warranty)
 - f. That your charges would stop if you sell the building and disclose participation in the program
 - g. And finally, that most multifamily building owners had to install these improvements anyway because of updated building code requirements
7. Are any of these benefits particularly attractive to you? Which ones are not attractive or don't seem to matter? (Interviewer will re-read as needed.)
8. What changes to the program offer might have led to a decision to participate in the Green Hayward PAYS® program? Is there anything that the program could have changed that would have convinced you to participate?
9. Has your building participated in other water saving, energy saving, or rebate programs since the PAYS onsite assessment? If yes, which programs?

Decision making

10. Are you the person who makes the decision to upgrade fixtures and building systems and participate in programs such as these? If not, how is the decision made?
11. How many people are involved in this type of decision (if more than one, elicit the titles/roles)

Feedback on marketing and presentation of the program

12. How did you initially hear about the program? Can you describe the information that you heard and how it was communicated to you to the extent that you remember?
13. At the time that you heard about it, who did you think was offering the program?
14. Do you feel like you understood the program terms and conditions when the program explained them to you during your prior interactions? [Interviewers are knowledgeable about the program and can help remind the respondent, if needed, but they are also covered in earlier question.]
15. Is there any other information that you wish you had received?

Demographics/Firmographics

16. Who pays the water bills in your building(s)? How about the electric and/or gas bills?
17. Is the building (or the buildings) classified as affordable housing?

18. Do you own or manage other multi-family buildings in the Bay Area? How many buildings/units? Market rate or affordable housing?
19. How difficult is it to get capital for upgrades (generally) for your property (or properties)? How about for interior water saving devices such as toilets, showerheads, or faucet aerators? And for outdoor water savings options such as irrigation measures?

Other

20. Is there anything else that you would recommend to help BayREN improve this or future programs?

[CONFIRM EMAIL OR MAIL ADDRESS FOR GIFT CARD]

Thank you for your time.

Appendix D.5 – SF Participant Survey (Windsor Efficiency PAYS®)

Introduction

We would like to ask you about your participation in the Windsor Efficiency Pay as You Save (PAYS®) program to help us improve the program. Thank you for taking the time to complete this survey.

Marketing, Outreach and Pre-Program Communications

We understand that you signed up for the program several years ago (in 2013 or 2014). Do you recall how you heard about the program?

1. How did you hear about the program? (multiple response, rotate all but other and ‘I don’t recall’)
 1. Saw something online
 2. Received a mailing or insert in water bill
 3. Received an email from the town of Windsor
 4. Talked to a contractor
 5. Community meeting
 6. Newspaper
 7. Word of mouth (friends, family, neighbors)
 8. Other, specify
 9. I don’t recall

2. At the time that you heard about it, who did you think was offering the program? (rotate all but ‘other’) (allow multiple response)
 1. My water utility
 2. The town of Windsor
 3. PG&E
 4. The Contractor (Bottomline Utility Solutions or Water Management, Inc.)
 5. Other, specify

3. On a scale of 1-5 (where 1 is very difficult and 5 is very easy), how easy was it to understand the program?
 1. 1 Very difficult
 2. 2
 3. 3
 4. 4
 5. 5 Very easy
 6. Don’t recall

Customer Understanding of Program Benefits and Terms

4. Prior to participating, do you feel like you understood...? (*I did not understand at all; I understood a little; I understood quite a bit; I understood completely, I don’t recall*)
 1. The potential water bill savings
 2. The potential energy (electric/natural gas) bill savings
 3. That savings would immediately exceed charges
 4. How program costs would show up on your bill
 5. That charges would stop if the upgrades failed and were not repaired
 6. That charges would stop if you sell your home and disclose participation to the buyer
 7. That you would be responsible for general maintenance of the improvements
 8. Program fees

5. Was there anything that surprised you during the sign up, installation or participation process?

1. Yes, specify
 2. No
6. What additional information do you wish you had received?
1. None
 2. Please specify additional information that would have been useful and when you would have liked to receive it

Motivation for Participating/Barriers to Participating

7. Do you think that other households should participate in this program?
1. Yes
 2. No
8. What do you think might prevent other households from participating?

Customer Perspectives and Customer Satisfaction

9. Have you seen water and/or electricity savings? My household has seen...
1. Water and energy savings
 2. Water savings only
 3. Energy savings only
 4. No savings
 5. I don't know
10. How satisfied are you with ... (5-pt scale from 1 extremely dissatisfied to 5 extremely satisfied)
1. Your overall program experience?
 2. The proposal that you received?
 3. The agreement that you had to sign (i.e., paperwork)?
 4. The contractor(s) that installed your measures?
 5. The measures that were installed?
 6. The frequency and method of follow up communications?
 7. The timeliness of follow-up communications?
 8. The process of paying program costs over time on your water bill?
 9. The savings from the measures?
11. Please describe any issues that you encountered with the program (agreements, installation, contractor, payments, measures, communications)? *Please describe any issues where you provided a low ranking above or any other issues that come to mind.* (open end)

Program Influence

12. Would you have paid for or installed the same measures without Windsor Efficiency PAYS®?
1. Yes
 2. No

[If yes to question about installing the same measures]

13. Absent the PAYS® program, when do you think you would you have installed the measures?
- a. Same time
 - b. 0-6 months later
 - c. 6 months to a year later
 - d. More than a year later
 - e. I don't know

[If yes to question about installing same measures]

14. Absent the PAYS® program, how many measures would you have installed?
- Same number
 - Fewer
 - More
 - I don't know

Measures

15. What measures were installed in your home through the PAYS® program? *(see responses under Q17 below)*
16. Are they still installed? *(Online survey will have grid with responses for Q16/17: Not installed, Installed and removed, Still installed, I don't recall)*
- Low-flow toilet(s)
 - Low-flow bathroom faucet aerators
 - Low-flow kitchen sink aerator
 - Low-flow showerhead(s)
 - Chilipepper/Hot water recirculation pump
 - Refrigerator
 - Clothes washer
 - Lawn conversion to drought tolerant landscaping
 - CFLs or energy efficient lighting

[If they indicate that they removed to any of the measures above]

17. You indicated that you removed [some measures/INSERT MEASURES REMOVED]. Why did you remove these measures? *(For aerators, please indicate if you removed all of the measures or just some?)*

Indications of Additional Program Effects and Missed Opportunities

18. Have you made any other water or energy saving changes to your home since participating in the program?
- Yes
 - No

[If yes "made other changes"]

19. What additional changes did you make? *(open end)*
20. Was it at all related to your participation in the Windsor Efficiency PAYS® program?
- Yes *(Please specify how?)*
 - No
21. Are there additional plumbing, irrigation or energy saving measures that you would like to install in your home? Please select those that apply *(None or Multiple Response)* *[Note to BayREN: this is to explore additional opportunities]*
- None
 - Replace additional toilets
 - Replace additional bathroom faucet aerators
 - Replace kitchen sink aerators
 - Replace additional showerheads
 - Lawn conversion to drought tolerant landscaping
 - Lawn irrigation system
 - LED or energy efficient lighting
 - Other, specify *(even if not supported by the current program)*

Additional Program Recommendations

22. Windsor is considering simplifying the program by not offering drought tolerant landscaping. In your opinion, do you think this change would lead to...
1. More people participating
 2. Fewer people participating
 3. No difference in participation
 4. Don't know
23. Do you have any other suggestions for improving the program?
1. No
 2. (open end)

Demographics

Lastly, we have a few questions about your household.

24. Which of the following describes your home?
1. One family detached home
 2. One family attached home (we share a wall with another family)
 3. A home with 2-4 units
 4. A home with over 5 units
25. Do you own or rent your home?
- a. Own
 - b. Rent
 - c. Other, specify
26. Which income bracket best describes your household income last year (2017)?
- a. Less than \$48,000
 - b. \$48,000 to < \$75,000
 - c. \$75,000 to <\$100,000
 - d. \$100,000 to <\$125,000
 - e. \$125,000 or over
27. What is your zip code?

Thank you for your time.