

BayREN Residential Contractor Research



Pictures from BayREN's website

Prepared for:
BayREN Single Family Team

Prepared by:
GROUND**UNDED**
— RESEARCH AND CONSULTING —

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Overview of Document

BayREN's Single Family team contracted with Grounded Research and Consulting, LLC to perform several quick-turn around research efforts focused on helping their team understand the market of available contractors for their residential program as well as gaining insights from their current contractors. The research took place over several months (between July 2018 and February 2019) with the output of three memos and one annotated bibliography. The total of all research efforts was slightly less than \$35,000.

This document is a concatenation of previous memos to bring all information into one location and enable easier sharing of the research.

Memo #1 – Description of BayREN's active contractors (8/3/18)

This memo provides information on the current active contractors working with BayREN as part of the Home Upgrade program (as of mid-June 2018). Specifically, the memo covers contractor characteristics of:

- **Numbers:** Number of projects by size of company and length of time as an active contractor within the program.
- **Contractor Location, Licenses, and BPI Certified employees**
- **Projects:** How active contractors have been over time, types of measures installed

All contractor and project data were from the BayREN Energy Orbit database, provided to Grounded Research by CLEAResult.

Memo #2 – Population level statistics on contractors within BayREN and summarized information from a literature review (9/11/18)

This memo provides information on contractors gleaned from an analysis of Bay Area population level data on contractor licenses, and a literature review of whole house and contractor-based studies.

The memo covers:

- **Number and Type of Contractors** – Specifics on numbers and types of contractors in the Bay Area who work with residential customers
- **Contractor Challenges** – Findings from our literature review on contractor barriers and challenges related to programs like Home Upgrade, and suggested solutions for overcoming those challenges
- **Long-term Engagement with Customers** – Considerations for moving to a program that engages with a customer over a longer period
- **Potential Future Research with Contractors**

The memo also includes an annotated bibliography as a companion piece.

Annotated Bibliography – Detailed information from a literature review (8/22/18)

This annotated bibliography provides the results of Grounded Research's literature review, which focused on exploring the type of contractors and barriers experienced by contractors in the California Home Upgrade program and similar programs outside of California. BayREN is specifically interested in learning how other programs handle paperwork and any good approaches to streamlining the needed contractor paperwork. We also included general program implementation information and resources as seemed relevant.

Memo #3 – Contractor Feedback (2/18/19)

This memo covers information from a survey of 25 of 95 participating contractors (26% response rate) and in-depth interviews from nine contractors who either dropped out of participating (four prior participants) or attended an introductory training but chose to go no further (five near participants). Specifically, the memo describes four areas:

- **Program Value to Contractors**
- **Contractor Challenges**
- **Contractor Interest in New Program Components**
- **Contractor Thoughts on Training Content and Logistics**

MEMORANDUM

To: Kellen Dammann, Dana Armanino Marin County, Shraddha Mutyal, MTC

From: Mary Sutter and Jenn Mitchell-Jackson

Date: 8/3/18

Re: BayREN Current Contractor Information, Updated



This memo provides information on the current active contractors working with BayREN as part of the Home Upgrade program. Additionally, we analyzed Home Upgrade project level data, which includes information from 2013 to June 2018 and we provide a few statistics relevant to contractors. All contractor and project data are from the BayREN Energy Orbit database, provided to Grounded Research by CLEAResult on 7/19/18.

This document is an updated version of the memo delivered on 7/27/18. We incorporated feedback from Marin County and CLEAResult as well as adding new information on the date the contractor joined the program and windows as a measure (provided by CLEAResult on 8/1/18 and 8/3/18).

Active Contractor Characteristics

BayREN currently has 111 active contractors.¹ These 111 active contractors included 2,076 employees at the time the company completed the registration.² Of these, 95 have a paid project sometime between 2013 and 2018 and 88 have paid or reserved projects in 2017 or 2018.

The active contractors with paid projects in 2017 or 2018 are relatively small companies with over half (52%) having 10 or less employees. However, most projects are from companies with 11-25 employees (see Table 1).

Table 1. Number of Employees in Active Contractor Companies with Paid or Reserved Projects

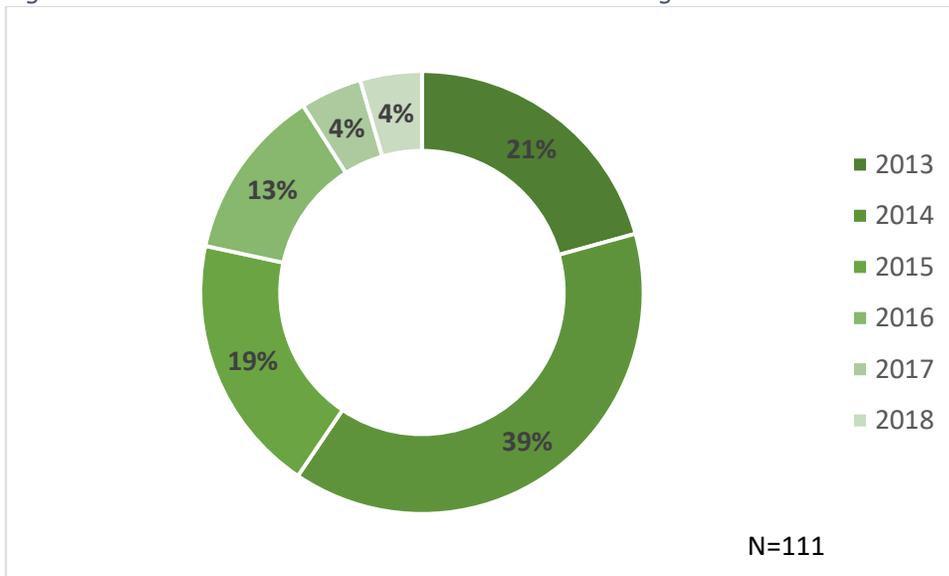
Number of Employees	Projects Paid or Reserved in 2017-2018	
	Percent of Companies (N=88)	Percent of Projects (N=2,270)
1-4	26%	15%
5-10	26%	17%
11-25	26%	44%
25-50	14%	23%
Over 50	8%	1%

As shown in Figure 1, most active contractors joined the program in 2013 or 2014 (66 of the 111, or ~60%). Ten new contractors have joined the program in the past 1.5 years (i.e., five each in 2017 and 2018).

¹ Discussions with CLEAResult indicated that this number may change slightly as they clean up their database, but we feel that any small changes do not dilute the main take aways of this memo.

² The total number of employees may vary based on when the contractor registered as this value could change over time.

Figure 1. Year in which Active Contractor Joined the Program



Counties in which your active contractors work

Each contractor has a county that they call “home” and most work in more than one county. The contractors work in about four counties on average, but this varies from one to all nine counties.³ Alameda and Contra Costa counties have the most contractors working in their areas, at 65 each. At 33 contractors, Sonoma has the lowest number of contractors working in its county. (See Figure 2)

Figure 2. Home County of Active Contractors and Other Counties in Which They Work

		Home Counties										
		Alameda	Santa Clara	Contra Costa	Solano	Sonoma	San Mateo	Marin	San Francisco	Napa	Other*	Total
Number based in Home County		25	22	20	9	8	4	3	3	2	15	111
<i>Besides working in their own home county (highlighted in gray), the contractors also work in other counties shown below their home county</i>												
Counties in which Contractor Works	Alameda	25	9	16	3	1	2	1	0	1	7	65
	Contra Costa	23	4	20	7	1	1	1	0	1	7	65
	Santa Clara	12	22	2	1	1	2	0	2	0	6	48
	Marin	10	2	9	2	7	2	3	2	2	6	45
	Solano	5	3	9	9	2	1	1	0	2	10	42
	San Mateo	9	17	3	1	1	4	0	2	0	4	41
	Napa	5	1	7	8	7	1	1	0	2	6	38
	San Francisco	9	6	6	1	2	3	3	3	0	3	36
	Sonoma	5	1	3	4	8	1	2	0	2	7	33

Home counties of "other" contractors are: One each from El Dorado, Inyo, Mendocino, Placer, Santa Cruz, Stanislaus, and Yolo. Two are from San Joaquin and six from Sacramento.

³ 17 contractors work in only one county and 12 work in all nine counties.

Type of licenses held

All 111 contractors have a California license of one type or another (see Table 2).

Table 2. Number of Contractors with Specific California Contractor Licenses

License	Description	Number of Contractors	Percent of Active Contractors
C-20	HVAC	89	80%
B	General	48	43%
C-36	Plumbing	21	19%
C-2	Insulation	14	13%
C-10	Electric	11	10%
C-46	Solar	10	9%
C-17	Glazing	6	5%

Most contractors have a single license (57), but it ranges from 1 to 6 licenses within the company. Of the 57 contractors with a single license, most have a C-20 HVAC license (41), some have a B General Contractor license (13), and a few have a C-2 insulation license (3). One company has employees covering six contractor licenses.

Number with special BPI certifications

Many contractor companies (82) include BPI Certified staff, with from 1 to 11 staff holding the certification. Other BPI certificates available to a company included:

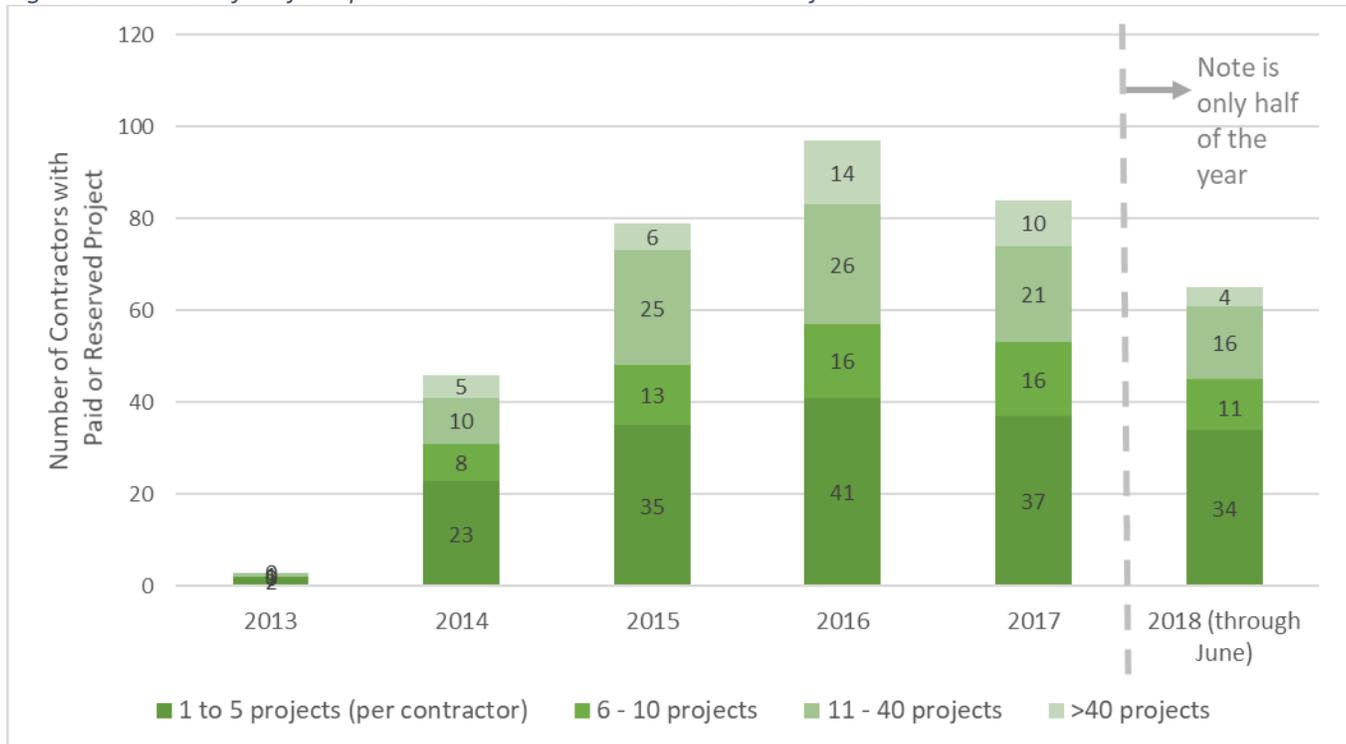
- BPI Envelope Specialist – 34 companies (31% of all contractors)
- Multi-family BPI Building Analysis – 10 companies (9% of all contractors)

Project Characteristics

How active have your contractors been over time?

Eight-eight of the 111 active contractors have a paid or reserved project in 2017 or 2018. Over time, your contractors tend to provide from one to four projects, although there are always a few companies with more than forty projects. (See Figure 3).

Figure 3. Number of Projects per Contractor over Time and Total Projects



The companies providing you with the largest number of projects (>40) typically have from 11-25 or 25-50 employees, although one company in 2017 had 51 projects and indicated having from 5 to 10 employees.

Contractors per County

Counting only single-family households (i.e., no multi-family) making over \$48,000 per year (the most likely set of households to participate in a Home Upgrade program and the type of household in which the contractors could market), Santa Clara has the highest number of householders per contractor and 58% of contractors who said they worked in Santa Clara County (shown Figure 2) have paid projects in 2017-2018 (see Table 3).

Table 3. Count of Contractors by County with Possible and Actual Number of Contractors

County	# of Households*	# of Contractors stated to be working in the County	# of HH / Contractor	# of Contractors providing 2017-2018 Paid Projects	% of all Contractors stated to be working in the County
Santa Clara	358,446	48	7,468	28	58%
Alameda	303,848	65	4,675	38	58%
San Francisco	145,705	36	4,047	5	14%
San Mateo	152,315	41	3,715	18	44%
Contra Costa	239,779	65	3,689	40	62%
Sonoma	109,067	33	3,305	13	39%
Solano	84,271	42	2,006	20	48%
Marin	65,496	45	1,455	12	27%
Napa	30,191	38	795	8	21%

*Household values from US Census PUMS data; 1-4 units in a house, household earns >\$48,000

What type of measures do your contractors install?

Across the 6,476 paid or reserved projects from 2013 through June 2018, the majority include duct measures (91%), furnace (85%), or insulation (72%), see Table 4.

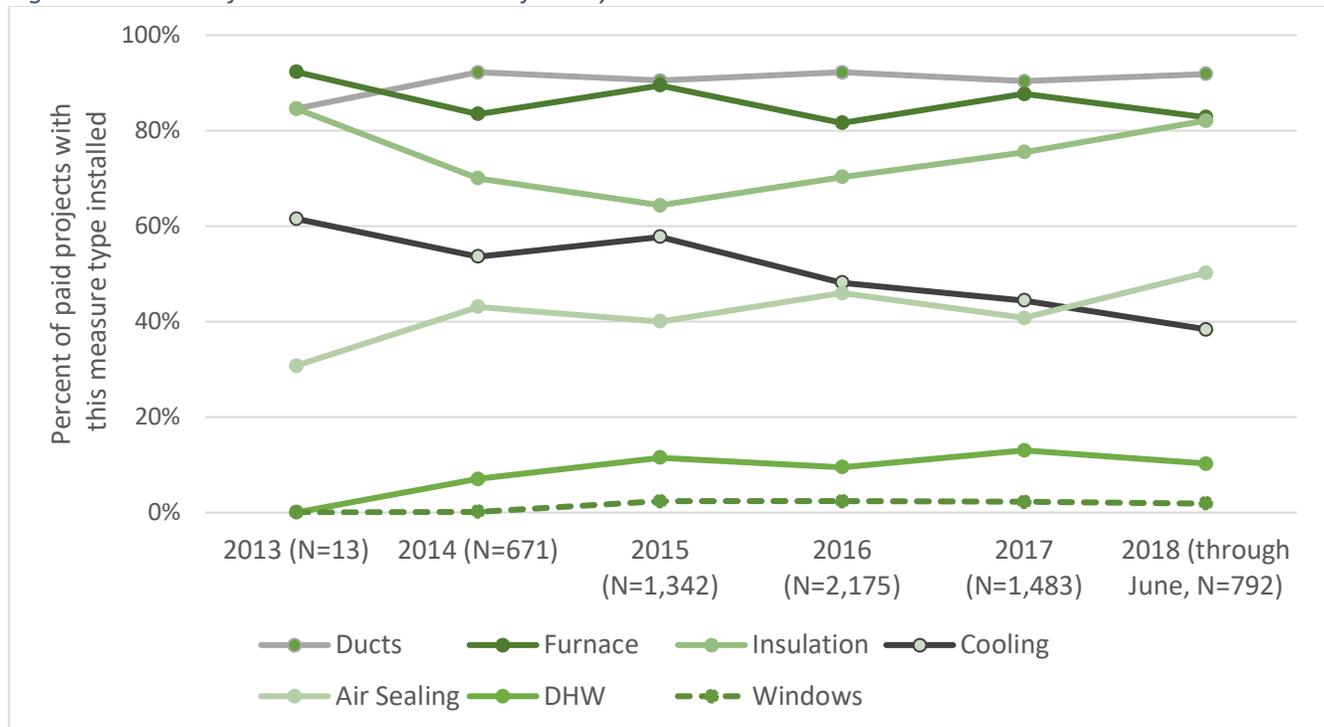
Table 4. Total Projects by Year and the Number of Projects by Specific Measures

Measure	2013	2014	2015	2016	2017	2018	Total	
Total Projects	13	671	1,342	2,175	1,483	792	6,476	
<i>Projects with these measures types</i>								<i>% of Total</i>
Ducts	11	619	1,214	2,006	1,340	728	5,918	91%
Furnace	12	560	1,201	1,775	1,300	656	5,504	85%
Insulation	11	470	864	1,529	1,120	650	4,644	72%
Cooling	8	360	775	1,048	659	304	3,154	49%
Air Sealing	4	289	537	999	604	398	2,831	44%
DHW		47	154	206	193	81	681	11%
Windows		1	32	51	33	15	132	2%
Thermostat						6	6	0%

Note: Ducts include only duct replacement and/or sealing; duct insulation resides in the insulation measure type.

Regardless the number of projects, DHW and Window measures have the fewest installations. (See Figure 4.)

Figure 4. Percent of Measures within all Projects by Year



Your contractors install an average of 3.8 measures per project, with a range from 3.0 to 6.3 depending on the contractor.

Customer Complaints of Contractors

There have been relatively few customer complaints about contractors. With close to 6,500 paid/reserved projects from 2013-2018, there have been only 186 complaints (2.8%). Over time, the number of contractor complaints have dropped. From a high of 78 complaints in 2014, there were only 17 complaints in 2017. Poor contractor communication is the most frequently described problem.

MEMORANDUM

To: Kellen Dammann, Dana Armanino Marin County

From: Mary Sutter and Jenn Mitchell-Jackson

Date: 9/11/18

Re: Contractor Findings



Contractors are a key part of many energy efficiency programs. They can help “scale” a program to reach more customers and are instrumental in ensuring the correct installation of energy efficiency measures. Program implementers have been working with contractors (or trade allies) for years and these implementers have a great deal of experience on what works. Additionally, evaluators have been collecting information that helps to understand barriers and improve program processes.

This memo provides information on contractors gleaned from an analysis of Bay Area population level data on contractor licenses, and a literature review of whole house and contractor-based studies.

The memo covers:

- **Number and Type of Contractors** – Specifics on numbers and types of contractors in the Bay Area who work with residential customers
- **Contractor Challenges** – Findings from our literature review on contractor barriers and challenges related to programs like Home Upgrade, and suggested solutions for overcoming those challenges
- **Long-term Engagement with Customers** – Considerations for moving to a program that engages with a customer over a longer period
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Number and Type of Bay Area Contractors

Key Take Away: *There are approximately 14,000 general or HVAC contractors based in the BayREN service territory. However, the program to date has disproportionately reached corporations: 34% of the population of contractors are corporations while 84% of the 111 participating contractors in Home Upgrade are corporations. If the program works best with the corporations, then there may be less than 5,000 general or HVAC contractors (the most active type of contractor in the current program) that could serve as a target. Overall, however, there are many more contractors in the market than are currently participating in the current program.*

We used the licenses held by the current group of 111 Home Upgrade contractors for our analysis of the population of licensed contractors within the nine BayREN counties. The seven licenses held by participating contractors include HVAC (C20), General (B), Plumbing (C36), Insulation (C2), Electric (C10), Solar (C46), and Glazing (C17). The two largest groups of participating contractors are HVAC and general: 80% of current BayREN contractors hold an HVAC license and 43% are general contractors.

The California Contractors State License Board maintains business licenses for 45 different classifications of contractors and an additional 33 limited specialty sub-categories.¹ The license database is at the business level

¹ Grounded Research purchased this database, requesting only those contractors with a mailing address within the nine counties that make up BayREN.

and unique to a company. However, because contractors can hold one or more licenses, a single business may show more than one license or specialty area. Some of the businesses in the database had a license that was suspended or inactive. Our analysis only looked at contractors with licenses in good standing.

The database is silent on the type of customers the business serves, but we know from a past study that 59% of C-20 contractors (the HVAC license) had the majority of their jobs in the residential sector.(EMI 2012) We estimated the number of contractors working in the residential sector by multiplying the total of contractors in good standing within each county by 59%.

We note that this reduction is based only on HVAC contractors and may be different for other contractors (i.e., those holding anything other than a C-20 license). However, lacking specific information about other contractors, we used the same value of 59% on all licenses.

Action Item	Action	Estimate of Unique Contractors
All licenses - original database value		45,551
All licenses- only Contractors in Good Standing	Reduce DB by 1,396	44,155
All licenses - estimated Residential Contractors	Multiply contractors by 59%	26,051
Seven licenses - only Residential Contractors in Good Standing	Filter to include only contractors with at least one of seven licenses	17,344

Our analysis only included the seven licenses that the current contractors held which reduces the number of contractors (as some do not hold one of these seven licenses). The table below shows number of licenses held by the 17,344 unique contractors. There are twice as many general contractors in the BayREN service territory than all other six licenses combined. And there are more companies holding an electric or plumbing license than holding an HVAC license. (See Table 1.)

Table 1. Estimated Population of Residential Contractors holding at least one of these License Types

License	Description	Estimated Residential Contractors holding this license (not unique)
B	General	13,120
C-10	Electric	2,820
C-36	Plumbing	1,729
C-20	HVAC	1,005
C-17	Glazing	330
C-46	Solar	156
C-2	Insulation	140

Table 2 shows the same non-unique contractor population, but by county. These are also separated into the two licenses that are held by the largest proportion of current contractors (i.e., those most likely to participate) and those licenses that have tended to have fewer participating contractors to date. Santa Clara, Alameda, and Contra Costa have the highest number of contractors in a county.

Table 2. Population of Estimated Residential Contractors by County and License Category

Business Address County	More likely to be main contractor for HU project		Less likely to be main contractor for HU project				
	General (B)	HVAC (C20)	Electric (C10)	Plumbing (C36)	Glazing (C17)	Solar (C46)	Insulation (C-2)
Santa Clara	2,546	257	578	327	57	32	25
Alameda	2,229	188	516	292	80	31	33

Business Address County	More likely to be main contractor for HU project		Less likely to be main contractor for HU project				
	General (B)	HVAC (C20)	Electric (C10)	Plumbing (C36)	Glazing (C17)	Solar (C46)	Insulation (C-2)
Contra Costa	2,015	187	406	237	54	26	28
San Mateo	1,516	106	330	231	38	7	8
Sonoma	1,487	98	305	180	28	25	21
San Francisco	1,475	59	331	262	34	11	7
Marin	980	30	150	89	15	14	6
Solano	515	63	130	73	18	9	11
Napa	357	18	74	39	5	3	1
Total	13,120	1,005	2,820	1,729	330	156	140

However, because a unique company can hold multiple licenses, simply summing the totals by license overestimates the potential number of residential contractors. We include the number of unique companies in Table 3 and the totals for those holding either a General contractor or HVAC contractor license.

Table 3. Population of Estimated Unique Residential Contractors by County

Business Address County	Unique Companies with any of seven licenses	Unique Companies with either a B or C20 license
Santa Clara	3,414	2,740
Alameda	2,985	2,366
Contra Costa	2,680	2,165
San Mateo	1,990	1,595
Sonoma	1,991	1,575
San Francisco	1,882	1,513
Marin	1,192	1,004
Solano	746	568
Napa	463	371
Total	17,344	13,897

While the state license database has no indication of number of employees in a company, the business type that is provided gives a sense of the possible numbers. As shown in Table 4, close to two thirds of all companies are sole ownership, meaning that there is likely a small(ish) number of employees. The percent of sole ownership varies by county from a low of 55% in San Francisco county to a high of 71% in Solano county.

Table 4. Business Type of Unique General and HVAC Residential Contractors by County – Estimated Population

Business Address County	Unique Companies	Sole Ownership	Corporation	Other*
Santa Clara	2,740	58%	39%	4%
Alameda	2,366	61%	35%	4%
Contra Costa	2,165	64%	32%	3%
San Mateo	1,595	61%	36%	3%
Sonoma	1,575	70%	27%	3%
San Francisco	1,513	55%	41%	4%
Marin	1,004	68%	31%	2%
Solano	568	71%	26%	4%

Business Address County	Unique Companies	Sole Ownership	Corporation	Other*
Napa	371	68%	29%	3%
Total	13,897	62%	34%	3%

* Joint Venture, Limited Liability, Partnership

While 62% of the population of contractors are sole ownerships, only 13% (14) of the 111 participating contractors are sole ownerships and 84% (93) are corporations. Interestingly, though, while the sole owners mainly have under 5 employees, the corporations had a relatively equal split of employees (see Table 5).

Table 5. Business Type and Number of Employees of Participating Contractors

Business Type	N	Number of Employees				
		1-4	5-10	11-25	25-50	Over 50
Sole Ownership	14	57%	21%	21%	0%	0%
Corporation	93	23%	28%	26%	15%	9%
Other	4	75%	0%	0%	0%	25%
Total	111	29%	26%	24%	13%	8%

Regardless, the current program appears to appeal to or draw mainly from corporations. This may be a good target since these contractors may serve more customers. Notably, targeting corporations would reduce the number of possible contractors further.

In the future, BayREN may wish to explore why there are more corporations than sole ownerships within the program, what the interest level is in each group, and which types of contractors might be the best fit for the program.

Contractor Challenges and Potential Solutions

Key Take Away: *Generally, the documents found in the literature indicate that program designs need to align with a contractor’s business model or provide sufficient rewards to overcome barriers. This includes making it easy for contractors to participate by simplifying paperwork and program requirements. Lessons learned from other programs show that it may be helpful to incent contractors directly (i.e., contractor spiffs), actively educate contractors about what is required of them, and help contractors effectively sell upgrades to customers. In addition, programs instituted QA/QC procedures and thoughtfully considered how to engage and train contractors. Maintaining a network of participating contractors was typically intentional and considered multiple ways to both help contractors be successful, and deal with less successful contractors.*

We reviewed the literature to understand the challenges and potential solutions associated with working with contractors. Overall, the literature supports that program design needs to align with a contractor’s business model or provide sufficient rewards to overcome any resistance to be most successful. (Grevatt 2017) Time spent on dealing with program requirements is time that a contractor is not spending on ensuring their own profitability, so how long things take is an important consideration in all aspects of program design. A program may also need to help contractors understand the value of energy efficiency and how to sell it to customers.

In addition, it is also clear that maintaining a network of participating contractors should be intentional and needs to consider the multiple ways to continue to engage contractors and keep them enthusiastic about a program as well as how to handle less successful contractors. These maintenance activities are sometimes undertaken by a utility and sometimes by a third-party the utility engages for that purpose.

It is also important, however, to realize that contractors are only one piece of the puzzle. A meta-analysis of 134 programs² found that successful program designs had six different conditions. Ensuring strong contractor interactions was one important condition. In addition to thinking about contractors, however, successful programs must also ensure that: 1.) The market potential for energy savings is sizable. 2.) The technology being promoted is reliable. 3.) The “right” participants are engaged (the ones for whom the opportunity is sufficient from the program’s perspective). 4.) The program works financially and “emotionally” for participants (meets their values in some way), and the process is not overly burdensome. 5.) The savings are verifiable. (Grevatt 2017). While our memo focuses on meeting contractor challenges, we note these additional conditions upfront for the reader so that they understand that contractors are only part of any program design. However, it is critical to ensure that the program design overcomes the barriers and challenges associated with contractors.

Contractor-Related Challenges Identified in Other Programs

Based on the literature, there appear to be two major barriers for contractors: (1) they don’t have the time to spend on the program, and (2) they don’t understand the value of the program to them *or* to their customers.

For many contractors, program participation can be hard. They don’t have time, and yet the program requires them to spend time training on the program, as well as take extra time to explain issues to customers.

Completing program requirements, such as audits and paperwork, can also take time. Many whole house programs have very complex forms and data requirements.

It is also difficult for contractors to fully understand the value of the program to their business (especially since it takes up their time), and it is difficult for them to explain whole house type programs—which tend to be complex programs—to customers. There is a need to make it easy, while also piquing their interest to ensure that they remain an active participant (i.e., that they have the incentive to participate).

Similar programs have also run across QA/QC challenges working with contractors, and challenges finding the best ways to engage with contractors. These programs have found that it is important to ensure high quality work. They have also tried multiple methods to move towards more successful forms of ongoing engagement with contractors. While not every lesson is transferrable, we share some of the lessons learned from other areas of the country when dealing with contractors.

Solutions from Other Areas of the Country (Lessons Learned)

Through our literature review, several programs have discussed ways to make contractor participation easier, pique or maintain contractor interest in the program, ensure quality, and engage with contractors over the long-term.

Ways to Make Contractor Participation Easy

- **Simplifying paperwork and program requirements.** Paperwork issues are a well-known challenge for many programs. While simplifying paperwork is commonly something that is discussed in the literature, there are few details on the exact nature of the problem, or what was cut to shorten forms, etc. Two utilities described the importance of continuously reviewing paperwork and program processes so that they could keep the program streamlined.
 - NYSERDA made changes to their website and printed materials that, within 60 days, reduced paperwork requirements and simplified applications (among other benefits). Although the specific improvements were not described in the literature, they bulleted out the internal process they used during the 60 days. (US DOE 2017). Specifically, NYSERDA implemented the following improvements:

² The meta-analysis included 62 comprehensive whole house retrofits, 17 direct install, and 55 HVAC replacement and early retirement programs.

- Created simple, concise language on website and printed materials
- Simplified applications to remove questions with little value
- Reduced paperwork requirements
- Reduced audit application times from 3 days to 1
- Reduced project approval times from 8 days to 1
- Identified additional changes beyond 60 days
- Increased approval rates on loans
- EmPower in New York used a different internal process (called LEAN) to change and improve their program. (US DOE 2017) Specifically they:
 - Reduced project lifecycle from an audit to an approved project by 7.5 days
 - Reduced project approval processing times by 30%
 - Improved paperwork quality rate from 69% to 93%
 - Reduced payment time from 35 days to 7 days.
- Build It Green’s California whole-house program was able to reduce administrative time to review rebated applications by 48% per project and reducing reporting burden on contractors by 27% in average application submission time and 20% in average energy modeling time and well as improving contractor satisfaction in the program by 28%. They moved to cloud-based software (Salesforce), parsed data and auto-populated from transparent, standardized energy modeling output (HPXML). (AESP Brown Bag 2016)
- APS also improved their processes by allowing contractors to choose their own modeling software and moving to a cloud-based system that pre-populated some of the tedious program requirements. (AESP Brown Bag 2016)
- An example of how simplification can play out in the market is shown when contractors indicated a preference for PACE over REEL when considering financial programs. PACE was desired due to a simpler application and easier qualification process. Additionally, PACE often compensated contractors \$250 for generating leads. (Opinion Dynamics 2017)

Helping Contractors See the Value of the Program (to them and to customers)

- **Incenting contractors directly (i.e., contractor spiffs).** A retrospective assessment showed that besides simplifying forms, paperwork was more acceptable to contractors if they received an incentive directly.
 - Process evaluators found when contractors (trade allies) were able to receive the incentive payment directly, rather than the incentive going to the consumer, they tended to be more willing to complete the paperwork and meet other program requirements. The authors indicated that there are risks in doing this, but inspections and quality assurance oversight can be used to manage the risk and improve the ability of the program to deliver savings (Peters 2009).
 - Another study presented lessons learned from years of working with trade ally networks and the result of a nationwide survey about influential tactics. They reported that the top areas that influence trade ally sales are 1) increasing customer incentive levels; 2) performance bonuses; and 3) comprehensive program driven awareness campaign (Rivera 2015).
- **Actively working to help contractors understand what is required of them.** Contractors often don’t have the information that they need to really understand (and sell) the program. At times, they may also have misinformation.
 - In a 2016 study that conducted in-depth interviews with non-participating contractors in California, some perceived that they must be able to perform sophisticated whole home modeling (which is not specifically part of the Home Upgrade program), which is a barrier to looking further into how their business could benefit from participating in the program. (EMI 2016) To help contractors understand the program, the IOUs planned to streamline contractor marketing materials and

- support contractors more. The IOUs also planned to provide fact sheets on the contractor website and contractor portal. (Joint California IOUs 2016)
- The same study found that many contractors simply did not understand the time commitment required to participate. (EMI 2016) In the IOUs response, the IOUs agreed to continue clearly communicate program time commitments to new contractors. (Joint California IOUs 2016)
 - Training on program rules and procedures can help contractors participate. (Peters 2009)
 - **Helping contractors effectively sell upgrades to customers.** A 2016 Energy Upgrade California evaluation found that 25% of contractors indicated that they experienced marketing and sales benefits as a result of their participation (EMI 2016). However, several studies have found contractors may need training on how to communicate information to customers – especially as the program becomes more complex. There may be a need for training in sales and marketing to teach contractors the skills needed to communicate the importance of a whole-house approach.
 - One California-based study found that contractors had difficulty with the value of energy efficiency and how to communicate that value to a homeowner (Opinion Dynamics 2016) and another found that non-participating contractors believed that customers primary motivation is to minimize up-front costs (EMI 2015). This can be a large barrier for a whole house program as contractors must be able to educate homeowners and communicate the benefits of a whole-home approach to energy efficiency to beat out their competitors—especially since the program often leads to additional overhead costs for the project that could make them less competitive (Zimring 2010).
 - In California, participating contractors want more straightforward and less technical information they can provide to potential Home Upgrade customers. These contractors thought that the SCE/SCG Home Upgrade Digest was a good example of straightforward material (EMI 2016). We include this Home Upgrade Digest document as a separate PDF along with our memo.
 - Some programs are specifically offering training in this area. NYSERDA offered a one-day training in sales and marketing to teach contractors the skills needed to communicate the importance of a whole-house approach (Zimring 2010). This training appears to have worked as the penetration of the whole house program (HPwES) grew from 0.5% to 3% annually at the time of the study (Zimring 2010).

Ways to Ensure Quality

- **Assuring quality through multiple QA/QC processes.** Many programs have found a need for QA/QC processes and actively managing program activities to improve satisfaction.
 - Oncor (a Texas utility) adjusted their contractor network (for an unspecified program) after they were seeing gaming of the system, customer confusion, high inspection failure rates, and running out of funds within six months. They took several incremental steps and reviewed what happened after each. Specifically, Oncor first instituted new requirements (certified professionals, customer service training), penalty flags (3 strike policy, on-site post testing, contractor terminations), and feedback and recognition efforts (contractor appreciation luncheon, customer feedback surveys). They then made deeper changes: 1) promoted partnerships through on-site visits by program managers, pre-designed marketing materials, 2) open door policy for talking with contractors, aligned their residential programs, and 3) creating performance rankings and reserving funds, 4) new in-depth application process with in-person interviews and contractor presentations, 5) provided “expectation trainings”, and 6) high quality meant more reserved funding for the contractor. Ultimately Oncor found that their changes provided high customer satisfaction, fewer (presumably more successful) contractors, lower failure rates, improved contractor communications and partnerships, improved contractor satisfaction with programs, and reduced confusion (Brown 2015)

- APS also encountered inspection failures and described how contractors left their HPwES program after becoming frustrated with inspection failures. To overcome this, they used an NREL product to help show high quality work and consistently trained all contractors on the product. APS also provided contractors with quarterly scorecards and ranked contractors in their performance. APS had 35-40 active contractors with 44% conversion rate and all contractors between 8.83 and 9.96 (out of 10) in terms of quality. (U.S. DOE 2017)

Ways to Engage Contractors

- **Creating and structuring your Trade Ally Network.** Creating a formal trade ally network includes several avenues for ongoing communication between the program and the contractors. Often working directly with contractors was viewed as being most successful. Past California evaluations have found that California-based contractors have had difficulty operating across multiple utility territories because of the administrative differences across programs, and suggested consistency (where possible) and that contractors be educated about differences where it was not possible to be consistent. The IOUs, however, responded that due to climate zone differences, regional differences, and single fuel utilities, the IOUs are not able to be consistent. They also rejected the recommendation because so few contractors work in multiple territories. This is something that BayREN should be aware of, however, since their contractors may also work with PG&E and local government programs.
 - To connect to contractors, one program with a formal trade ally process included an annual appreciation lunch, round tables and advisory panels as well as over 30 annual technical training and networking events (attended by over 1,500 customers and contractors). Additionally, they have a dedicated website for only the trade allies, an internal-facing data portal where each individual trade ally could see all their projects, and an external-facing directory of Designated Trade Allies that customers could see. (Clemens 2016)
 - Another third-party specifically working with trade allies within a grocery program supported their trade allies in three- pronged approach: Get to Know (breakfast meetings between trade allies and suppliers), Tell (1:1 meetings), and Show (on-site installation trainings). They found that the breakfast meetings took a bit to get off the ground but were the most successful for the program (Whitehurst 2010).
 - Programs like BayREN programs that cross over territories with other gas, electric, and local programs can also be challenging to explain to customers given the multiple options (and program administrators) in the market. Bonneville Power Authority (BPA) encountered a similar challenge and created a formal trade ally network (TAN) to deal with this issue. BPA has an energy efficiency mandate and their service area includes multiple utility programs within a small geographic area. The firm hired by BPA to manage the BPA TAN performed regional roadshow trainings and provided live support to contractors. They also maintained a website and newsletter for contractors as well as facilitating sessions with utility representatives around consistency of program efforts. BPA found that it worked best to 1) prioritize helping contractors connect with different utility programs instead of merely presenting a single program, and (2) highlight commonality across programs rather than dwelling on differences between programs. BPA was so successful that they began to focus on quality of contractors rather than quantity. (Hartwell 2010)
 - Several studies also mentioned internal feedback loops to get input from contractors and adjust (Beley 2014, among others)
 - Energy Trust of Oregon made several program changes related to how they interact with trade allies.
 - They moved to an account management model – A single point of contact who provides program guidance, mentorship and support for trade allies. The evaluation suggested that

Energy Trust consider further tailoring communications to reflect trade allies' unique businesses, level of program activity, star rating, geography, and/or target market.

- They created Instant incentives – A process by which contractors deduct the incentive amount directly from a customer's bill, carrying the cost of the incentive until receiving reimbursement from Energy Trust. The assessment found that most trade allies who qualified to offer instant incentives had used them to varying degrees, but the perceived benefit of them was mixed.
 - They updated their Web forms – The option for trade allies and customers to submit incentive forms online along with a Trade ally portal – A web-based repository of information where trade allies can log in and view project details for all of the active and completed projects they have submitted for an incentive, as well as access program forms;
 - They used a Newsletter/blog – An information source called Insider that provided both general information to all trade allies, as well as specific information on program offerings, market-related topics, tips and education, but the evaluation found that trade allies were not consistently using or aware of the tools. The study recommended that Energy Trust continue efforts to reach out individually with trade allies to raise awareness of the availability of marketing tools and information resources. Additionally, for Energy Trust to explore opportunities for expanded trade ally training and mentorship on the availability of tools such as cooperative marketing funds, the booklet of measure incentive information, and website development funds. While many trade allies take full advantage of the suite of offerings, others remain unaware of the tools, or do not utilize them.
- **Creatively fitting program training into contractor schedules.** Finding the time to attend trainings can also be problematic, yet training is a large part in ensuring that contractors understand a program and how to deploy it well.
 - In the literature, some of the activities to try to overcome this constraint (i.e., finding time for training) included: providing trade ally breakfasts, including multiple technical trainings in a year, scheduling trainings through webinars and in-person locations that are accessible (multiple sources).
 - Notably, one financing-based study found that California-based contractors were not interested in video-based training (Opinion Dynamics 2017). This same study also indicated that video-based training can be costly, requiring program resources.
 - Several studies also mentioned concierge-type efforts that allow contractors to ask questions and seek out the specific training or information that they need at the time that they need it. (Beley 2014; Opinion Dynamics 2017).
 - One program also found that they were more successful after focusing communications (and training) specifically on certain contractors (e.g., high impact/high potential companies) because they found that they spent way too much time with contractors who weren't producing for the program. (Beley 2014)
 - In one study, expert panelists also recommended encouraging, but not requiring, training. (Opinion Dynamics and Advent Consulting Associates 2016)

While it is important to look for ways to make existing programs easy, it is also important to understand that implementing any changes can also be hard. Keeping up with changes can be difficult for contractors. Past programs have encountered issues with trying to keep contractors engaged as the program changes. Constantly changing program details can undermine a contractor's business model and create an impression of contractor risk which can cause contractors to shy away from a program or drop out if already participating. Adding in new requirements that introduce higher labor costs can also threaten profitability and be a participation barrier. Any changes, and the timing of those changes, should be well thought out.

In the future, BayREN may wish to explore the New York (NYSERDA and Empower New York) examples to see if additional details are available on how to cut down on paperwork.

Long-term Engagement with Customers

Key Take Away: *A good concept to explore directly with contractors is their level of interest in growing a network of homeowners they follow up with over time. If interest is low, the program may need to consider whether it is best to keep the continuous customer engagement with their own staff.*

BayREN was interested in understanding if the findings described above would change for a program that seeks to obtain savings from multiple measures that are installed over time within a household rather than requiring many at the same time. We describe findings related to this area below.

When asked if contractors would prefer a single program with multiple measures or multiple stand-alone programs each with separate energy efficiency measures, most contractors stated that a single program with multiple measures makes more sense, pointing to the importance of focusing on the house as a system and the need to understand how different measures work together. In addition, one contractor said, “Whenever you are performing an in-home service— you want it under an umbrella of one program—rather than running an aerator program, a showerhead program.” (Cadmus and NMR 2011).

It is possible, however, to stretch the installation of these measures out over time. There does appear to be some customer interest in a longer-term relationship. As part of the survey Grounded Research did with single family moderate income households within the BayREN service territory, 44% expressed an interest in help putting together a plan to save them on energy bills over the next five years and 46% liked the idea of free access to an expert to help them find the best ways to save energy.

One study discussed how their program was moving towards bringing HVAC contractors into whole-house programs because they have long term maintenance agreements with households (Warren Energy Engineering 2017). As noted in our earlier memo regarding the make-up of the current BayREN contractors, the BayREN program most frequently pulls in contractors with an HVAC license (80% of participating contractors have this license), followed by general contractors (43% of contractor companies have this license). Generally, in California, 84% of HVAC contractors indicate doing some jobs considered maintenance efforts. For most of these (97%), maintenance jobs are less than 50% of all their jobs (EMI 2012). While it appears that HVAC contractors do maintain a longer-term relationship with their customers, the business of HVAC contractors is to install and maintain HVAC equipment, not a broad type of measures. These contractors would need to expand their services or create partnerships while continuing to be profitable. Learning how to sell and price a new service or how to structure a profitable partnership would take time and would most likely be a risk to the HVAC business and therefore may work well only with larger companies who can sustain a dip in revenue if it occurs. (See Liaukus, 2012 for 15 areas that an HVAC contractor needs to think about when transitioning to be a whole house contractor.) Conversely, a general contractor is often used to working with multiple sub-contractors who provide different services and may have some of the “soft skills” needed to work with multiple other contractors. Whether either of these types of contractor would be interested in growing a network of homeowners they follow up with over time is unclear and would be a good concept to explore directly with contractors.

If contractors were asked to take on this role, any program design would need to carefully consider the needs of a contractor’s business to bring contractors into a program and keep them working with a program. Program staff may also want to consider whether using contractors as the point of contact for ongoing communication

with households will be in the best interest of the program. It is possible that customers may desire continual contact with an organization whom they feel is less worried about selling them something. Energy Advisors could also take on this commitment as they may be the natural point person if they were originally involved with the customer. Additionally, if the ongoing communication stays with the program (or an Energy Advisor), then the program will have more control over messaging.

In the future, options for longer-term engagements with customers is an area that BayREN should consider exploring through primary research efforts.

Potential Future Research with Contractors

This research brought out a few areas where follow-up with contractors in BayREN’s service territory would be beneficial to designing a future program. We know that CLEAResult may be performing several focus groups with contractors. In addition, Grounded Research could also field a survey or conduct interviews with participating and/or non-participating contractors.

We outline suggested areas of inquiry below. It may work well for CLEAResult to consider all research questions through focus groups first before any survey data collection. Grounded Research could work closely with CLEAResult, if needed, on these areas.

Area	Research Question	Data Source	Potential Data Collection Activity
Number and Type of Contractors	What types of contractors might be the best fit for the program? How can the program appeal to a broader group of contractors?	Non-participating contractors (may include looking at sole-owners with HVAC or General licenses v corporations)	Focus Groups
	What program benefits would attract new contractors to the program?	Non-participating contractors	Survey
Contractor Challenges	What solutions would be most effective at overcoming paperwork challenges specific to the Home Upgrade program?	Participating contractors	Focus Groups
	What training efforts would be most acceptable to contractors (e.g. modality, timing, location)?	Participating contractors	Survey
Long-term Engagement with Customers	What, if any, are good program designs for helping set up continual engagement with customers by the contractor?	Participating contractors	Focus Groups
	What is the contractors’ level of interest in growing a network of homeowners they follow up with over time? Does it vary by type and size of contractor?	Participating and Non-participating contractors (with HVAC or General licenses)	Survey

Attachment 1: Description of the Home Performance with ENERGY STAR Program

Outside of California, other utilities include a whole building program like Home Upgrade called Home Performance with ENERGY STAR (HPwES). The federal government provides information that, while specific to HPwES, can be relevant to the California Home Upgrade program. We provide a few of these resources in the companion to this memo – our annotated bibliography.

According to the Department of Energy’s (DOE) website, “Home Performance with ENERGY STAR offers whole-house solutions to high energy bills and homes with comfort problems. The program is managed by a local sponsor that recruits home improvement contractors who are qualified to perform comprehensive home assessments. The assessment includes the heating and cooling systems, windows, insulation, flow of air into and out of the house, as well as a safety check of gas appliances. Based on this assessment, participating contractors offer solutions to fix comfort problems and address high energy bills.”³ HPwES has a network of over 40 local programs and 1,500 home improvement contractors.

Additionally, the DOE maintains a site with step-by-step guidance, tips, and resources to start a program or make program changes. Better Buildings (another DOE program) maintains a residential network connecting energy efficiency programs and partners to share best practices and learn from one another to increase the number of homes that are energy efficient. Build it Green (the Advanced Home Upgrade implementer for PG&E) is a Better Buildings Accelerator Partner.

A recent overview of the HPwES program found that there is a shift to get more HVAC contractors participating in home upgrade programs because these contractors have long-term relationships with customers through their maintenance agreements. The authors indicated that this strategy may lead to more comprehensive retrofits. (Warren Energy Engineering 2017) Another author listed several guidance documents for any HVAC contractor transitioning to becoming a whole house contractor (Liaukus 2012). A few examples were: technical training; conducting on-site customer interviews; assessing whole-house performance; and customer package presentation.

³ https://www.energystar.gov/index.cfm?c=home_improvement.hpwes_sponsors_about

Annotated Bibliography for BayREN Residential Contractor Research



Pictures from BayREN's website

Prepared for:
BayREN Single Family Team

Prepared by:
GROUNDED
— RESEARCH AND CONSULTING —

Date:
August 22, 2018

Introduction

BayREN's Home Upgrade team contracted with Grounded Research and Consulting, LLC to perform a quick turnaround study that would help them understand the market of available contractors for their residential programs.

This annotated bibliography provides the results of Grounded Research's literature review, which focused on exploring the type of contractors and barriers experienced by contractors in the California Home Upgrade program and similar programs outside of California. BayREN is specifically interested in learning how other programs handle paperwork and any good approaches to streamlining the needed contractor paperwork. We also included general program implementation information and resources as seemed relevant.

This document is a companion piece to the literature review memo.

Grounded Research used some, but not all, of the information from the listed documents in the memo. This bibliography summarizes the reports we reviewed, but each is not specifically called out within the memo. However, each document listed in the bibliography provides some information on contractors working in Home Upgrade-like programs.

Annotated Bibliography

1. AESP Brown Bag. 2016. *Innovations in Process to Accelerate Home Upgrade Programs*. (PPT of Brown Bag not available unless an AESP member)
 - This Brown Bag webinar describes the DOE Better Building Home Upgrade Program Accelerator and what two HPwES accelerator partners (APS and Build It Green) did to deliver results and improve contractor relationships.
 - APS improved their software by moving to a cloud-based software and allowed contractors to choose their own modeling software. Their key take aways were:
 - Whole house programs cannot exist without good contractors.
 - Good contractors need to be profitable.
 - Good contractors need consistent training
 - Designing and evolving programs should be done with contractor input, and with their perspective in mind.
 - Build It Green also moved to cloud based software (Salesforce), parsed data and auto-populated from transparent, standardized energy modeling output (HPXML)
 - Indicated that they reduced administrative time to review rebated applications by 48% per project and reduced reporting burden on contractors by 27% in average application submission time and 20% in average energy modeling time and well as improving contractor satisfaction in the program by 28%.
2. Beley, A. 2014. *Build It Green: What Works, and What hasn't?* Build It Green (BIG) Presentation.
 - BIG developed a strategy to focus on high impact/high potential companies because they found that they spent way too much time with contractors who weren't producing for the program. Their strategy includes "lots of interaction!" including:
 - Consistent, scheduled training both through webinars and in-person at locations that are accessible
 - Account managers/consistent touch points with contractors
 - Customized concierge mentoring for a select group of companies
 - Internal feedback loops to get input from contractors and adjust
 - They also mentioned that the software and program tracking was not easy for contractors to use because it requires a lot of time/expense and has limited transparency on the pipeline for a contractor's project. They were working on simplifying and making software more transparent.
3. Brown, Carl. 2015. *Cream of the Crop: Managing a Saturated Market*. AESP Brown Bag. (not available electronically unless an AESP member)
 - The slide deck describes how Oncor (out of Texas) adjusted their contractor network after they were seeing gaming of the system, customer confusion, high inspection failure rates, and running out of funds within 6 months.
 - Oncor first instituted new requirements (certified professionals, customer service training), penalty flags (3 strike policy, on-site post testing, contractor terminations), and feedback and recognition efforts (contractor appreciation luncheon, customer feedback surveys).
 - They then made deeper changes: 1) promoted partnerships through on-site visits by program managers, pre-designed marketing materials, 2) open door policy for talking with contractors, aligned their residential programs, and 3) creating performance rankings and reserving funds, 4) new in-depth application process with in-person interviews and contractor presentations, 5) provided "expectation trainings", and 6) high quality meant more reserved funding for the contractor.

- Results indicated high customer satisfaction, fewer contractors, lower failure rate, improved contractor communications and partnerships, improved contractor satisfaction with programs and reduced confusion.
4. Cadmus Group and NMR. 2011. *Process Evaluation: New Hampshire Home Performance with ENERGY STAR® Program*.
<https://puc.nh.gov/Electric/Monitoring%20and%20Evaluation%20Reports/124%20NH%20HPwES%20Impact%20Evaluation%20Report%20June%202013%202011.pdf>
- This program incented hot water measures such as showerheads and tank wraps, low cost electrical measures such as CFLs, and thermal packages that included insulation, air sealing, duct sealing, and an electronic thermostat with set-back. Contractors evaluated the HVAC system as part of their audit, but recommended that the homeowners manage that directly with a HVAC contractor (i.e., it wasn't part of this program).
 - Contractor information was based on 8 interviews.
 - Contractors said that rebates and financing were the programs greatest strength (the program appears to use on-bill financing).
 - When asked if they would prefer a single program with multiple measures or multiple stand-alone programs each with separate energy efficiency measures. Most contractors stated that a single program with multiple measures makes more sense, pointing to the importance of focusing on the house as a system and the need to understand how different measures work together. In addition, one contractor said, "Whenever you are performing an in-home service— you want it under an umbrella of one program—rather than running an aerator program, a showerhead program."
 - Five out of eight contractors mentioned concerns about the prices set by PSNH and Unitil for the energy efficiency measures.¹⁵ Two said that there is not enough profit-margin when work is subcontracted; once the 10% administrative fee is paid to the contractor, there is little money left for the subcontractors.
 - Some contractors reported that 14% to 90% of their business was through this program both others said it was only a small percentage of their work and that their work may not decrease by much if the program were to close.
 - At the time of this study, 33 states offered HPwES programs and the study reviewed seven programs for their meta-analysis.
 - Four of the seven other programs had market transformation as a primary objective, the others were for resource acquisition.
 - Contractors incur costs as a result of participating in home performance programs, including the costs of diagnostic equipment, training, and time taken off from work to attend training sessions and perform other required tasks. The direct out-of-pocket cost of obtaining BPI certification was identified as a barrier to contractors participating in both NYSERDA's HPwES and Ameren Illinois' Home Energy Performance program. NYSERDA addressed this barrier by offering a 75% cost reimbursement for the training. The ETO program provided incentives for contractor training during the first year of participation. However, recognizing that one year may be insufficient for contractors to adjust their business models, the ETO process evaluator recommended extending first year contractor incentives into the second year or moving some of the first year incentives into the second year in order to allow for a longer start-up time for contractors. In New Hampshire, the utilities have subsidized BPI courses through their education program budget and program staff indicate that this was effective in reducing the cost to contractors. One contractor was proud to note that he was invited to participate in the program and take courses through BPI as such an invitation reflected well upon his skills.
 - While technical field training is critical to program success, training in home performance program incentives and marketing should not be overlooked. Finally, contractor training should be performed as frequently as necessary to ensure quality work.

5. Clemens, William J. 2016. *DTE Energy's Designated Trade Ally Program*. AESP Spring Conference. (not available electronically unless an AESP member)
 - This slide deck includes information about the DTE C&I trade ally program but is relevant for their discussion about value of a formal trade ally program.
 - Their formal trade ally program included a dedicated program website for the trade allies, data portal where the trade ally could see all their projects, and an online directory of Designated Trade Allies that customers could see.
 - The trade ally website includes training videos, program announcements, funding gauges, events and registration, marketing materials, program applications, and the data portal.
 - The data portal can be accessed by trade allies via their own log-in ID and password so they can see all their projects.
 - DTE also offered bonuses, quality application bonus, annual appreciation lunch, round tables and advisory panels, quarterly e-newsletter, first notice of all program announcements and funding updates, LinkedIn group, and over 30 annual technical training and networking events.
 - DTE tracks and reports on trade ally performance annually.
6. Clendenning, G., D. Barclay, L Hoefgen, J. Peters, M. McRae, E. Vine. 2013. *Better Building, Better Market Effects? Estimating the Market Effects of the Better Buildings Neighborhood Program*. 2013 International Energy Program Evaluation Conference, Chicago.
 - This paper reported on an evaluation that included 151 non-participating contractor interviews. Key findings included that the Better Building Program had a positive impact on the marketing of energy efficiency by both participating and non-participating contractors. It also helped increase the availability of trained contractors.
7. Cluett, R and J. Aman. 2016. *Scaling Up Participation and Savings in Residential Retrofit Programs*. ACEEE
 - This program did not focus on contractors but mentioned that programs can make administration easier and less time intensive for participating contractors by adhering to Building Performance Institute (BPI) standards for data collection and transfer (sometimes called HPXML). This allows contractors to transfer necessary project data to a program administrator without having to use a specified modeling tool or software that they may not be familiar with.
8. EMI. 2012. *California HVAC Contractor and Technician Behavior Study*. CALMAC Study ID SCE0323.01 http://www.calmac.org/publications/CA_HVAC_Behavior_Study_FinalReport_2012Sept14_FINAL.pdf
 - While somewhat dated, the study documents a bit on existing contractor business models (although not much), specifics on contractor and technical experience with, interest in, and barriers to participating in a utility HVAC maintenance/installation program. It also developed a sampling frame of this group.
 - The study covered HVAC contractors with a C-20 license working in the residential or commercial sectors
 - At the time of this study, there were 8,210 unique firms with C-20 licenses (but about one-third of the state license list of C-20 contractors were unreachable by phone due to disconnections, wrong numbers, or simply not answering).
 - 59% of C-20 contractors have over 61% of their jobs in the residential sector.
 - While 84% of C-20 contractors do some work in maintenance, 97% of active contractors reported that maintenance jobs are 50% or less of their jobs, 37% indicated that more than half of their jobs are service-oriented, and 27% indicated that more than half of their jobs are installation work.
 - Most (66%) have 1-4 employees

- 64% of contractors have a formal policy for following up with customers after an installation job. Phone calls were the most frequent means (29%), maintenance agreements (22%) and maintenance follow-ups (19%) were the next most common ways of following up after an installation job.
9. EMI. 2015. *California HVAC Contractor and Technician Behavior Study, Phase II*. CALMAC Study ID SCE0375.01 [http://www.calmac.org/publications/HVAC C%26T Behavior Phase2 FINAL REPORT.pdf](http://www.calmac.org/publications/HVAC_C%26T_Behavior_Phase2_FINAL_REPORT.pdf)
- This study is a follow up to the 2012 EMI study and researched how HVAC contractors used industry standards for HVAC installation and maintenance.
 - The information in this study is focused on Quality Installation and Quality Maintenance (QI/QM) and therefore, less relevant for our purposes of understanding HU contractor experiences.
 - The study collected information from 26 contractor interviews. 11 of these were with contractors participating in the QI/QM program and 15 were from non-participating contractors. It is noteworthy that they planned to gather information from 40 contractors but were able to complete only 26. Their completion rate was very low as they used IOU lists of 182 participating contractors (6% completion rate) and the list put together in the previous study of 9,516 HVAC contractor for interviewing non-participants (<1% completion rate, although they may not have dialed all contractors to get to their completed 15 interviews).
10. EMI. 2016. *Energy Upgrade California – Home Upgrade Program Process Evaluation 2014-2015*. CALMAC Study ID PGE0389.01 [http://www.calmac.org/publications/EUC Home Upgrade Process Evaluation Report Draft 2016.08.24 %28CLEAN%29.pdf](http://www.calmac.org/publications/EUC_Home_Upgrade_Process_Evaluation_Report_Draft_2016.08.24_%28CLEAN%29.pdf)
- EMI conducted 27 qualitative telephone interviews with participating and non-participating CA contractors using a sample drawn from the California Contractor Panel (a group of contractors recruited by Evergreen Economics to be available for research requests). Of the 27, 8 participating and 3 non-participating contractors were in PG&E service territory, but not specifically within the BayREN service area.
 - Ten participating contractors indicated that HU projects make up 11-50% of their revenue, one indicated it accounted for more than 75% of revenue and seven indicated 10% or less.
 - The study's contractors included a range of project volume from 1-10 projects/year to over 100/year, so includes different perspectives. 70% of these contractors used the Home Upgrade pathway over the Advanced pathway.
 - 25% of contractors experienced significant marketing and sales benefits as a result of their participation.
 - One high-volume specialist in the PG&E service territory indicated that switching from Advanced to Basic helped their business – they liked the point system.
 - The paperwork submission process went from an initial several days to a contractor being able to start work within a day by 2015, but contractors described time consuming paperwork with administrative burden and difficulty following the frequent program changes in paperwork requirements. Additionally, one contractor indicated that the number of forms was a problem. There were mixed messages though as another contractor indicated that using Vision to submit projects was simple, although suggested that requiring the SAID rather than the account number was a problem as customers had difficulty giving the correct number. Also, participating contractors reported minimal difficulties completing and submitting program paperwork and noted the positive recent changes.
 - Many HU participants were first contacted by a contractor (32%) and another 9% already knew their contractor.

- 72% of contractors followed up with participants after the install and 85% of participants felt the amount of post-installation communication was sufficient.
 - Participating contractors indicated a market differentiation due to being in the program, which the study authors thought could be improved upon through additional support such as a tiered contractor rating system or co-branding of materials. (See also IOU response to this rec in RTR summary.)
 - Participating contractors wanted more straightforward, less technical information they could provide to potential HU customers. Some felt that the SCE/SCG “Home Upgrade Digest” was a good document
 - Non-participating contractors included limited awareness of program requirements, difficulty making time for required trainings, and the perception that their customers are primarily motivated to minimize up-front equipment costs rather than long-term energy savings. Additionally, non-participating contractors generally had less favorable attitudes toward the benefits and importance of energy efficiency. Finally, most non-participating contractors also assumed that they needed to be able to conduct sophisticated whole home modeling in order to participate, indicating a lack of awareness of Home Upgrade pathway requirements.
 - The study authors recommended that the program provide contractor training on EE financing and other financing options for potential customers as, according to the study findings, more participants are turning to financing options to fund the capital costs of the whole home retrofit.
11. Grevatt, Jim, Hoffman, Ian, and Hoffmeyer, Dale. 2017. *Keys to the House: Unlocking Residential Savings with Program Models for Home Energy Upgrades*. <https://emp.lbl.gov/sites/default/files/keys-to-the-house-final-07052017.pdf>
- This effort performed a meta-analysis to provide useful design and implementation features, costs, and savings. They reviewed 134 evaluations from programs in 2010 to 2014 – programs included direct install, HVAC replacement and early retirement; and comprehensive whole-home retrofits.
 - Successful programs had six different conditions: 1.) Market potential for energy savings is sizable. 2.) The technology being promoted is reliable. 3.) The “right” participants are engaged (the ones for whom the opportunity is sufficient from the program’s perspective). 4.) The program works financially and “emotionally” for participants (meets their values in some way), and the process is not overly burdensome. 5.) The program is in the interests of contractors and vendors—it either aligns with their business models or, if it is disruptive, the rewards are sufficient to overcome that resistance. 6.) The savings are verifiable.
 - While the paper provided several ideas to help with a whole house program design, only one was specific to trade allies and stated: Aligning the program with contractor business needs by streamlining contractor time spent reporting to program and collecting payment. (The paper does not provide how to streamline contractor time.)
 - “Program administrators and contractors face widely recognized barriers to increasing the number of retrofits from these programs:
 - Audit-to-retrofit conversion rates are often low.
 - Whole-home upgrades can be expensive – exceeding \$15,000 in some territories.
 - Lags between energy assessment and installation are common. It can be tough to keep customers engaged from the initial lead to an energy assessment all the way to retrofit.
 - Installations are often not as comprehensive as the program administrator and contractors might like. Savings often are left on the table.
 - Transactions cost per unit savings are often higher than with other programs.
 - Accurate modeling of savings can be elusive but is critical.”

- Enhanced quality assurance *while contractor is onsite* to ensure no missed opportunities (e.g., complete, high quality duct and air sealing).
 - They also looked at ...
 - At what point do new or added program requirements become onerous for trade allies? And suggest that... A constantly changing program environment can undermine a contractor’s business model and create an impression of risk. Risk, real or perceived, can make it more costly for contractors to obtain capital to get equipped for energy efficiency work or for business expansion. Similarly, new program requirements can introduce new or higher labor costs that can frustrate profitability and, indirectly, discourage contractors from “selling” retrofits or measures promoted by programs.
12. Hartwell, Ray and Spring, Roger. 2010. Leveraging a Regional Trade Ally Network to Help Vendors and Customers Connect with Varied Utility Efficiency Programs across Multiple Closely-Packed Service Territories. ACEEE Summer Study. <http://evergreen-efficiency.com/wp-content/uploads/2017/03/ACEEE-Leveraging-a-Regional-Trade-Ally-Network.....pdf>
- Bonneville Power Administration (BPA) and the Northwest utilities used a regional Trade Ally Network (TAN) to “catalyze lighting efficiency without compromising the autonomy of individual utilities.” This document is relevant because of the multiple utilities and programs that the trade allies faced, which is like what the BayREN trade allies face.
 - The paper discusses their challenges of adapting a TAN to work with multiple utility programs in a small geographic area and concludes that TANs are a valuable tool, but that key differences in approach should be considered.
 - BPA hired a consultant to manage the TAN. The consultant was not a program operator, but they: 1) performed regional roadshow trainings, 2) maintained a website and newsletter for contractors, 3) provided live support to contractors, and 4) facilitated sessions with utility representatives around consistency of program efforts, training, leveraging incentives, and marketing efforts.
 - The authors considered the TAN approach a success. The network grew and add contractors in areas that had lacked capacity to add any contractors. They were so successful that they were discussing how to move from absolute number of contractors to “quality” contractors.
 - The lessons learned were that the TAN needed to 1) prioritize helping contractors connect with different utility programs instead of merely presenting a single program, and (2) highlight commonality across programs rather than dwelling on differences between programs.
13. ILLUME. 2016. Process Evaluation of Energy Trust of Oregon’s Existing Home Program. Energy Trust of Oregon.
- ETO made several changes to their program related to how they interact with trade allies. This study explored findings related to those changes. Changes were in five areas:
 - Account management model – A single point of contact who provides program guidance, mentorship and support for trade allies; Instant incentives – A process by which contractors deduct the incentive amount directly from a customer’s bill, carrying the cost of the incentive until receiving reimbursement from Energy Trust; Web forms – The option for trade allies and customers to submit incentive forms online; Trade ally portal – A web-based repository of information where trade allies can log in and view project details for all of the active and completed projects they have submitted for an incentive, as well as access program forms; Newsletter/blog – An information source called Insider that provides both general information to all trade allies, as well as specific information on program offerings, market-related topics, tips and education
 - Relevant findings related to these changes included:

- Consider further tailoring communications to reflect trade allies' unique businesses, level of program activity, star rating, geography, and/or target market. For example, consider reaching out to trade allies with lower star ratings and/or level of program activity and determining a) their individual interest in more focused support, and 2) their unique needs, such as marketing opportunities, and mentorship on outreach strategies based on geographic location.
- Conclusion – Although Energy Trust provides a variety of marketing tools to assist trade allies in selling efficient equipment through the program, trade allies are not consistently using or aware of the tools. Recommendation – Continue efforts to reach out individually with trade allies to raise awareness of the availability of marketing tools and information resources. Explore opportunities for expanded trade ally training and mentorship on the availability of tools such as cooperative marketing funds, the booklet of measure incentive information, and website development funds. While many trade allies take full advantage of the suite of offerings, others remain unaware of the tools, or do not utilize them.
- Conclusion – Most trade allies who qualified to offer instant incentives had used them to varying degrees, but the perceived benefit of them was mixed. The program introduced the instant incentive with the hope that it would act as a tool to help trade allies make the sale of an efficient model of equipment over a standard efficiency model. In addition, the instant incentive structure requires the trade ally to submit complete project forms to receive reimbursement. Energy Trust hoped that by putting the onus on the contractors to fill out the forms, rather than the customer, the program would receive more complete and accurate program data. Of the trade allies we interviewed, most trade allies who were qualified to offer instant incentives did. However, the preference to use this incentive method over the traditional customer application appeared to be dependent on trade ally personal preference, with no evidence of fundamental concerns or process issues.
- Conclusion – The shift in quality assurance procedures to include a desk review option appears to be achieving its intent of reducing the number of field inspections while maintaining project quality. In 2015, QA home visits decreased significantly over the course of the year, while pass rates for QA inspections remained stable. Most trade allies interviewed did not notice the change, and those who did notice did not think it impacted their projects.

14. Joint California IOUs. 2016. RTR Appendix: RTR for the Energy Upgrade California—Home Upgrade Program Process Evaluation 2014-2015. EMI Consulting, Calmac ID #PGE0389.01.

- The evaluation report found that contractors had difficulty operating across multiple utility territories because of the administrative differences across programs, and suggested consistency (where possible) and that contractors be educated about differences where it was not possible to be consistent. The IOUs responded that due to climate zone differences, regional differences, and single fuel utilities, the IOUs are not able to be consistent. They also rejected the recommendation because so few contractors work in multiple territories.
- The evaluation found that financing can make contractors more successful, that contractors were in need of additional marketing materials for customers and additional instruction on how to fill out project incentive forms, and that contractors often didn't understand the time commitments involved prior to participating. The evaluation made recommendations about these findings that the IOUs accepted. As a result of the evaluation recommendations:
 - The IOUs plan to train contractors on available financing (but they do not plan to train on income-qualified options).
 - The IOUs plan to streamline contractor marketing materials and supporting contractors more. The IOUs provide fact sheets on the contractor website and contractor portal.
 - The IOUs agreed to continue clearly communicate program time commitments to new contractors.
- The evaluation also made other recommendations that were rejected including:

- Recommendations that the program help participating contractors differentiate themselves from non-participants through a tiered system and co-branding. This recommendation was rejected. The IOUs list all contractors and their websites on customer facing websites.
15. Li aukus, C. 2012. *HVAC to Whole-House Performance Contractor*. Home Energy Magazine. <http://www.homeenergy.org/show/article/nav/homeperformance/id/1803>
- Of all the work activities in a WHPC business, there are 15 for which a transitioning HVAC contractor will find guidance especially valuable. These are:
 - technical training;
 - equipment requirements;
 - relationship to vendors;
 - strategic planning;
 - customer education;
 - community engagement;
 - arrival process;
 - conducting on-site customer interviews;
 - assessing whole-house performance;
 - customer package presentation;
 - assessment reporting;
 - state or local program reporting;
 - work scope and procedures;
 - job completion verification; and
 - relationship to subcontractors.
16. Opinion Dynamics. 2017. *Statewide Financing Pilot Marketing, Education, and Outreach Process Evaluation*. EMI Consulting, California Public Utilities Commission. Calmac ID #CCS0002.
- Contractors were not interested in video training. This type of training is also costly to the program. Contractors preferred simpler approaches such as a website, person to call, or handouts/fact sheets.
 - The study found that to understand financing, contractors need one-on-one support such as a person that they can call to discuss financing options. This led to the development of a concierge model per the contractors' request.
 - Notably, the study found that marketing prior to finalizing the details of the program was not an effective way to market. The program should be fully developed before marketing so that the marketing materials do not need to be re-worked multiple times.
 - Contractors prefer PACE to REEL financing because it has a simpler application and an easier qualification process. Notably, PACE was also attractive to contractors because PACE often compensates contractors for generating leads (\$250).
17. Opinion Dynamics and Advent Consulting Associates. 2016. *PY 2013-2014 California Statewide Workforce Education and Training Program*. California Public Utilities Commission.
- All IOUs require that contractors hold BPI Building Analyst certificates. There are, however, multiple trainings that we related to whole house or home performance programs similar to the Energy Upgrade Program. Only two of these training are explicitly required by the IOU EE programs.
 - As part of the EUP program operations, the IOUs have quality control checks in place to identify areas where contractors need more training. If the need for additional training is identified, the IOUs offer various types of training.
 - The primary gaps in contractor knowledge and skills included understanding the value of energy efficiency, how different systems work together, and how to communicate these concepts to customers. Additional commonly-cited gaps included understanding customer needs and being able to big, manage and supervise work.

- Expert panelists recommended encouraging, but not requiring, training.
18. PA Consulting Group. 2010. Home Performance with ENERGY STAR: Insulation Supply-side Study Results and Integration with Participant Findings. Focus on Energy Evaluation. State of Wisconsin Public Service Commission of Wisconsin.
- While this is an older study, it discussed two distinct paths: (1) the consultant path, which appears to be more like an auditor path with recommendations, and (2) the qualified contractor path, in which the contractor can install after identifying needs. The study found that free-ridership is higher among the qualified contractor path because customers are further along in their decision-making when they contact a contractor.
 - Participants that use qualified contractors claim relatively low program influence on their decision-making processes, while qualified contractors are more likely to report that the program impacts their recommended practices.
 - The analysis did not provide any evidence that the NTG ratio is higher with multiple measures; but it did indicate that households receiving air sealing might have been more influenced than other participants.
 - The study recommends that NTG use both supply-side and demand-side data collection to tell the full story.
 - WECC provided training to both paths.
19. Peters, Jane and McRae, Marjorie. Research into Action. 2009 ACEEE. Reaching Business and Industry: Lessons from 30 Years of Process Evaluation.
- The paper describes various difficulties seen over and over within process evaluations as well as some solutions. Specific difficulties and solutions noted are:
 - Program cycles can be difficult for market actors. Not informing trade allies about changes can make them reticent to participate in the future. It is helpful to hold meetings with the local contractor groups or electrical union to explain the program changes before they are implemented. Some programs contract with a firm that recruits trade allies into the program, trains them, and then keeps them informed as the program changes occur.
 - It can be difficult for some trade allies to participate. Training about program rules and procedures is helpful in improving this ability. Similarly, if the processes are too complicated, even for trade allies who are knowledgeable about the technical aspects of the products and services, the cost of retrieving that knowledge on a customer-by-customer basis to complete program forms is too much.
 - Paperwork is often cumbersome. Process evaluators have found when trade allies are able to receive the incentive payment directly, rather than the incentive going to the consumer, the trade allies tend to be more willing to complete the paperwork and meet other program requirements. There are risks in doing this, as some evaluators have also found, but inspections and quality assurance oversight can be used to manage the risk and improve the ability of the program to deliver savings.
 - Process evaluators have found repeatedly that programs founder when they specify procedures that don't work for the market actors. Examples are that the timelines are wrong; the money (total program budget) ebbs and flows, or runs out prior to the end of the year, necessitating a wait until January for additional funding; the incentive levels and eligible measures change without warning; incentivized equipment is not readily available in sufficient quantities; program requirements that necessitate additional (read "costly") visits to the customer site, such as for inspections or signatures at various stages of the process. Solutions for each of these is specific to the problem, but the overarching idea is to keep the program simple and consistent.

20. Rivera, Jennifer. DNV-GL. *Influencing Trade Ally Behavior*. 2015 AESP paper.
- Paper presents lessons learned from years of working with trade ally networks and the result of a nationwide survey about influential tactics.
 - Nice breakdown of what influences trade allies based on a survey with 350 respondents across the nation. No connection between whether fulfilling these wants creates higher performing programs, but still provides a good sense of what is desired.
 - The paper's top tactics that influence trade ally sales through a program: 1) increasing incentive levels; 2) performance bonuses; and 3) comprehensive program driven awareness campaign
21. Susser, Jonathan. 2017. *Key Ingredients for Successful Whole-House Residential Retrofit Programs*. Blog <https://www.advancedenergy.org/2017/06/10/key-ingredients-for-successful-whole-house-residential-retrofit-programs/#>
- The author performed a literature review of whole-house retrofit programs and three stood out. These three saved greater than 30% per house, had high participation rates, 96% approval rating and default rates under 1 percent. The four key attributes indicated for this success were:
 - Home Energy Use Characterization: appropriate house (high usage)
 - Streamlined Home Energy Assessments: right energy modeling program (validated savings)
 - High-Quality Installations: right contractor knowledge (high contractor competency for low complexity homes)
 - Availability of Capital: right cost to participate (low cost of entry)
 - These three programs went after high users (>30,000 kWh/year), included multiple measures (air sealing, duct sealing and HVAC were the most common measures), provided targeted technical training so that installation would be of high quality in low complexity homes, and used on-bill financing.
22. Warren Energy Engineering, Ecometric, Johnson Consulting Group. 2017a. *Home Performance with ENERGY STAR Programs: Benchmarking and Emerging Trends*. Delaware Sustainable Energy Utility.
- This literature review found that the most successful HPwES programs are those that link contractor outreach and program financing options.
 - This literature review also recommended developing a stronger contractor outreach strategy, and stronger contractor marketing tools.
 - This literature review mentioned that most Home Performance programs require BPI certification, but then cited an indirect 2013 source that mentioned that MassSAVE also gives customers the option of using an independent installation contractor that is not BPI certified.
 - This study also indicates that there is a shift to get more HVAC contractors participating in home upgrade programs because these contractors have long-term relationships with customers through their maintenance agreements. This strategy may lead to more comprehensive retrofits.
23. Warren Energy Engineering, Ecometric, Johnson Consulting Group. 2017b. *Program Evaluation & Program Re-Bid Recommendations*. Delaware Sustainable Energy Utility.
- The Assisted Home Performance with ENERGY STAR program has not been well-understood or well received by contractors.
 - Conversion rates varied significantly between the contractors, rather than by region. QA/QC also was not consistently enforced across all contractors.
 - Several contractors complained that the software for energy audits was difficult to use and time consuming. The report recommended that contractors receive additional training on correctly using program software and/or switching to a more user friendly version.

24. Whitehurst, Duane. Portland Energy Conservation, Inc. *The Trade Ally Approach to Growing the Green Workforce*. 2010 ACEEE Summer Study on Energy Efficiency in Buildings. <http://aceee.org/files/proceedings/2010/data/papers/2230.pdf>
- Paper discussing PECEI's approach to training contractors to work in the Energy Smart Grocer program. The program was in the Northwest and PECEI was the PA and used trained trade allies to implement the projects promoted to the grocers.
 - Useful paper to see a different approach to using a third party as contractor support.
 - Indicated that PECEI was the "connector" between utilities, grocers, suppliers, and trade allies.
 - PECEI have field energy analysts (FEAs) whose work is iterative and perform much of the up-front work and make the effort pretty hassle free for the customers. They connect with the grocers, perform audits, explain audit findings, as for permission to secure first phase bids (first phase measures require little to no grocer investment) and arrange trade ally bids, work with grocer to decide on course of action on bids, estimate utility funding for project, assist in scheduling work, perform on-site verification check of trade ally work, submit paperwork to ESP program for processing, and then work again with the grocer to encourage further measure implementation using the savings from the first phase measure installations.
 - Trade Allies were supported by three main activities with the last being described as the most successful for PECEI.
 - One-on-One Meetings: Tell - FEA talks with trade ally about specific project for specific grocer. Sharing information on EE measures and providing trade ally with supplier names if needed. Works OK according to the paper, but difficult to grow due to time constraints.
 - On-site Installation: Show - worked with suppliers and stores to provide actual installation training for several trade allies across four locations. Ended up with 24 trade allies (17 companies) for these events. Had difficulties due to taking more time than expected and stores were not happy about that. Suppliers liked exposing local trade allies to their products, but felt it was break even since they often travel to do complex installations at no cost. Also, the multiple events (eight) were more than was needed.
 - Trade Ally Breakfasts: Get to Know - PECEI organized a series of morning trade show style events with "real" breakfasts that brought together suppliers and trade allies, focusing on two specific retrofits (ECM and anti-sweat heater control). It took them a bit to get it off the ground, but the paper indicated that there was a 3-6 month lag between these events and completed projects. The data presented showed correlation between trade ally breakfasts and projects.
25. Zimring, M et. al. 2010. *NYSERDA's Home Performance with ENERGY STAR Program: Leveraging Contractors' Ability to Sell Home Upgrades*. Case study drawn from Driving Demand for Home Energy Improvements, Lawrence Berkeley National Lab.
- NYSERDA offers contractors discounts on BPI certification, subsidies for diagnostic equipment, listing on the website, access to consumer financing options and incentives, use of NYSERDA marketing materials, referrals/leads from NYSERDA campaigns, and co-op advertising reimbursements.
 - They focus their HPwES marketing money on building the program, not the NYSERDA brand (however, there is a big umbrella NYSERDA campaign too). They found that the two-tiered approach creates a general awareness, while also driving projects where contractor capacity exists. They found that over 20% of active HPwES contractors used the co-op marketing in 2010.
 - NYSERDA also offers contractors a one-day training in sales and marketing that teaches contractors skills on communicating the importance of HPwES and a whole-house approach. This focuses on helping contractors make a living.

26. U.S. Department of Energy. 2010. *Driving Demand, Working With and Learning From Contractors*. Text of webinar on the subject. <https://www.energy.gov/eere/wipo/driving-demand-working-and-learning-contractors-text-version>
- This is the text from a webinar supported by the DOE Technical Assistance program. The four panelists described their work with contractors as well as some of the things they learned in the programs they either manager or interact with. (No slides included). Panelists included the Director of EE and Affordability programs at NYSERDA, a staffer from AFC First Financial Corporation, a Senior VP at GreenHomes America, and the President of Recurve (a firm performing energy audits and green energy retrofits that was sold to Tendril in 2012)
 - The NYSERDA discussion overlaps with the information in the Zimring 2015 entry of this bibliography.
 - NYSERDA’s programs are thought of as market transformation programs. They want to grow both the demand in the marketplace and the ability of contractors to meet that demand.
 - They subsidize contractor advertisements and special promotions. They co-brand it. NYSERDA runs a broad multi-media advertising campaign as well.
 - They reimburse contractors (for advertisements, etc) based on the number of retrofits completed.
 - They have roundtable discussions, especially around marketing and provide assistance to their contractors (including training on how to sell HPwES)
 - NYSERDA runs a QAQC program that contractors use as a selling point.
 - The financial person indicated that the contractor has to be engaged and if a financing process is too complex, the contractor will just suggest that the customer use their credit card.
 - He indicated that the contractor network must be financially and ethically stable and that someone has to monitor the network when financing is included. Also that successful programs recruit and train contractors to use the financing to increase close rates.
 - The GreenHomes person indicated that they direct a consumer to a website with contractor approved links to help the contractor build their sales.
 - He described program stability is key, program complexity as a big problem that will scare contractors away, and to not ask for the same data in multiple forms.
 - Listening to the contractors was extremely important.
 - He described the need for proactive engagement with contractors (something like a business development person) to get out and get contractors to use the program.
 - The Recurve person did not add much new, so nothing included here.
27. U.S. Department of Energy. 2017. Better Building Residential Network Peer Exchange Call Series: *0 to 60: Best Practices for Accelerating Program Performance*. <https://www.energy.gov/eere/better-buildings-residential-network/downloads/0-60-best-practices-accelerating-program>
- This slide deck (73 slides) describes reducing the administrative burden and cost of programs by improving processes to manage and track upgrades; review work quality; and streamline data collection, management & transfer.
 - Information in this deck is not specific to trade allies, but provides several program related possibilities for program improvements that touch on paperwork (the issue often described by trade allies as a problem).
 - NYSERDA provides a case study where, within 60 days, they made changes to their website and printed materials that reduced paperwork requirements and simplified applications (among other benefits). Although the specific improvements were not shown, they bulleted out the process they used during the 60 days.

- EmPower NY used a different process (called LEAN) to improve paperwork quality rate from 69% to 93%.
- APS described how contractors left their HPwES program after becoming frustrated with inspection failures. To overcome this, they used an NREL product to help show high quality work and consistently trained all contractors on the product. APS also provided contractors with quarterly scorecards and ranked contractors in their performance. APS had 35-40 active contractors with 44% conversion rate and all contractors between 8.83 and 9.96 (out of 10) in terms of quality.

28. 2018. *Home Performance with Energy Star Program*.

https://www.energystar.gov/index.cfm?c=home_improvement.hpwes_sponsors_about

- We include this in our annotated bibliography to describe a program similar to Home Upgrade.
- “Home Performance with ENERGY STAR offers whole-house solutions to high energy bills and homes with comfort problems. The program is managed by a local sponsor that recruits home improvement contractors who are qualified to perform comprehensive home assessments. The assessment includes the heating and cooling systems, windows, insulation, flow of air into and out of the house, as well as a safety check of gas appliances. Based on this assessment, participating contractors offer solutions to fix comfort problems and address high energy bills.” (copied from website, see above link)
- HPwES has a network of over 40 local programs and 1,500 home improvement contractors

29. 2018. *Better Buildings Residential Program Solution Center*. <https://rpsec.energy.gov/>

- We include this in our bibliography as it is a source of information on programs like HPwES
- U.S. Department of Energy, Energy Efficiency & Renewable Energy maintains a site with step-by-step guidance, tips, and resources to start a program or make program changes.
- Better Buildings maintains a residential network that connects EE programs and partners to share best practices and learn from one another to increase the number of homes that are energy efficient. This website has information on the network.
- Build it Green is a Better Buildings Accelerator Partner

30. 2017. *ACEEE How to Talk about Home Energy Upgrades*

<http://aceee.org/sites/default/files/publications/researchreports/b1701.pdf>

- This document is specific to helping frame messages during home energy assessments to encourage home upgrades. Information is based on a literature review, expert interviews and a survey-based randomized control trial that tested message framing strategies with a nationally representative sample of US homes.
- While bill savings and upfront costs are primary drivers of EE upgrade decisions, focusing on comfort and health by using terms such as “get rid of cold drafts”, “remove mold”, “reduce allergy symptoms”, or “insulate against noise” may motivate customers more than talking about savings.
- Market segmentation analysis can help determine the best message for different types of people, but that is good for regular marketing, not trade ally approaches.
- From our read of this paper, a contractor may be able to support some of these messages if they have marketing materials to help them.

MEMORANDUM

To: Kellen Dammann, Marin County, Shraddha, BayREN

From: Mary Sutter and Jenn Mitchell-Jackson

Date: 02/20/19

Re: Contractor Feedback Memo



This memo is the third of three memos provided to BayREN regarding contractors. The first memo (8/3/18) described BayREN’s active contractors and the second memo (9/11/18) provided population level statistics on contractors within the BayREN territory as well as information gleaned from a literature review (we also provided BayREN with an annotated bibliography on 8/22/18).

This memo covers information from a survey of 25 of 95 participating contractors (26% response rate)¹ and in-depth interviews from nine contractors who either dropped out of participating (four prior participants) or attended an introductory training but chose to go no further (five near participants). Specifically, the memo describes four areas as shown in the table below.

Area	Research Questions	Key Finding
Value to Contractors	What aspects of working with BayREN do contractors most value? What are positive aspects of the program for contractors?	<i>Contractors value the incentives offered by the program more than any other aspect of the program. Having their name listed on BayREN’s website was also highly valued. Many of the surveyed contractors see a strong value proposition for participating, although jobs through the program can be a small part of their business. They feel that the marketing performed by BayREN and the customer incentives helps them to sell jobs to customers. Additionally, for some, these jobs are noted to be “more intensive” and ones that increase “the ticket amount”, so provide a positive bump to the contractors bottom-line.</i>
New Program Components	How interested are contractors in participating in potential new program designs and what are desired components?	<i>About half of the contractors are interested in program components that support and align with helping sell jobs (leave-behind materials, marketing support, or energy-related information on past customers for potential future projects). Similarly, about half of contractors are also interested in an online portal they can use to track their projects.</i>
Contractor Challenges	What are challenges (negative aspects) of the program for contractors?	<i>The program adversely affects some firms’ bottom line (although apparently not sufficiently to drop out of the program). Paperwork is time consuming and averages close to three hours per project, although there appears to be a learning curve as firms with more projects describe a little less than two hours. Additionally, changing and complex rules have a steep learning curve.</i>
Training Content and Logistics	What type of training is desired and what are the best modes, times, and months for training?	<i>While less than half of contractors are directly interested in training, those that are want a variety of training content revolving around selling energy efficiency. Most are interested in having content delivered online and on-demand. They prefer shorter trainings (up to 2 hours) and, if provided in person, meetings that take place in the morning (from 8 AM to 10 AM with breakfast). February and March are the two months when most contractors (~70%) feel they have time for a training.</i>

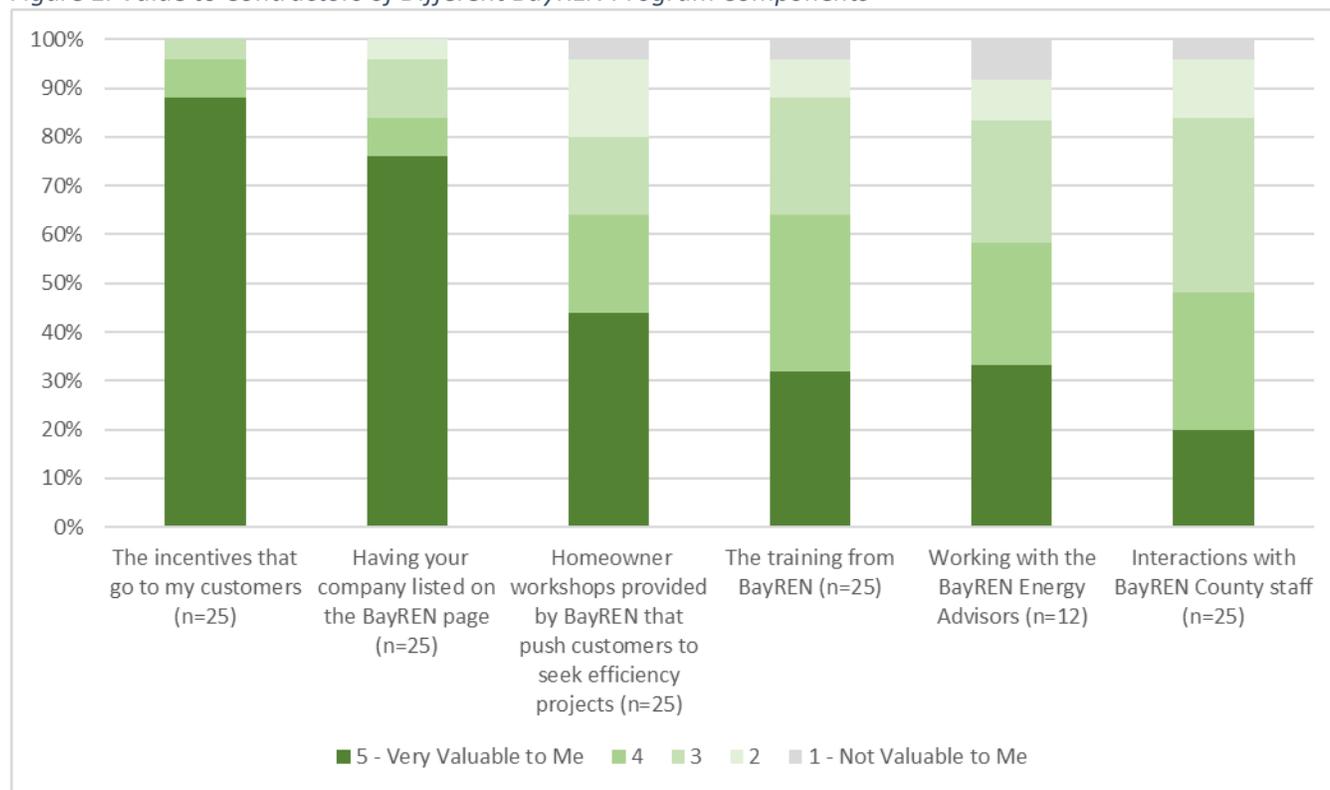
The memo has three attachments: 1) short description of how the survey and interviews were fielded and completion rate for the survey, 2) survey questions, and 3) interview guide.

¹ A note on the percentages used in the memo – typically when we have less than 30 respondents, data is presented as numbers, not percentages. However, because of the good response rate, we show most of the information as percentages with the number of respondents shown in the graphic.

Value to Contractors

The contractors indicated the most valued aspect of working with BayREN are the incentives provided to customers as “Incentives help close deals” and “are positive selling points”. Additionally, one contractor indicated that incentives help them sell higher efficiency HVAC equipment, which increases their bottom line. Many of the contractors (76%) find value in having their names listed on the BayREN website. One specifically indicated they get a “fair number” of referrals from BayREN and find this easy to access list “very helpful”. Over half of the contractors (60%) found value in the training (i.e., rated it a 4 or a 5) and smaller companies tended to see higher value as six of the eight contractors who found the training most valuable (a 5 on the scale) were companies who have completed ten or less program projects. While only about half work with an Energy Advisors, when they do, about half see value in those interactions (in the figure below we limited the responses around Energy Advisor value only to those 12 who had interacted with the Advisor). Additionally, slightly less than half (44%) felt that homeowner workshops are valuable because they help push customers to seek efficiency projects. (See Figure 1)

Figure 1. Value to Contractors of Different BayREN Program Components



The contractors interacting with BayREN Energy Advisors saw value (as shown in the figure above) and found them helpful. Most found them extremely or very helpful (83%) and none expressed feeling that the Advisors were either “slightly helpful” or “not helpful at all”.

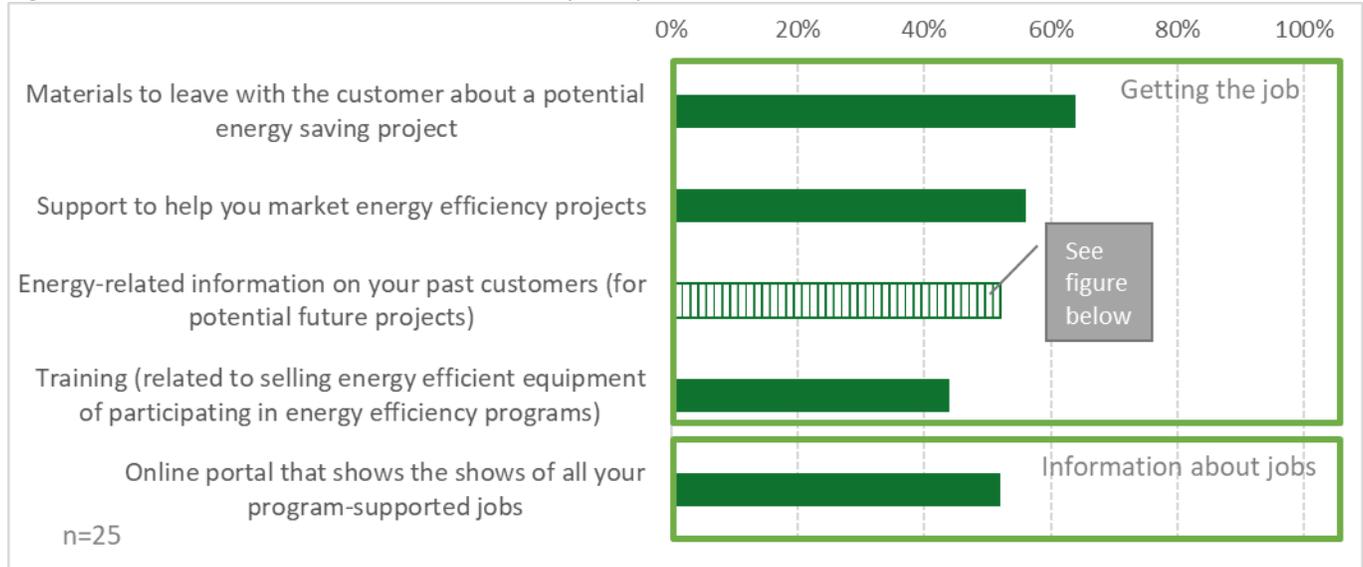
While not directly asked, a few respondents provided indications that they value BayREN specifically, noting that BayREN is “very helpful in working with difficulties to get projects completed”, “the process seems pretty easy and can be done online”, or there is “never an issue with payment”. Others found CLEAResult very helpful and are looking forward to 2019 as the program is moving away from Home Upgrade projects.

However, while they see value in the program, one contractor indicated that program jobs were only about 4% of their business and a past participant described performing “thousands” of jobs outside of the program (although we cannot say if these jobs would have met the program requirements).

Interest in New Program Components

Contractors are more interested in new components that can help them get a job than training or a portal that shows them information about their jobs. BayREN contractors (64%) were most likely to want materials to leave with customers and about half (56%) want some sort of marketing support. Less than half desire training on how to sell EE equipment. (Figure 2)

Figure 2. Items Contractors would like to see BayREN provide in the Future (n=25)



Additionally, of the contractors (13) who were interested in “energy related information on past customers for potential future projects” (shown in the hatched third bar above), about half indicated they were “very likely” to follow up with customers to try to sell them additional energy equipment, with another 15% indicating they would be “somewhat likely.” (Figure 3)

Figure 3. Likelihood of reviewing and following up to sell customer additional energy efficiency equipment if provided quarterly information by BayREN about previous customer using more or less energy (n=13)

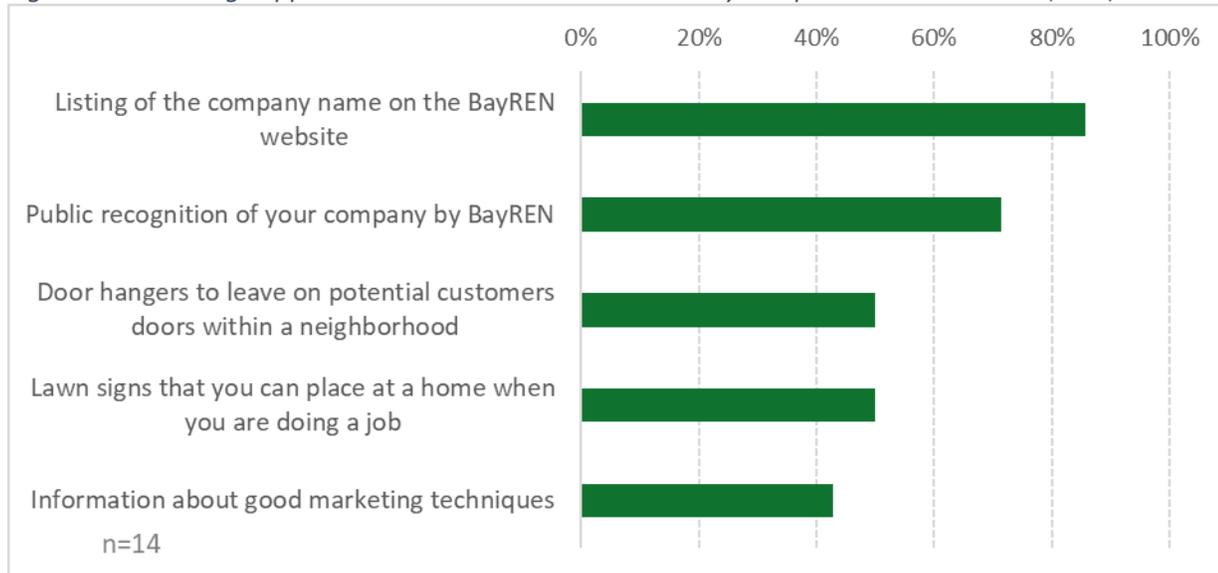


Contractors want their customers to know that energy efficiency is legitimate. As such, contractors are interested in third-party documentation that they can share with their customers. One specifically wanted “PDF materials to email to a customer about a potential energy saving project, with descriptions of what makes it different than a standard lower priced contractor” and another suggested “a database of articles about efficiency to which a

contractor could point their customers”. While not suggested directly by the contractors, this information could also be disseminated via videos on the BayREN website.²

Of the 14 (out of 25) contractors who described specific marketing support they desired, most wanted their company listed on the BayREN website and public recognition of their company. Fewer were interested in either lawn signs to place at a home where they are doing a job or want door hangers to leave on potential customer doors within a neighborhood. (Figure 4).

Figure 4. Marketing Support Contractors would like to see BayREN provide in the Future (n=14)



Additionally, one expressed interest in co-marketing support for mailers and another desired marketing materials that “explain the importance of building performance & zero net energy retrofits”.

The survey took some of the concepts found in the literature review (e.g., contractor spiff, actively working with contractors, etc.) as well as ideas from BayREN implementers and directly asked contractors which options BayREN could provide that may make the contractor more likely to sell projects. Of the several options BayREN could provide, some had a higher likelihood of bringing in more sales, as shown in Table 1.

The top characteristic perceived to be most effective at increasing sales was a single person to call for questions. This was reiterated in open ended comments with one contractor wanting to be able to call one person to verify that a home qualifies, one indicating that they had difficulty figuring out who to call with specific questions, and another describing the service he received from BayREN was phenomenal when he called but seemed to get different people who all did something different.

Table 1. Percent of Contractors “Very Likely” or “Somewhat Likely” to sell More Projects (n=25)

Specific Area	“Very Likely” to sell more projects	“Somewhat Likely” to sell more projects
A single person at BayREN available for them to call if they have any questions	60%	20%
BayREN directly rewards them via a cash bonus	56%	20%
If BayREN reserved incentive funding for the contractor	40%	12%
A quarterly newsletter on program offerings, market-related topics and education	32%	44%
If the contractor was compared to other known firms	28%	28%
If the contractor was compared to other anonymous firms	4%	44%

² According to the program implementer, BayREN will be adding case studies and customer testimonials to the BayREN single family website. (<https://www.bayrenresidential.org>)

Specific Area	“Very Likely” to sell more projects	“Somewhat Likely” to sell more projects
An annual appreciation lunch for those meeting a specific number of jobs	8%	4%

Contractor Challenges

The previous memo described contractor challenges based on a literature review. The main challenges in the literature were the paperwork and program requirement issues. The BayREN contractor survey supported those findings, with paperwork being one of the most mentioned negatives.³

The responding contractors spent an average of 2.7 hours per job on paperwork. However, this average varied considerably, with one contractor indicating an average of about 45 minutes while another indicated 8 hours per job. The data indicate a learning curve on how best to do paperwork as 11 companies (with about 50 jobs and over) average 1.8 hours per job and the remaining 14 companies (with under 20 jobs) average 3.4 hours per job.⁴ Additionally, one contractor indicated that the “rebate applications process [is] confusing unless you do at least 10 a year – it does get easier.” (See Figure 5)

Figure 5. Average Paperwork for Each Contractor -- Hours per Job



As found in the literature review, our research indicated that some of the program requirements (learning complex rules and keeping up changing program requirements) are viewed as challenging for the contractor. One contractor mentioned that “some of the HVAC requirements are hard to achieve, specifically the AC SEER and EER matching and the duct leakage requirement of 5% or less. If all ducts are not accessible, the duct leakage goals are hard to hit if not opening the walls or floors.”⁵ Two of the four near participants we talked with previously had

³ One contractor suggested going paperless, perhaps making customer responsible for uploading all needed receipts to a website as well as enabling the website to upload pictures if needed.

⁴ As shown in the figure, the learning curve may not be absolute for all contractors as one company with over a hundred jobs estimated they spend about five hours per job on paperwork, which does not show improvement for their time as they performed more jobs.

⁵ According to the program implementer, the duct leakage requirement is based on approved workpapers. Opening walls or floors may allow the contractor to access duct work, but at an additional cost to the customer who may be unwilling to bear that cost.

difficulties with specific program requirements (e.g., worker comp requirements) that we were told have since been resolved.

Paperwork was not the only challenge described by BayREN contractors. Other difficulties described were around profitability (bottom line, cash flow), perceived reduction in customer trust due to inability to ensure rebate levels, or issues with the customer hearing different information.

- **Bottom line affected:** While some contractors mentioned the potential for increasing the number of jobs or the “ticket amount” there were several others who indicated that the program adversely affected their companies bottom line, with one stating they make “less money on BayREN jobs” due to time it takes for the company to participate. The time is not just for paperwork, but time spent summarizing the program details to customers (even when customer decide not to follow through with a job). Another described their company covering the customer rebate cost (or half the cost) if a leakage test doesn’t pass.
- **Cash flow issues:** One described a slowing of their sales process and cash flow and needing to raise their prices to cover the additional operating expenses incurred by program participation. One past participating contractor indicated that having no payments from BayREN until everything is signed off was very difficult for them and the program adding that the contractor would be not paid until the project was signed off on the permit was the deal breaker.⁶
- **Perceived reduction in customer trust:** While at least two participating contractors described “we didn’t have any issues with customers receiving their incentives” and “never an issue with payment”, one past participating contractor described a lack of their ability to ensure that customers were provided the rebates promised to them by their firm which was very frustrating for the firm and created angry customers. This inability to ensure the customer rebate as promised by the firm was one of the main reasons this firm chose to stop participating.
- **Customers hearing different information:** At times it can be difficult for the contractor when they are not on the same page as the Energy Advisor. One contractor indicated that he had encountered confused clients when suggestions or rebates from the Energy Advisor were not aligned with the contractor’s suggestions. Several other contractors mentioned that they could not meet customer expectations that had been established by the Energy Advisors. For example, one described that the house could have issues that impede their ability to reach the air sealing or duct sealing goals mentioned by the Energy Advisors. (Note that these goals are predetermined based on approved CPUC workpapers.)

Additionally, the amount of time required by the program can be frustrating to customers and contractors. One contractor indicated that customers can sometimes become annoyed at the multiple visits required for items such as inspection and testing. Another contractor said that “You need to offer real quality, not just words. You have to have your installers on board or meeting the requirements will be more difficult.” A high-quality installation appears to be positive for a customer but may cause a contractor to change their normal processes and take additional time (or visits) to a job site.

Contractors also mentioned that if customers are told by an Energy Advisor that they do not need initial testing, the contractor cannot establish a baseline for building leakage or know if there are combustion safety issues that need to immediately be addressed. (Note that performing a Combustion Appliance Safety test prior to sealing the house was mandatory within the program.)

⁶ According to the program implementer, the CPUC set this permit sign off requirement.

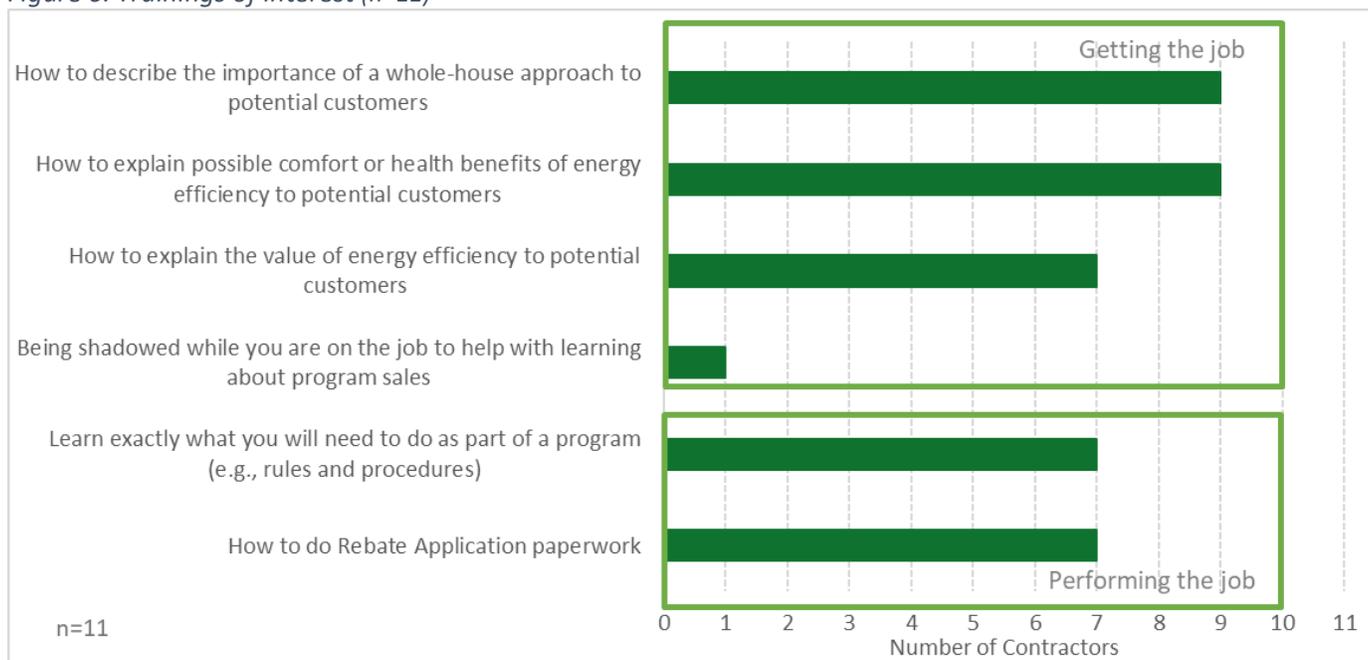
Training – Content and Logistics from Participating Contractors

Training Content

Like the marketing information above, contractors want training to get a job over training on how to perform the job. While many contractors viewed training as moderately valuable⁷, less than half (44%) desired training content related to selling EE equipment. Of those 44% (11 contractors), almost all want to have a good way to explain EE benefits to prospective customers, how to bring in other non-energy benefits (e.g., health, comfort) during a sales conversation, or a tactic for helping customers understand and want to embrace the whole house approach.

Slightly fewer contractors wanted training on how to fill out the rebate application or on what is required to participate. However, at least one past participant could not determine how to participate (e.g., how to fit the BayREN program processes into their current processes) and stated this was why they left the program. Virtually no contractors want to be shadowed on the job. (See Figure 6)

Figure 6. Trainings of Interest (n=11)



Three contractors desired “something else” from trainings: one desired peer round tables (to explain what has been working and what hasn’t in marketing, sales, and installs), one wanted equipment specific training (i.e., heat pumps, refrigerant charging, etc.), and another wanted information on the level of savings found by past participants and detailed information (with examples) on energy benefits across different pricing tiers. One contractor suggested training that was specific to field staff, sales staff, office staff, or management.⁸ This suggestion could have the benefit of focusing training, which could also reduce training times for each group.

Training Logistics

Mode: Most contractors want online and on-demand trainings (90% ranked this first or second across the three different training modalities)⁹, followed by webinars at specific times, with in-person trainings ranked last by most contractors. One contractor who was in favor of on-line trainings brought up that requiring contractors to drive to meetings does not help with reducing greenhouse gases. It may be possible for BayREN to provide mixed-mode trainings – that is, some are available on-demand while others must be taken in-person. (On-demand training can be very focused, and contractors can go back and revisit as often as they want if they did not fully understand or it could be a video of the in-person training with the ability to easily find specific areas of the training.)

⁷ 64% ranked training as a 4 or a 5 on a 5-point scale where a 5 was “very valuable”.

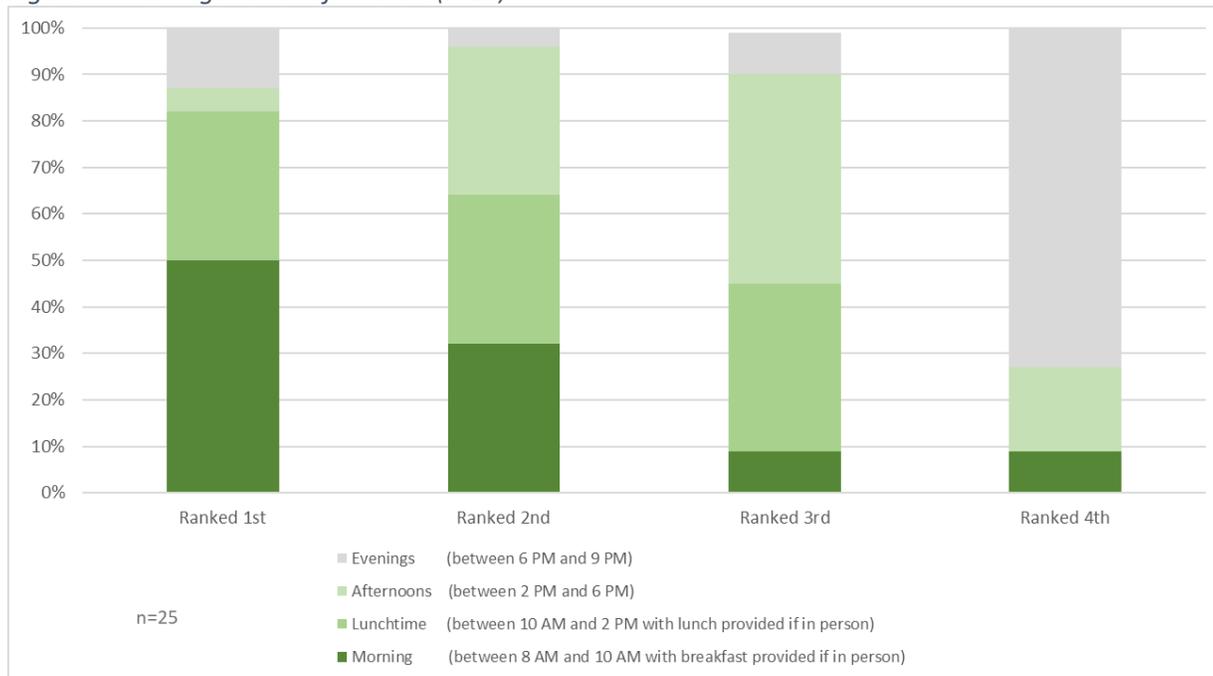
⁸ According to the program implementer, specific one-on-one training is currently being provided to participating contractors

⁹ This is different from what we found in the literature review where video-based training was not desired.

Length: There is a mix of preferred length of time for trainings. The survey specified that contractors would need 4 hours of training and gave four options on how those hours could be broken out. Slightly more than half of respondents preferred multiple trainings (i.e., to reach the 4 hours, a contractor would need to attend more than one meeting) while a single training of 4-8 hours in length was ranked last by most.

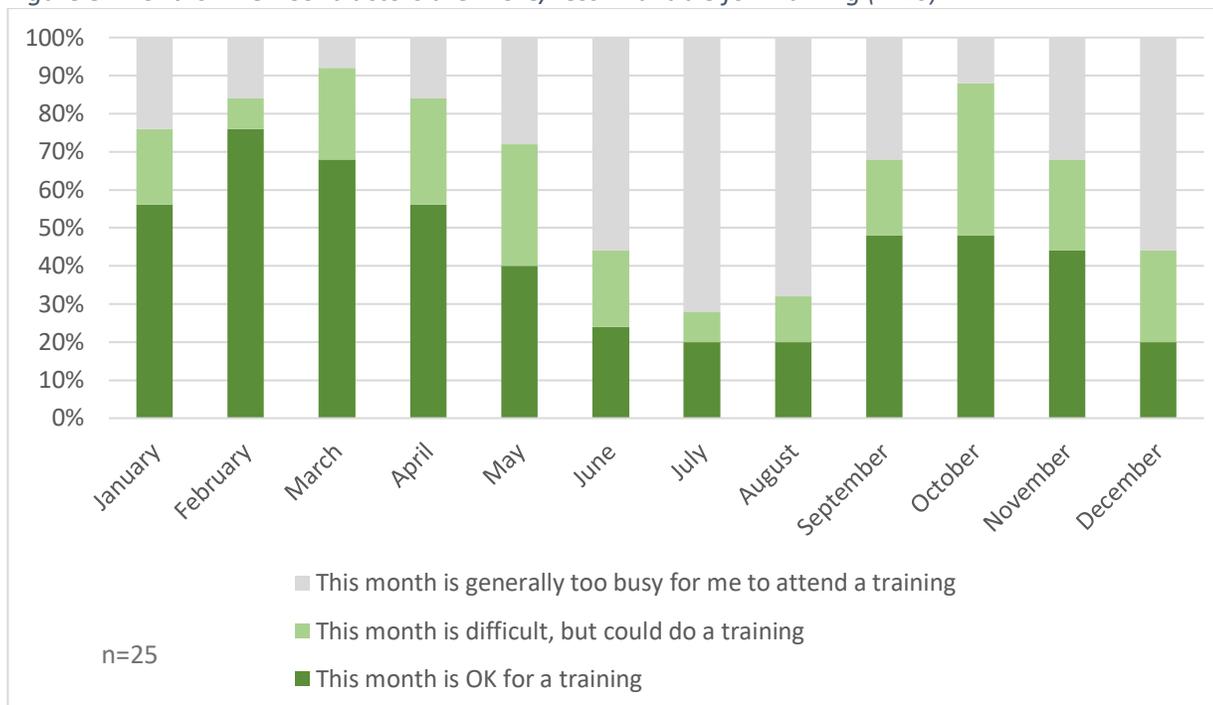
Time of Day: If in-person trainings were required, contractors prefer morning meetings, followed by lunchtime meetings. Evening times are least preferred (Figure 7).

Figure 7. Trainings Times of Interest (n=25)



Time of Year: For contractors, some months are busier than others. Those are months when training would be less manageable for them. The first four months of the year are best, while summer months are poor. (Figure 8)

Figure 8. Months when Contractors are More/Less Available for Training (n=25)



Training comments from Previous Contractors or Contractors with Training, but no participation

The training was viewed as too intense for a couple of the contractors who did not participate despite being trained. Having two 8-hour days' worth of information was a bit of a "crash course" and difficult for them to absorb, resulting in a lack of knowing how to move forward once back at work. One described the training as "trying to learn to build a house in two days" and suggested splitting the training into 4-hour pieces (in line with the timing results we found in the online survey respondents) and having these training be a week apart to allow the trainee to process the information and come back with questions about real-world application. Additionally, having a mixed-mode training as suggested above could help this type of contractor.

The training content "wants" from these contractors varied. Specifically, contractors wanted to learn how to:

- make money from program participation
- integrate the BayREN processes into their current processes
- test house pressure, address leaks and operate the relevant equipment
- present information in relatable, customer terms

One contractor suggested that the training include a case study for companies unfamiliar with EE program participation. For this type of firm (i.e., having never participated in EE programs), the addition of a single point of contact (as described to be of high interest for most participating contractors) may be helpful.

The three attachments (in the next sections) provide the survey response rate information and the survey questions as well as the interview guide.

Attachment 1: Survey and Interviews Fielded; Response Rates

On-line Survey

Grounded Research opened the online survey for responses on 12/10/18 and closed the survey on 1/10/2019. (See the next attachment for the survey questions.)

Contact emails were for the population of participating contractors as of the middle of 2018 and received from BayREN. Of the original 111 contractors, 95 had completed at least one project and were the target of the survey.

BayREN marketed the upcoming survey in the BayREN Participating Newsletter (Vol. 2, Issue 13 – December 7th, 2018), describing when the survey will be available and showing that those who complete the survey would receive a \$25 Amazon Gift card. Invitations to complete the survey were sent on December 10, 2018 and reminder emails were sent on 1/12/18 and again on 1/21/18. Additionally, BayREN county staff reached out to a few contractors directly via phone to request participation.

Table 2 shows the final disposition and response rate. The 25 contractors who completed the survey received a \$25 Amazon eGift card.

Table 2. Online Survey Disposition and Response Rate

Description	Number of Contractors
Participating Population as of June 2018	111
Number with at least one completed project (sent survey invite)	95
<i>Bounced email addresses</i>	-8
<i>New email addresses</i>	6
<i>Bounded new email addresses</i>	-3
<i>Added different email address for existing company</i>	1
<i>Surveys begun, but not completed</i>	4
Completed Surveys	25
Response Rate (AAPOR Rate 1*)	26%

**The American Association for Public Opinion Research. 2015. Standard Definitions: Final Dispositions of Case Codes and Outcome Rates for Surveys. 8th edition. AAPOR*

The 25 completed surveys represent 24 unique companies as we added a different email for an existing company and both people ended up completing the survey. We checked to see if the responses were different and felt that they represented different viewpoints and so kept both.

The survey was relatively representative by county, but, of the two possible contractors in Marin or Napa, neither responded to the survey. (see Table 3).

Table 3. County of Population and Survey Respondents

County	Population		Survey	
	N (95)	%	n (24)	%
Alameda	21	22%	4	17%
Santa Clara	21	22%	6	25%
Contra Costa	17	18%	5	21%
Solano	9	9%	3	13%
Sonoma	8	8%	2	8%
San Mateo	3	3%	2	8%
Marin	1	1%	0	0%
San Francisco	3	3%	1	4%
Napa	1	1%	0	0%
Other	11	12%	1	4%

The online survey had more contractors with 6-20 projects than the population and fewer contractors with 21-50 program projects. However, those with the fewest and the largest were represented fairly well within the online survey. (See Table 4)

Table 4. Number of Projects for Population and Survey Respondents

	Population (N=95)	Survey (n=24)
1-5 projects	24%	17%
6-20 projects	27%	42%
21-50 projects	16%	4%
>50 projects	33%	38%

Most of the respondents have been working with the program for many years, but there were more long-time participants who responded to the survey than found in the population. (see Table 5)

Table 5. When Contractors began Participating - Population and Survey Respondents

Year Began	Population (N=95)	Survey (n=24)
2013	23%	46%
2014	41%	29%
2015	18%	17%
2016	9%	4%
2017	5%	0%
2018	3%	4%

Interviews

Between January 14, 2019 and January 30, 2019, Grounded Research reached out to both near participants (contractors who had taken training but did not move on to participate) and past participants (contractors who had participated but dropped out) for a short phone interview (the draft guides are provided in Attachment 3) Names for each group were provided by the BayREN program implementer.

For past participants, we chose to reach out to contractor firms that had not been included in the online survey. We emailed contractors and followed up with phone calls.

We completed nine interviews – 5 with near participants and 4 with past participants and each was provided a \$25 Amazon gift card.

BayREN Contractor Survey

Q1 Thank you in advance for answering our survey!

We are collecting information to help BayREN improve their energy efficiency programs in the future and most of our questions are generic to determine your level of interest in possible program changes. As a contractor who has participated in BayREN's programs in the past, your feedback is highly desired.

This survey should take you about 5 minutes. If needed, you can stop and return at any point.



(The icon above designates that the order of the following responses is randomized so each participant sees a different order of options. This helps to ensure validity of choices.)

Q2 Please mark which of these you would like to see BayREN provide in the future to participating contractors. (choose as many as you are interested in)

Materials to leave with the customer about a potential energy saving project (1)

Support to help you market energy efficiency projects (2)

Training (related to selling energy efficient equipment of participating in energy efficiency programs) (3)

Online portal that shows the shows of all your program-supported jobs (4)

Energy-related information on your past customers (for potential future projects) (5)

None of these (7) [The icon with the circle and X designates that this choice does not show up when being asked to rank choices]

Something else (please specify) (6) _____

Display This Question:

If Q2 != None of these

Carry Forward Selected Choices - Entered Text from "Q2"



Q3 Please rank these choices by clicking on the choice and moving it up or down to show highest (#1 on top of the list) to lowest importance.

- Materials to leave with the customer about a potential energy saving project (1)
- Support to help you market energy efficiency projects (2)
- Training (related to selling energy efficient equipment of participating in energy efficiency programs) (3)
- Online portal that shows the shows of all your program-supported jobs (4)
- Energy-related information on your past customers (for potential future projects) (5)
- None of these (6)
- Something else (please specify) (7)

Display This Question:

If Q2 = Support to help you market energy efficiency projects



Q4 What specific type of marketing support would you want? (choose as many as you are interested in)

- Lawn signs that you can place at a home when you are doing a job (1)
- Listing of the company name on the BayREN website (2)
- Door hangers to leave on potential customers doors within a neighborhood (3)
- Public recognition of your company by BayREN (4)
- Information about good marketing techniques (5)
- None of these (6)
- Something else (please specify) (7) _____

Display This Question:

If Q2 = Training (related to selling energy efficient equipment of participating in energy efficiency programs)



Q5 What specific training are of interest to you? (choose as many as you are interested in)

- How to explain the value of energy efficiency to potential customers (24)
- How to explain possible comfort or health benefits of energy efficiency to potential customers (25)
- How to describe the importance of a whole-house approach to potential customers (26)
- How to do Rebate Application paperwork (27)
- Learn exactly what you will need to do as part of a program (e.g., rules and procedures) (28)
- Being shadowed while you are on the job to help with learning about program sales (29)
- None of these (30)
- Something else (please specify) (31) _____

Q6 Participating in Energy Efficiency programs generally requires some sort of training, both at the beginning and often throughout the year. The next set of questions asks you about training specifics. Please assume that you will need to fit in a **minimum of 4 hours of training** in a calendar year. There may be other optional training available that would be beyond the 4 hours.



Q7 What is your preferred training mode? Please move the options from to high (#1, top of the list) to low.

- _____ In Person (1)
- _____ Internet Webinar that you watch at times specified by the program where you can ask questions of the webinar presenter (2)
- _____ Online On-Demand that you can watch at any time (3)



Q8 What is your preferred length of time for training? Please move the options from high (#1, top of the list) to low.

- _____ Up to an hour (multiple trainings required to reach 4 hour minimum) (1)
- _____ From 1 to 2 hours (multiple trainings required) (2)
- _____ From 2 to 4 hours (3)
- _____ From 4 to 8 hours (for other optional training) (4)



Q9 What is your preferred time of day for training? Please move the options from high (#1, top of the list) to low.

- _____ Morning (between 8 AM and 10 AM with breakfast provided if in person) (1)
- _____ Lunchtime (between 10 AM and 2 PM with lunch provided if in person) (2)
- _____ Afternoons (between 2 PM and 6 PM) (3)
- _____ Evenings (between 6 PM and 9 PM) (4)

Q10 Certain months can be more or less difficult for you to find time for training. Please choose your level of difficulty for each month.

	This month is OK for a training (1)	This month is difficult, but could do a training (2)	This month is generally too busy for me to attend a training (3)
January (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
February (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
March (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
April (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
May (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
June (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
July (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
August (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
September (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
October (10)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
November (11)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
December (12)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q11 If BayREN provided you with information that showed whether previous customers were using more or less energy consumption on a quarterly basis, how likely are you to review this information and follow up with those customers to try to sell them additional energy efficient equipment (equipment of any type)?

- Very Unlikely (1)
- Somewhat Unlikely (2)
- Somewhat Likely (3)
- Very Likely (4)
- I don't know (5)

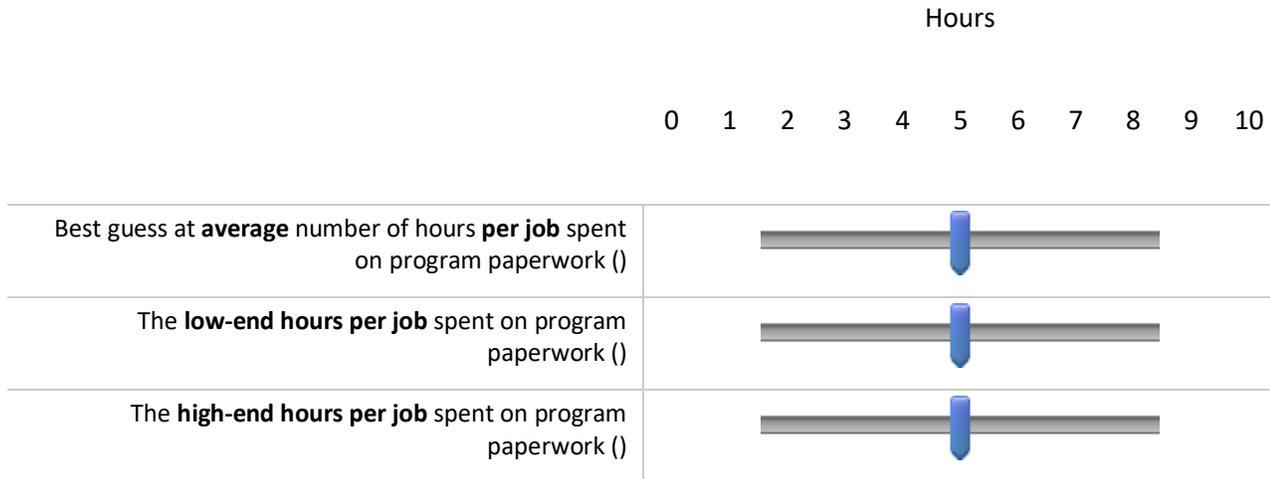


Q12 BayREN could make design changes in the future in their efficiency programs. How likely are you to **sell more projects per year through a BayREN program** if....

	Very Unlikely (1)	Somewhat Unlikely (2)	Somewhat Likely (3)	Very Likely (4)	I don't know (5)
...you received cash performance bonuses from BayREN (1)	<input type="radio"/>				
...you saw where your company was compared to other contractors and all company names are shown (2)	<input type="radio"/>				
...you saw where your company was compared to other contractors and other company names are anonymous (3)	<input type="radio"/>				
...BayREN reserved incentive funding for your company if you consistently bring in a specific number of jobs to the program (4)	<input type="radio"/>				
...BayREN provided an annual appreciation luncheon that your company can attend if you bring in a specific number of jobs to the program (5)	<input type="radio"/>				
...BayREN designated a single person to call if you have any questions (6)	<input type="radio"/>				
...BayREN provided a quarterly newsletter on program offerings, market-related topics and education (7)	<input type="radio"/>				

Q14 Now think back to your participation in the Home Upgrade Program (HUP). Our records show that your company has completed $\{e://Field/N_Projects\}$ projects since you began to participate (and through June 2018).

For each of those projects, we know that your company spent time on the BayREN Home Upgrade Program required paperwork and we are trying to quantify the total hours. Please move the slider for each row. *[In the actual online survey, the slider bar below was set at zero as the starting point in all cases.]*



Q15 As a contractor working with BayREN how much do you value each of these items?

	1 - Not Valuable to Me (1)	2 (2)	3 (3)	4 (4)	5 - Very Valuable to Me (5)
The incentives that go to my customers (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The training from BayREN (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Homeowner workshops provided by BayREN that push customers to seek efficiency projects (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Having your company listed on the BayREN page (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Interactions with BayREN County staff (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Working with the BayREN Energy Advisors (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q16 Do you interact with the BayREN Energy Advisors?

Yes (1)

No (2)

Display This Question:

If Q16 = Yes

Q17 How helpful are those interactions?

Extremely helpful (1)

Very helpful (2)

Somewhat helpful (3)

Slightly helpful (4)

Not helpful at all (5)

Q18 What are two **positive** things about participating in the BayREN programs that you would tell a contractor who does not participate in the program?

Q19 What are two **negative** things about participating in the BayREN programs that you would tell a contractor who does not participate in the program?

Q20 What other comments do you have about the program or BayREN that you would like us to share with BayREN? (Note that your comments will be anonymous)

Attachment 3: In-depth Interview Guide

Thank you for agreeing to talk with us. We expect that our discussion will be less than 10 minutes. We will explore reasons you chose to <drop out / not participate> and will ask your opinion on a few program design changes that BayREN is considering.

Explore why dropped out (prior participants only)

1. What were the main difficulties you experienced that caused you to drop out of the program?
2. We know that your company spent time on the BayREN required paperwork and we are trying to quantify the total hours.
 - a. What is your best guess at the average number of BayREN HUP per job spent on paperwork?

 - b. What was the low-end hours per job spent on program paperwork? _____
 - c. What was the high-end hours per job spent on program paperwork? _____
2. How much did the time you had to spend on program paperwork affect your decision to drop out?

Explore reasons for not participating (near participants only)

6. Why did you attend the initial meeting? - What was of interest?
7. Why did you choose not to participate in BayREN programs after you attended an initial meeting?
8. What would need to be changed for you to choose to participate?

Explore level of interest in new program design (both prior and near participants)

9. BayREN is considering several new program options. Do you think you would start participating <again> if the following were now part of the program?

	<i>We still would not participate</i>	<i>We might participate</i>	<i>We definitely would participate</i>
...you received cash performance bonuses from BayREN (a)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...you saw where your company was compared to other contractors and all company names are shown (b)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...you saw where your company was compared to other contractors and other company names are anonymous (c)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...BayREN reserved incentive funding for your company if you consistently bring in a specific number of jobs to the program (d)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...BayREN provided an annual appreciation luncheon that your company can attend if you bring in a specific number of jobs to the program (e)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...BayREN designated a single person to call if you have any questions (f)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...BayREN provided a quarterly newsletter on program offerings, market-related topics and education (g)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

[Probe for level of importance of each and combination of things]

10. Is there anything else you would like to let us know about?

Those are all our questions. Thank you for your time!