Report by **SBW CONSULTING, INC.**

PROCESS EVALUATION FOR PG&E'S ENERGY UPGRADE CALIFORNIA™ MULTIFAMILY PILOT PROGRAM

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EXECUTIVE SUMMARY

Introduction

Pacific Gas & Electric's (PG&E)'s Energy Upgrade California™ Multifamily Pilot Program, launched in February 2013, offers assessment incentives to multifamily property owners for having energy assessments completed at their properties and upgrade incentives for making whole-building energy efficiency upgrades. The objective was to test a comprehensive building approach to improving the energy efficiency of existing multifamily properties. The pilot intended to test this design with both affordable housing and market-rate properties. Seven properties received upgrades from the pilot and all completed construction in November and December 2013.

Research Objective

The goal of any pilot is to test an approach and determine what works and what might need modification. In this light, this study was conducted in tandem with the pilot's implementation to assess all of the pilot's key aspects; to understand what worked well, what did not work well, and what could be improved. This evaluation report and its recommendations will be used by the PG&E program team to define what should be changed or revised in the program – prior to expanding the program.

Research Methodology

The evaluation team set out to conduct in-depth interviews with all participating stakeholders in the pilot over the course of three months; between December 2013 and February 2014. In total, we conducted 46 in-depth interviews with PG&E staff, program implementation staff, participating and non-participating property owners, participating and non-participating raters, and participating contractors. We also conducted an extensive review of program tracking data and project files including EnergyPro modeling reports, property assessment reports, QA/QC reports and verification reports. Finally, we conducted a limited literature review that included thirteen different reports and websites related to energy efficiency programs serving the multifamily market.

Key Research Findings

The pilot finished with seven fully[1] participating properties and 513 units, surpassing the pilot goal of 500 units. All seven were affordable housing[2] properties. Another seven participants completed assessments (two were market-rate[3] properties) during the pilot period without completing upgrades, although several of these might complete retrofits starting in 2014. The pilot produced an estimated 668,536 annual kWh ex ante savings for an average of 1,303 kWh saved per each of the 513 units. It also produced an estimated 24,687 annual therms ex ante savings for an average of 48 therms saved per each of the 513 units. Total assessment and upgrade incentives amounted to $527,470, indicating $1,028 in incentives spent per unit and $0.79 spent per first-year ex ante kWh savings. Based on a

1 Full participation is defined as having energy assessments conducted and retrofits completed.

2 Our use of the term "affordable housing" is aligned with and can be defined by the program's definition of income-qualified properties: "properties with deed-restrictions for low-income residents or properties with 80% or more tenants receiving Section-8 vouchers." (Source: Draft Participant Handbook_v4, March 26, 2013, Build it Green, p. 2). These properties are generally owned or managed by non-profit organizations.

3 By "market-rate" we mean all other properties that are not income-qualified, affordable housing (see footnote above). These properties are generally owned by for-profit owners.

limited data to date[4], the incentives covered 40% of the construction costs, while various funding sources (e.g., bank loans, existing capital, tax-exempt bonds etc.) covered the remaining 60%.

In general, all participating parties, including raters, contractors and property owners, were highly satisfied with the program. Properties owners, specifically, were completely satisfied with the quality of the work and all would consider participating in the program again. All parties involved expected some problems given that it was a pilot but the benefits of participating seemed to outweigh them. All parties were interested in program opportunities in the future. Based on the literature review, the program design and implementation aligns with many of the best practices known to date in serving the CA multifamily retrofit sector.

The program design and implementation elements that went well during the pilot period include:

- Program Implementer's Technical and Administrative Assistance
- Assessment Incentive Option for Raters
- Multiple Tenant Benefits
- The PG&E Single Point of Contact (SPOC) for All Multifamily Programs
- A Multi-Stage Screening Process
- Leveraging Raters' Existing Networks to Recruit Properties Worked Well for Gaining Affordable Housing Participation
- Good Program Design Fit for Affordable Housing Properties
- Allowing for Property Owners to Continue Existing Relationships with Raters and Contractors

One goal of implementing a pilot is to try an approach and then gain knowledge to help refine both the program design and implementation in the future. This assessment found several key issues in the pilot including:

- Gaining Market-Rate's Full Participation in Pilot Period
- Communication amongst Multiple Parties During Pilot Retrofit Projects
- Expectations Around Combustion Appliance Safety Protocols
- Program Paperwork and Applications
- Tenant Disruption
- Contractor Participation Requirements

Ex ante energy saving estimates are determined by comparing a model of energy use under baseline conditions and to a model of use that assumes the installation of recommended energy upgrades. Duct-blaster tests are conducted when ductwork improvements are recommended and the impact of these improvements is incorporated into the savings estimates. At this time, the program does not account for

4 Only two projects had costs just for the EUC energy upgrades. All other projects only had total construction costs and we couldn't determine what percentage of the total construction cost was for the energy upgrades.

infiltration savings[5]. Reductions in infiltration rate will generally reduce energy use for heating, so the program may be underestimating savings by excluding this factor. This is a common challenge for multifamily programs and the program may look to Puget Sound Energy for some ideas on how to address this. Further, Title 24 is not used as the baseline for savings even though some of the affordable housing properties were undergoing retrofits at the time to meet Title 24 standards. The pilot team should discuss whether Title 24 should be used as the baseline for savings in EnergyPro modeling, especially for affordable housing.

We analyzed the program tracking records to determine whether savings could be verified through a billing analysis. The first step was to see if the project documentation provided the information needed to conduct a billing analysis. The second step was to review the pilot participant characteristics to determine whether billing analysis is possible to verify savings. Key findings related to program documentation and potential billing analyses include:

- After some revisions and clarifications from the implementer, the program and measure information needed to conduct a billing analysis was present. Initially, information conflicted across documentation when comparing Econ reports (energy modeling information), verification reports and QA/QC reports. This was largely because the implementation team did not have time to thoroughly review documents and update conflicting information. However, through conversations with the implementer, the evaluation team was able to determine the measures installed, including the type of measures, quantity and location. (See Appendix A for the measures installed by project).
- Master versus individual meters may limit the potential for billing analysis on some properties depending on what is master metered (e.g. water heating).
- A comprehensive mapping of meters to units or to buildings did not take place during the pilot largely because this would slow down the implementation process and make for a very complicated and cumbersome participation process.
- It is currently unknown how well PG&E can match usage information to the property addresses in pilot records.
- Only 2-3 months of post-retrofit data is available at this time. Billing analysis typically requires 12 months of post-retrofit data to account for savings across multiple seasons. If savings is analyzed at this time it would mainly capture heating savings, which may only apply to some properties where heating is individually metered. An early analysis of savings would be best after the summer months.

In addition, we note that the coordination with the Multifamily Energy Upgrade California (EUC-MF) program and the Energy Savings Assistance (ESA) program is vital to future implementation. During the pilot period, none of the projects were participating in both at the same time. In fact, all of the projects had participated in ESA in prior years. Therefore, the layering of ESA and the EUC-MF program has not been tested yet but needs to be considered in any future design and implementation strategy.

Recommendations

5 A common challenge in multifamily programs. Puget Sound Energy is the only similar program that is known to measure infiltration savings in their models.

While some of the findings in this report apply to program processes for either type of participant, to really understand whether this design and implementation approach is effective for market-rate facilities, PG&E will need to run a second stage of the pilot that specifically targets market-rate buildings.

To help build towards a full-scale program with market-rate buildings, we recommend:

- Provide the same assessment incentives for market-rate and affordable housing
- Offer a green rating label that already has market recognition through participation in this program or assists building owners in obtaining other established ratings such as LEED
- Develop a marketing and outreach strategy that engages market-rate buildings when they are doing major renovations
- Offer on-bill financing as soon as possible

To streamline program processes, we recommend the following:

- Improve communication amongst project teams by assigning a project lead and assembling kick-off meetings
- Improve communication around CAS procedures and review the protocols
- Automate the screening process
- Revisit contractor requirements
- Develop protocols for communicating ESA participation to raters

To help ensure that savings can be verified, we recommend the following:

- Add variables to the QA/QC forms to allow for the variation that occurs in the field (such as when measures are not completely installed and the quality of the installation)
- Create standardized methods and processes to eliminate missing and conflicting data across project documentation
- Perform a test match of addresses to meter numbers and bill history data
- Update project information in program database to reflect the final measures with specific dates of installation.

Organization of this Report

The table below shows the sections of this report and the content contained in each.

Section	Content
1. Introduction	Program description, study research objectives, methods and limitations
2. Pilot Accomplishments	Summary of participation in the pilot, including project information and ex ante savings
3. Overall Conclusions and Recommendations	Summary of overall conclusions and recommendations based on all evaluation methods
4. Summary of Interview Findings	Summary of the findings from each of the participant and non-participant interviews
5. Billing Analysis Feasibility and Data Needs	Analysis of whether billing analysis can be done and what data is present or needed to conduct one
6. Summary of Literature on Multifamily Market Best Practices	Summary of key takeaways from literature review on best practices in multifamily programs
7. Select Program Comparisons	Comparison of pilot design to NYSERDA and SMUD's programs
Appendix A: Project Descriptions	Summary of each pilot project including what is known/not known based on program records for verifying energy savings
Appendices B & C: CAS Issues	CAS issues identified at test-in and test-out
Appendices D & E: Incentive Detail	Incentive detail for NYSERDA and PG&E Pilot
Appendices F - J: Interview data tables	Detailed data tabulations for each question asked in each interview

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1. INTRODUCTION

1.1. EUC Multifamily Pilot Program Description

Pacific Gas & Electric (PG&E)'s Energy Upgrade California Multifamily Pilot Program (EUC-MF) offers assessment incentives to multifamily property owners for having energy assessments completed at their properties and then offers upgrade incentives for making whole-building energy efficiency upgrades.

In December 2011, PG&E submitted the program design to the CPUC who approved the program in October 2012. After a few months of preparation, PG&E and its implementer Build It Green (BIG) officially launched the program on February 1, 2013. The pilot period was scheduled to end in December 2013, but was extended to January 15, 2014 to allow for corrected document and application submissions.

Multifamily property owners in PG&E service territory have several energy-efficiency retrofit options and even more in the Bay Area (Table 1 below). PG&E assigned a staff member to serve as the Single Point of Contact (SPOC) for multifamily customers interested in energy upgrades. The SPOC explains the program options available to these customers and helps guide them toward the most appropriate fit for their property.

Table 1. Multifamily Programs in PG&E Service Territory

Program Name	Availability	Offerings	Eligibility
EUC Multifamily Whole-Building Pilot	All PG&E territory	Assessment rebates are based on size of building and whether affordable housing or market-rate; Upgrade rebates range from $600 to $1,500 per unit depending on level of savings, 10 – 40+%	■ 5 or more units per building ■ Must be a PG&E gas and electricity customer ■ Must use program-approved raters and contractors
BayREN EUC Bay Area Multifamily Building Enhancements (BAMBE)	SF Bay Area only	Free energy consultations and rebates for installations of multiple measures	■ 5 or more units per building
(Multifamily Energy Efficiency Rebate (MFEER)	All PG&E territory	Rebates for the installation of individual measures	■ 2 or more units per building ■ Must be in PG&E service territory
Energy Savings Assistance (ESA)	All PG&E territory	Direct installation of free in-unit and weatherization measures	■ Must be low income renters or homeowners; ■ Must use program contractors
Middle-Income Direct Install (MIDI)	Some PG&E territories outside of the Bay Area	Direct installation of free in-unit and common-area measures	■ Must be middle-income renters or homeowners; ■ Must use program contractors in eligible counties
Energy Watch Programs	Several San Francisco Bay Area counties	Variable, but may include common area, lighting and other measures	■ 5 or more units per building or commercially metered common areas ■ Must be a PG&E gas and electricity customer ■ Must use program-approved raters and contractors
Marin Clean Energy (MCE) Multifamily Energy Efficiency Program	MCE service territory (Marin County & City of Richmond)	Free walk-through assessment and technical assistance; customized offerings including in-unit, direct install lighting measures, and variable incentives for comprehensive, whole-building measures	■ 5 or more units per building or commercially metered com ■ Must be a MCE customer

Source: Interviews with PG&E Program Staff and "Matrix of Multifamily Energy Efficiency Programs in the Bay Area" chart

Energy raters trained and qualified by the pilot are central to the design. Participating raters perform comprehensive, whole-building, ASHRAE Level 2 assessments and then work with the property owner to develop a scope-of-work that improves a building's energy efficiency by at least 10% compared to baseline conditions as modeled in EnergyPro software.[6] Raters consult with the owners and contractors to prioritize measures that have the greatest economic, energy-savings, and incentive-earning advantage for the project. Raters also oversee program-qualifying contractors who install the energy efficiency upgrades, checking 100% of the work once it is complete.[7] Raters also test for and oversee the remediation of any combustion appliance safety (CAS) issues.

Once the assessment is complete, property owners receive assessment incentives typically ranging from $2,500 to $10,000 (see Table 19 for more detail on assessment incentive levels). If property owners complete recommended retrofits, they are eligible for tiered incentives ranging from $600 (for 10% savings) to $1,500 (for 40% savings) per unit based on the post-upgrade modeled savings (see Appendix Table 20 for more detail). Raters submit the required paperwork including the assessment report in order to qualify the building for incentives. Raters collect baseline measures and unit characteristics and then model savings in EnergyPro based on the recommended measures for each unit. This determines whether projects meet the 10% minimum savings requirement. Notably, any measures that can be modeled in EnergyPro qualify for incentives. Test-out procedures verify installation and include duct-blaster tests (infiltration tests are not conducted)[8]. The savings model from the assessment report is updated to reflect installed measures and findings from the test-out procedures.

As stated in the advice letter[9], the main formal pilot objective was to "transform the multifamily retrofit market from a prescriptive, one-size-fits-all approach, toward a comprehensive building analysis approach." The advice letter also states the following expected pilot program outcomes, including:

1. Per building energy savings of 10-20%;
2. A broader suite of measures than a typical deemed program;
3. Improved property owner[10] understanding of whole-building approach benefit;
4. More comprehensive maintenance follow-up for tenants and building by enrolling them into the California Integrated Customer Energy Audit Tool (CA-ICEAT), which enables ongoing comparative energy usage, and energy goal setting, thereby ensuring the persistence of savings after the EUC intervention is complete. Notably, this Audit Tool was not implemented during the pilot.

6 Two modules of the EnergyPro software are used depending on building characteristics. For low-rise buildings, the Residential Performance Module is used. For high-rise buildings, the Non-Residential Performance Module is used.

7 If any combustion appliance safety (CAS) issues are found during the assessment, raters ensure they are resolved by the time the retrofits are completed.

8 The test-in includes collecting building data to support an ASHRAE Level 2 assessment and an EnergyPro model. The model uses the existing building configuration and equipment to determine a baseline energy use model. Recommended measures are input into an energy model and the difference is the energy savings. During test out, the rater confirms measure installation and adjusts the proposed energy model as necessary to create a final energy model from which energy savings and incentives are calculated.

9 ADVICE NO. 3268-G/3972-E (Pacific Gas & Electric Company 0 U 39 M), December 22, 2011

10 Although the program targets property owners and managers for participation, for reporting purposes, we use the term "property owner" to cover both in this report.

5. A better understanding of combustion safety.

Build-It-Green (referred to throughout this report as implementation, administrative and/or technical assistance staff) and PG&E program staff identified several other pilot objectives including:

- Testing the potential participant screening model;
- Testing the program design model to ensure it worked across PG&E service territory, encompassing different climates, different building configurations, etc.;
- Testing the appeal of the program incentives across a variety of property types, e.g., affordable housing and market-rate; and
- Testing the integration of programs, e.g. properties moving from the Energy Savings Assistance (ESA) program to the EUC Whole-Building Pilot.

1.2. Study Research Objectives

PG&E hired this evaluation team to assess all key aspects of the pilot program, largely focusing on procedural elements (paperwork, requirements and communication), the layering of the ESA program and the EUC pilot, split incentive issues, return-on-investment, tenant disruption, market barriers and whether the energy savings can be verified. As such, this evaluation explored three main research objectives:

1. What worked well?
2. What did not work well?
3. What could be improved?

This evaluation report and its recommendations will be used by the PG&E program team to define what should be changed or revised in the program – prior to full expansion.

1.3. Research Methods and Data Sources

The evaluation team set out to conduct in-depth interviews with all participating stakeholders in the pilot over the course of three months; between December 2013 and February 2014. In total, we conducted 46 in-depth interviews to support this evaluation.

We interviewed all key program staff, all participating raters and all participating property owners and were able to get five of the seven installation contractors to engage in an interview (one did not have adequate contact information and the other could not make time for the interview despite multiple attempts and an incentive offering).

We interviewed twelve of the raters who attended the California Multifamily Existing Building (CAMFEB) training but did not enroll. We also interviewed 7 total market-rate non-participating property owners (six who expressed interest in the pilot but did not participate and 1 with a large property who has discussed the program with PG&E and manages 550 multifamily market-rate properties). The total non-participant property owner pool consisted of 22 property owners (7 market-rate and 15 affordable housing). We attempted interviews with all 7 market-rate property owners but were only able to

complete 3 interviews (of the remaining 4; 2 never answered the phone, 1 refused and 1 did not qualify for the study because he was not a property owner or manager).

Table 2. Interview Summary

Type	Number of Interviews	% of Population
NYSERDA and SMUD Program Staff	2	100%
PG&E and BIG Program Staff	9	100%
Participating Raters (unique firms)	5	100%
Participating Property Owners	7	100%
Participating Contractors	5	5/7 or 71%
Non-Participating Property Owners/Managers	6	6/21 Or 27%
Non-Participating Raters	12	12/45 or 27%
Total	**46**	**n/a**

The evaluation team also conducted an extensive review of program tracking data and project files including EnergyPro modeling reports, property assessment reports, QA/QC reports and verification reports. Finally, we conducted a limited literature review that included thirteen different reports and websites related to energy efficiency programs in the multifamily market.

Table 3. Secondary Data Sources

Apartment Hunters: Programs Searching for Energy Savings in Multifamily Buildings (ACEEE; 12/2013)
Scaling up Multifamily energy Efficiency Programs: A Metropolitan Area Assessment (ACEEE; 3/2013)
Engaging as Partners in Energy Efficiency: Multifamily Housing and Utilities (ACEEE & CNTenergy; 1/2012)
Impact and Process Evaluation of 2011 (PY4) Ameren Illinois Company Residential Multifamily Program (Opinion Dynamics, 11/2012)
"Multifamily Programs: Realizing Savings from an Underserved Market" (ECOVA, w/John Forde of Puget Sound Energy, 11/2012)
Multifamily Air Sealing Program" (Puget Sound Energy, 3/2013)
NYSERDA website: www.nyserda.ny.gov/Energy-Efficiency-and-Renewable-Programs/Multifamily-Performance-Program.aspx
Database of State Incentives for Renewables & Efficiency (DSIRE) website: www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=NY36F
SMUD website: https://www.smud.org/en/residential/save-energy/rebates-incentives-financing/multifamily-housing.htm
Home Performance Program Final Report (SMUD; 4/30/2013)
Lessons Learned through Piloting Energy Upgrade California™ (HMG-TRC, July 2013)
2010-2012 PG&E and SCE Multifamily Energy Efficiency Rebate Program (MFEER) Process Evaluation and Market Characterization Study (Cadmus Group, April 2013)
*ESA Program Multifamily Segment Study Volume 1: Report (*Cadmus Group and Research Into Action, December 2013)

1.4. Study Limitations

This study was limited in findings related to the market-rate multifamily sector given that the pilot only recruited affordable housing properties to conduct projects within the pilot period. As such, market-rate sector findings in this study rely on secondary research, the interviewees' perspective on the market-rate sector and 3 non-participating market-rate property owners (notably, one of these non-participating market-rate property owners represents 20% of the market)[11].

11 The property owner manages 550 multifamily market-rate properties in PG&E territory and there are an estimated 25,000+ of these properties in PG&E territory according to The ESA Program Multifamily Segment Study Volume 1: Report (Cadmus Group and Research Into Action, December 2013).

2. PILOT ACCOMPLISHMENTS

The pilot finished with 7 fully[12] participating properties and 513 units, surpassing the pilot goal of 500 units. All seven were affordable housing properties. Another seven participants completed assessments (two were market-rate properties) during the pilot period without completing upgrades, although several of these might complete retrofits starting in 2014.

Although no market-rate projects completed retrofits through the program, the pilot did meet its objective of serving different property types and geographic regions. The pilot successfully enrolled the 7 fully participating properties from across a variety of climate zones, including zones 2, 3, 4, 12 and 13 which range from the Bay Area to the Central Valley. Additionally, the pilot included properties with a variety of configurations (i.e., those with tens of units and those with hundreds across hi-rise, low rise and garden style buildings). The pilot also included different vintages: one property was built in 1946; another was built in 1993, and the rest were built in the 1970s.

Ten rater companies enrolled in the pilot and five of them worked on a fully participating project. Program records tracked another 45 raters who attended a program-sponsored California Multifamily Existing Building (CAMFEB) training. Fourteen installation contractors enrolled in the pilot and seven of them worked on a fully participating project.

As shown in Table 4 the program produced an estimated 668,536 annual kWh ex ante savings for an average of 1,303 kWh saved per each of the 513 units. It also produced an estimated 24,687 annual therms ex ante savings for an average of 48 therms saved per each of the 513 units. Total assessment and upgrade incentives amounted to $527,470, indicating $1,028 in incentives spent per unit and $0.79 spent per first-year kWh ex ante savings.

Table 4 also shows a current limitation of the program. Specifically, measure cost data are not tracked and were only available for two of the seven projects. Tracking project cost data is a challenging task because the energy upgrade work was often completed as part of much larger retrofit project; therefore, property owners often receive the total project cost instead of an itemized cost breakdown. The implementer, Build-It-Green, is aware of this issue and is looking for a solution.

12 Full participation is defined as having energy assessments conducted and retrofits completed.

Table 4. Pilot Program Participation Summary (ex ante)

Project ID	Units	Annual kWh Savings (ex ante)	Annual Therm Savings (ex ante)	Percent Improvement (ex ante per site)	Total Property Owner Incentives (Assessment and Upgrade)	EUC Upgrade Costs Covered by Incentives
Fremont	100	204,451	-31	22%	$89,200	Only total project cost available
San Leandro	216	247,961	4,989	22%	$206,720	Only total project cost available
Richmond	64	62,866	3,557	27%	$77,200	Only approximate total project cost available
Rohnert Park	32	35,967	4,741	27%	$43,600	Only total project cost available
Stockton	20	33,077	7,102	40%	$35,000	Only total project cost available
Oakland	17	9,003	944	17%	$17,750	29%
Fresno	64	75,211	3,385	17%	$58,000	52%
Completed	**513**	**668,536**	**24,687**		**$527,470**	
Average per unit		**1303**	**48**	**25%**	**$1,028**	**40.5%**

The table below summarizes the measures installed by the pilot; windows, refrigerators and domestic hot water heaters were the most commonly installed upgrades.

Table 5. Summary of Energy Efficiency Upgrades Completed

Energy Upgrades Selected	% of Participating Projects	No. of Projects
Windows	86%	6
Refrigerator	57%	4
Gas Hot Water Heater	43%	3
Low-flow showerheads	29%	2
Lighting	29%	2
Duct improvements	29%	2
Floor Insulation	29%	2
Wall Insulation	14%	1
Heat Pumps	14%	1
Dishwasher	14%	1
Cool roof	14%	1
Split A/C/Furnace	14%	1
Electric Hot Water Heater	14%	1
Furnace	14%	1
Attic Insulation	14%	1

3. OVERALL CONCLUSIONS AND RECOMMENDATIONS

This section describes the overall conclusions and recommendations derived from this evaluation.

3.1. What worked well in the pilot?

In general, all participating parties, including raters, installation contractors and property owners, were highly satisfied with the program. Properties owners specifically were completely satisfied with the quality of the work and all would consider participating in the program again. All parties expected some problems given that it was a pilot but the benefits of participating seemed to outweigh them. All parties were interested in program opportunities in the future. Based on the literature review, the program design and implementation aligns with many of the best practices known to date in serving the California multifamily retrofit sector.

The program design and implementation elements that went well during the pilot period include:

- Program implementer's technical and administrative assistance
- Assessment incentive option for raters
- Multiple tenant benefits
- The PG&E Single Point of Contact (SPOC) for all multifamily programs
- A multi-stage screening process
- Leveraging raters' existing networks to recruit properties worked well for gaining affordable housing participation
- Good program design fit for affordable housing properties
- Allowing for property owners to continue existing relationships with raters and contractors

This section below describes each of these successful elements in more detail.

Program Implementer's Technical and Administrative Assistance

All participating parties including Raters, Contractors and Property Owners mentioned implementation staff's technical and administrative support as critical to project success. Property owners cited their technical and administrative assistance as a main program benefit. Three participating owners praised the implementation staff describing them as "phenomenal" and "fabulous". Professionalism satisfaction ratings are high with an average score of 8.3 (range 7-10 on a scale from 0 to 10). Program information satisfaction was rated 7.7 (range 4-10 on a scale from 0 to 10). Owners mentioned contracts/agreements (3), PowerPoint presentations with implementation staff (2), program brochure (1), webinar (1), email (1), and conference calls (1).

Participating raters praised the technical and administrative assistance provided by the program implementer. All participating raters (5) described one or more positive aspects to working with implementation staff including that they:

- Offered practical flexibility in EE retrofit design approach (2)

- Were extraordinarily technically supportive (2)
- Worked within construction timelines (2)
- Were extraordinarily administratively supportive (1)
- Were amenable (1)
- Communicated well (1)

Nearly all participating contractors (4 of 5) found implementation staff very supportive, while one contractor did not recall any interaction with the implementer. Comments generally indicated staff was informative (3) and solution-oriented (1), while one contractor stated that the implementation team's technical and management support was critical to project success.

Assessment Incentive Option for Raters

Best practices (see Section 4 for more detail) indicate that programs should allow for the assessment incentive to go to the Rater or Property Owner because it maximizes program engagement from raters. Participating raters said that a great design benefit of the pilot is that it allowed the property owner to sign the assessment incentive over to the rater. Raters said it helps avoid property owners failing to pay raters and keeps raters interested in the program.

Multiple Tenant Benefits (Property Owner Self-Report)

Participating property owners say they can already see multiple benefits to their tenants and properties from the measures installed, including

- Lower bills (both expected and anecdotally observed);
- Functionality (new appliances, operating windows and powerful HVAC systems);
- Aesthetic improvements (new appliances, windows);
- Increased comfort; and
- Pride living in a sustainable/green community.

Use of a Single Point of Contact (SPOC) for All Multifamily Programs

Past research and literature on how best to reach the multifamily market suggests that programs should take a comprehensive approach that includes a range of measure types and audit levels. Measures should include in-unit and common-area measures and range in complexity from direct install measures to lighting, insulation and air-sealing. The pilot is adhering to this best practice both in its current program design and its SPOC approach whereby the SPOC is able to describe the range of multifamily programs available to property owners which, across them, provide a range of audit and measure options.

The PG&E SPOC provides property owners with information about the multiple multifamily programs available in PG&E territory and helps direct them to the appropriate multifamily program, which may mean participating in another program, such as ESA, prior to the EUC Multifamily program. Of the 7 participating property owners, 2 recalled speaking with the SPOC before participating in the pilot and found the experience helpful in clarifying and explaining program requirements.

Multi-Staged Screening Process

The pilot implemented an extensive screening process in an attempt to recruit a diverse mix of properties and identify property owners that were really interested in a deep retrofit. The screening process consisted of a short written questionnaire and then a longer phone screen questionnaire. BayREN's EUC Bay Area Multifamily Building Enhancements (BAMBE) program found a similar screening process effective.

Good Program Design Fit for Affordable Housing Properties

Past literature describing best practices for reaching the multifamily market suggest that multifamily programs should serve both low-income and market-rate multifamily properties but account for differences between the two types.[13] To encourage deeper retrofits in affordable housing, providing rate-payer/utility funding should occur at the same time the California Tax Credit Allocation Committee (CTCAC) allocates the Low-Income Housing Tax Credits (LIHTC) tax credits. In its current program design, the pilot is adhering to this best practice even though it did not have the opportunity to include market-rate properties beyond the assessment phase.

Interviews with implementation staff, PG&E managers and property owners revealed that affordable housing business models dovetail easily with this pilot's program design and offerings. Generally, affordable housing managed by non-profits is concerned with tax credit syndication every 15 years through the CTCAC. To receive the competitive CTCAC-administered tax credits, owners must complete energy audits and models of their properties.[14] Further, energy efficiency measures are included in the list of renovations that the California Tax Credit Allocation Committee uses to compare applicants, so completing energy efficiency upgrades, makes properties more likely to receive the CTCAC tax credits.[15] Five out of the seven participating properties were completing retrofits to qualify for the CTCAC tax credit. Some raters, who worked with affordable housing properties for the CTCAC allocation in the past, funneled their existing clients into the pilot.

Since tax credit re-syndication often requires an energy audit[16], this is usually part of a project budget from the beginning. A non-profit company that manages an affordable housing property will typically apply for program participation at this time. Tax credits run on a 15-year cycle, after which there is often an ownership turnover to facilitate tax credit re-syndication. To take advantage of tax credits, the building must be at least 10% more efficient than existing conditions. This motivates owners to take

13 Apartment Hunters: Programs Searching for Energy Savings in Multifamily Buildings (ACEEE; 12/2013)

14 CTCAC Regulations state "All rehabilitated buildings shall have improved energy efficiency above the modeled energy consumption of the building(s) based on existing conditions, with at least a 10% post-rehabilitation improvement over existing conditions energy efficiency achieved for each building." California Tax Credit Allocation Committee Regulations Implementing the Federal and State Low Income Housing Tax Credit Laws, January 29, 2014 Section 10325(f)(7) Minimum construction standards (A)Energy Efficiency, p.50.

15 Consistent with the earlier explanation in the text, any references to "CTCAC" tax credits are actually "LIHTC" tax credits since the CTCAC only administers the LIHTC tax credits. However, in this report, we choose to use the term "CTCAC tax credits" to stay consistent with how they are known within the industry. I.e., nearly all owners referred to them as "CTCAC" or "TCAC",

16 The audit process includes both modeling and verification stages. Professional energy auditors (i.e., California Association of Building Energy Consultants (CABEC) Certified Energy Plans Examiner (CEPE) and HERS II raters) model high- and low-rise buildings in Energy Pro and submit ECON-2 and .bld files, audit reports following Home Energy Retrofit Coordinating Committee (HERCC) Protocols, and project plans for existing conditions. During the verification phase, auditors submit "as built" files, summary of installed measures and statement of completion, project plans, equipment specifications, and bills of lading for appliances. Energy saving metrics include time dependent evaluation (TDV) (low-rise) or annual total therm and kWh savings (High-rise). (Sources: http://www.treasurer.ca.gov/ctcac/sustainable/scoring.pdf)

advantage of any program offering efficiency rebates. Interviews with property owners indicate that non-critical renovations often do not take place until this 15-year turnover.

Allowing for Property Owners to Choose Raters and Contractors

Interviews with implementation staff, PG&E managers and participating property owners revealed that allowing property owners to choose their own contractors and raters for major, expensive property improvements increased program interest and made participation easier for property owners. Participating property owners (all affordable housing) had existing relationships with raters and contractors whom they trusted. Five out of seven participating owners identified being able to use their own raters or contractors as a positive aspect of the program. We note that this is of value for affordable housing property owners who naturally work with raters for the tax credits mentioned above. Based on our interview findings, market- rate property owners do not typically work with raters as a natural part of their business operations. However, one large, national market-rate owner we interviewed hired a consulting architect who is trained in whole-building audits and EnergyPro modeling software to complete audits of the properties likely most in need of rehab.

Leveraging Raters' Existing Networks to Recruit Properties Worked Well for Gaining Affordable Housing Participation

The pilot greatly leveraged raters' existing relationships with affordable housing property owners. Raters were the main way in which property owners came into the pilot. Four out of the seven participating property owners discovered the program through raters. Raters shepherded interested owners through the participation process, often completing the initial interest form on their behalf and joining the telephone screening interview.

Leveraging raters' existing relationships is effective in reaching affordable housing properties but may not lead to many market-rate properties. Raters' existing property owner networks are based primarily on the work they perform for affordable housing owners, whose properties must be energy audited to qualify for tax status. As such, raters have many more relationships with the affordable housing property owners than with market-rate property owners. Implementation staff estimate that about 90% of rater leads were affordable housing and about 10% were market-rate. The 12 non-participating raters with whom we interviewed said they did little to no work in the market-rate multifamily retrofit sector and did not have a network of potential participants. More than a rater driven strategy is needed to reach the market-rate sector, which we discuss more in the next section.

3.2. What did not work well?

One goal of implementing a pilot is to try an approach and then gain knowledge to help refine both the program design and implementation in the future. This assessment found several key issues in the pilot including:

- Gaining market-rate's full participation in pilot period
- Communication amongst multiple parties during pilot retrofit projects
- Expectations around combustion appliance safety protocols
- Program paperwork and applications

- Tenant disruption
- Contractor participation requirements

Below, we describe each of these areas in more detail and the next section offers some recommendations for moving forward.

Gaining Market-Rate's Full Participation in Pilot Period

One of the primary issues with the pilot is that it was not able to recruit any market-rate properties for retrofits within the pilot timeframe. As such, testing the pilot's design and implementation with market-rate properties is still needed.

The pilot did attempt to get market-rate properties into the pilot. Program records indicate that the implementation team spoke to 7 market-rate property owners who expressed some interest in the program and screened 12 of their properties. Among these market-rate properties, 9 qualified for the pilot and 3 received assessments in the pilot period. However, none completed retrofits.

Table 6. Market-Rate Property Recruitment Summary

	Total Properties
Went through screening process	12 (100%)
Qualified for Pilot	9 (75%)
Received Assessments	3 (25%)
Completed Retrofits	0

There are several key reasons the market-rate properties did not complete retrofits during the pilot.

- **Timing:** the compressed timing of the pilot was not compatible with the market-rate properties' typical timing for retrofit investments nor did it provide for enough time to foster relationships with them. Investment in market-rate properties is often driven by the financial capital market and the financial tax year. Investors tend to invest money at the beginning of the year, so there is limited money to invest at other times. With constraints on time, the implementation team had to choose projects that were "ready" which ended up being affordable housing projects already undergoing renovation. The implementation team needs a longer time span to guide market-rate owners through several stages of consideration and planning (e.g., analysis, financing, contracts, and construction) for a deep retrofit. The market-rate property owners we interviewed said they planned to do energy efficiency improvements but wanted to plan them as part of a larger retrofit project and needed time to plan for it. Property owners must complete many stages of approval before project participation, and some cited a year or more as an appropriate amount of time to complete projects like these.
- **Lack of funding:** Another top barrier for market-rate properties was the lack of funding. Property owners not operating on reserves need to secure financing for big projects and this takes time. However, they may only start to think about securing the financing once assessment results are available.

There are also general barriers to reaching the market-rate multifamily sector that were discussed by all parties interviewed in this evaluation.

- **Split Incentives:** In the multifamily sector, the split incentive barrier stems from the owner being the party who pays for energy efficiency upgrades, yet tenants directly benefit from them in terms of the lower utility bills they typically pay.
- **Return on Investment:** Best practices suggest market-rate property owners are focused on the bottom line (profitability) so high incentives (covering the majority of both their assessment and upgrade costs) will help increase participation. Interviews with property owners confirmed that return on investment is key for market-rate properties. As a general rule of thumb, a payback period of three years and under is very attractive, a payback period of under 5 years will be considered, and a period of over 5 years is undesirable.
- **Owners understanding of retrofit potential before the assessment:** Interviews with implementation staff indicated that some owners may have a "chicken and egg" problem regarding whether or not to participate in the program. Owners want to know how much upgrade incentives their properties will qualify for so that they can do an analysis of whether participating in the program is worth it for them. However, in order to have this information (i.e., scope of work and modeled energy savings), they have to spend several thousand dollars on the assessment.
- **Unit turnover timing:** Interviews with implementation staff indicated that market-rate business models are based on at least 90% tenancy. This makes owners hesitant to disturb tenants and so they avoid making upgrades until the unit is empty. However, it is unlikely that all the units in one building become vacant at the same time making deep retrofits that require treating the whole-building unpalatable to market-rate owners.

There are also some pilot design issues that make reaching market-rate properties challenging including:

- **Lack of rater support for market-rate sector:** Both PG&E and implementation staff believe that it will be necessary to recruit more raters to expand the program. The program is designed to be rater-driven and, as such, the implementation team believes it will need to rely on more than the ten raters who enrolled in the pilot. This is at odds with the participating rater who recommended a closed rater/consultant model (similar to SCE and SCG's pilot approach) by selecting a small number of raters to perform all rater services on all projects. That rater believes that with only a few rater firms, each rater has sufficient work to invest in marketing the program, they are adequately trained and they can provide standardized reporting. Among non-participant and dropout property owners, several expressed dissatisfaction with the energy raters that gave them assessments. Interviews with non-participating raters produced two notable findings. First, these raters indicate that they like the program but are not interested in pursuing much business in the market-rate retrofit sector until they think there is a market for it. Second, even after multiple attempts and a $100 incentive, it was difficult to reach non-participating raters which may be indicative of how difficult it will be to get more raters to support this program.
- **Lack of a success story in market-rate to champion in marketing:** During the pilot, marketing was minimal and generally relied on the contractor and rater networks to help drive property owners and generate interest. This was sufficient to enroll 500 units into the pilot, but outreach efforts will have to expand to meet full program goals. The implementation team expects to develop marketing messages and outreach tactics that raters can use to recruit market-rate owners, with a particular focus on owners of multiple properties. Implementation staff mentioned that two participating

raters have found it effective so far to position the program in business terms to market-rate property owners. This includes addressing ROI, financing options, different retrofit options, and stressing that raters represent the owner throughout the program participation steps thereby assuming the potential administrative burden. The raters and property owners we interviewed collectively suggested the following messaging and outreach methods to reach market-rate property owners:

- Outreach: Interviewees suggested case studies highlighting a market-rate property, targeting financing organizations with program information, encouraging contractors to market the program to their contacts and focusing outreach at times when a property is sold as this is when there will likely be extensive renovations taking place.
- Messaging: Specifically, the dropout and non-participant owners cited incentives, ease of use/low administrative burden, the opportunity to upgrade a number of measure types all at once, and on-bill financing as benefits to highlight to market-rate properties. They also mentioned that messaging that highlights the program's alignment with LEED certification (if it can) and cosmetic improvement might resonate. Further, raters mentioned that all messaging to market-rate properties needs to be framed in financial terms so messaging should highlight the expected energy cost savings and the return on investment.

- **Lack of a green rating system:** The pilot does not offer any green rating system or label that the owners can use to market to perspective tenants. Market-rate multifamily owners see value in energy and green ratings from both a marketing and tenant retention perspective. Interviews from this pilot study suggest that market-rate property owners will be more interested in program participation if it helps them with LEED certification.
- **Assessment incentives not aligned with market-rate needs:** Both PG&E and implementation staff believe that the assessment incentives should be reconsidered. Originally, the implementation team believed that it would take a large assessment incentive to motivate affordable housing customers to participate. Therefore, the assessment incentive is twice as large for affordable housing properties as it is for market-rate properties. However, in many cases affordable housing property owners already hire raters to complete assessments to meet CTCAC allocation requirements. Four of the seven affordable housing participating property owners said the assessment incentive covered about 60% of the assessment cost.17 Participating and non-participating raters also suggested increasing the market-rate assessment incentive to the level offered to affordable housing. Market-rate property owners say that reducing the cost of an energy assessment is a key factor in encouraging participation from them. Without this incentive, the property owner must pay a significant amount of money to determine if they would qualify and this is an unattractive risk. Thus, the program should retain the assessment incentive generally, and increase the assessment incentive for market-rate properties specifically.

Communication to Multiple Parties During the Retrofit Project

Once properties began the pilot energy upgrades, more than half the participating owners found that there were cases of communication breakdown between the owner, rater, contractor, implementation

17 Although we did not ask owners directly, based on other responses in the interviews, the remaining 60% appeared to be covered by various funding sources including bank loans, existing capital, financing from state agencies, and grants.

staff or PG&E. Several contractors also mentioned issues with communication. Given that whole-building upgrade programs involve multiple stakeholders, multiple steps and multiple incentive types, best practices suggest that these programs should offer property owners one point of contact for all possible project participation even across several months. This helps overcome technical and program confusion among owners as well as transaction costs. This a key component to participant satisfaction and appeared to happen inconsistently during the pilot. Raters were sometimes the key point of contact and at other times the implementer was or in some cases, the property owners did not know who this was supposed to be. Participating contractors suggested that projects start with a kick-off meeting and include all key parties involved.

Expectations around Combustion Appliance Safety Protocols

Program design states that all critical CAS issues need to be repaired before the project can be completed and upgrade incentive funds are disbursed. However, CAS repairs may represent costly additions to the construction project in terms of both time and money. When the same piece of in-unit equipment, e.g., water heater, causes CAS issues, the repair may represent thousands of dollars since the issue is multiplied across multiple units. The budget problem is compounded when CAS issues are not directly related to the measures receiving upgrade incentives.

Similar to lessons learned from other CA multifamily pilots[18], there was some concern amongst property owners regarding the added liability of knowing that there were health and safety problems in their buildings without knowing in advance what the problems might be and if there was sufficient budget to correct any problems. One of this pilot's goals was to better understand the CAS issues and so they could be addressed in the full roll-out of the program. Program requirements allow for contractors or raters to test for and oversee the repair of CAS issues, although raters primarily played this role in the pilot.

Of the 7 participating projects, 5 identified CAS issues that needed to be resolved prior to construction. After construction, 3 properties had additional CAS issues that needed to be resolved during the test-out phase. The primary CAS issues identified were gas leaks across multiple end-uses and in varying locations around the properties. In some cases, PG&E needed to resolve the matter and, in other cases, the contractor could resolve issues. More details on the CAS issues identified in each project are included in the Project-by-Project Descriptions.

The participating raters believe CAS is important and critical; however, they are concerned that CAS prevents owners from participating because 1) owners do not connect it to energy savings and 2) owners may think paying raters for extensive CAS testing on test-out is too costly. Raters also noted several issues that surfaced during the pilot; CAS testing can be an extensive process during the verification stage when 100% of affected units require testing, contractors did not understand CAS and did not want to take responsibility for it, and owners did not understand CAS testing requirements and were frustrated by how it increased rater costs.

Participating property owners said that the CAS issues delayed project schedules because CAS issues have to be remediated immediately. However, in two cases, CAS issues caused tenants to be without hot water for a few hours or a few days.

18 Lessons Learned through Piloting Energy Upgrade California™ Multifamily Programs; HMG TRC, July 2013

Compounding the CAS issues is how PG&E Gas Service Representatives (GSRs) are structured for multifamily customer issues. Remediating CAS issues requires that PG&E technicians are present at the project site, yet the PG&E GSRs are structured to assist single-family homes not multifamily. While a Multifamily CAS issue may represent several units, the GSR process is designed to only handle one unit at a time. Therefore, a rater overseeing a CAS issue remediation may need to spend 30-45 minutes on hold before talking with a GSR for each unit and set up multiple PG&E appointments. PG&E program and implementation staff are working to prevent this issue from becoming a barrier in the future.

Program Paperwork and Applications

Raters and property owners had difficulty submitting complete and accurate paperwork for participation. This process takes place primarily over email. These issues are unsurprising given that the pilot had to create the necessary forms and instructions while the program was launching. Still, the back and forth with raters and contractors over missing information caused an administrative burden on the implementation team (Build-It-Green). Much of this will work itself out over time with training and communication. Although generally raters found the paperwork and application processes acceptable, they made some suggestions for improvement including a web portal, which could take advantage of auto-populating fields, and bringing clarity to reporting requirements (see Section 4.2.3).

Tenant Disruption

The program should minimize disruption of tenants to the extent possible. The project team could inconvenience tenants multiple times: at the assessment, fixing CAS issues, measure installation, and verification. The program minimized disruption by coordinating the QA/QC process with the rater's test-out procedures. In some cases, tenant disruption was not an issue during the pilot, 27% of the total units were unoccupied during construction (one property with 20 units was completely unoccupied because it was undergoing a full rehabilitation, another property said that roughly half of the units treated were not rented at the time of participation). In many cases where the units were occupied with tenants, the tenants were asked to leave temporarily for 3-5 days during construction. Property owners indicated that tenants benefitted from participation more than they were inconvenienced by it. Still, there is room to minimize disruption to tenants going forward.

Although a degree of tenant inconvenience was expected during the retrofit, more than half of the owners (4/7) noted that the program added to the inconvenience. The main issues involved project scheduling and the test-out procedures. Property owners typically notify tenants up to three days in advance of any entry. Some tenants rescheduled work and other activities around the project schedule and when projects were delayed they had to reschedule again.

Contractor Requirements

Interviews with participating owners and contractors indicated that it was difficult for some contractors to participate in the program due to the liability level specified in the contractor compliance and agreement forms.[19] Some had issues with the high indemnification clause required of the contractor, as well as with background checks of employees and sub-contractors. Three of seven participating owners identified contractor requirements, specifically the contractor background checks, as their main hurdle

19 Additionally, during contractor enrollment, the implementer verified the contractors had active Contractors State License Board (CSLB) approved licenses.

to participating in the program. Three of seven contractors expressed dissatisfaction with the compliance and agreement forms and background checks for liability, privacy, and cost reasons. These contractors found the background check for subcontractors extremely tedious and contrary to industry practice. Notably, this was not as much of an issue in the EUC single-family program. These requirements are more time-consuming and expensive in the MF program because of the increased volume of contractors and subcontractors working on a project.

3.3. Layering of ESA and the EUC Pilot

PG&E program managers believe it is important for affordable housing properties to take advantage of the free, energy savings measures offered through PG&E's ESA program before they participate in the pilot. However, this could be a burden on tenants if the property also enrolls in the EUC Multifamily pilot. Tenants could become irritated by frequent access to their homes by multiple contractors during a short time span. This evaluation could not explore the layering of ESA and the EUC program because none of the properties participated in the ESA program near the time of the pilot. Six of the 7 participating properties participated in ESA between 2000 and 2012. However, the implementation team and PG&E staff had to manually look up each property in ESA's records to obtain this information, which took several days to accomplish. Clear communication is needed between the ESA contactor and the EUC-MF rater to ensure that raters include ESA-installed measures in baseline conditions. There is no protocols to convey this information currently in the pilot design.

3.4. Perspective on Whether Energy Savings Can be Verified

Quality Assurance and Quality Control

Program records and participant owner interviews support that the assessment (test-in) and test-out phases of the pilot identified and remediated CAS issues, which certainly led to safe, energy saving upgrades. At the end of the retrofit phase, the raters must complete a full test out of the project to ensure all measures were installed correctly and any CAS issues were properly remediated. The raters submit verification reports including photos of installed measures.

The program implementer also had several QA/QC processes in place to oversee raters and contractors. At the assessment phase, implementation staff does a desktop review of every project including the EnergyPro modeling and the overall assessment. At the retrofit phase, implementation staff performs a desk review and then creates a field QC plan, involving inspection of at least 15% of each type of measure-type. Notably, implementation staff also use the field check as an opportunity to further train raters. The participating raters noted that they liked the additional interaction with implementation staff at the verification stage. All interviewed parties indicated that the QA/QC processes ensured safe energy upgrades. However, we found conflicting and missing information across project documentation. We acknowledge that QA/QC and verification forms were in development and were not a priority during the pilot. We also recognize that implementation staff did not have time to fully review all documentation and check it for consistency prior to the evaluation. However, we note the following issues for consideration when moving forward with the full program:

- The QA/QC forms appear to be a good source of information for an evaluation, but we found that they were not always complete.
- When there was information present, we found conflicting data across multiple sources for the same project. For example:
  - Information found within the QA/QC forms is not always consistent with the measures found in the EnergyPro models and the verification reports
  - Information from the Econ reports (EnergyPro results with updated measures based on the test-out verification) does not always agree with the information found in the verification reports

It is possible that by creating rater and contractor portals and taking advantage of auto-populating fields, some of the inconsistencies could be resolved.

Verifying Energy Savings

PG&E may want to obtain an early indication of the savings. Current saving estimates are based on energy modeling. The energy modeling uses the actual energy usage of the base building (assessment data) + changes (energy conservation measures) to establish overall energy savings. Infiltration savings are not incorporated in the estimates at this time. The program offers various measures, such as window replacements and wall insulation, which may change the infiltration rate. Reductions in infiltration rate will generally reduce energy use for heating, so the program may be underestimating savings by ignoring this factor. However, accurate measurements of the change in infiltration would be technically challenging and costly, especially in multifamily buildings. Thus, it may be difficult for the program to substantiate a claim of savings based on changes in infiltration rate. However, duct-blaster tests are conducted to account for duct improvement savings. Further, Title 24 is not used as the baseline for savings even though some of the affordable housing properties were undergoing retrofits at the time to meet Title 24 standards. The pilot team should discuss whether Title 24 should be used as the baseline for savings in EnergyPro modeling, especially for affordable housing.

Modeled savings can provide useful information, but can be less precise at times, especially if not calibrated. To check on the modeled savings estimates, the pilot has two main options: a pre/post billing analysis or calibrated engineering simulation model. The evaluation team looked across the project information to determine if and when a billing analysis could be conducted for early insight into actual energy savings[20]. There are a few key things that look promising for potential billing analysis:

- **The savings appear to be high enough:** The pilot design requires a threshold of 10% (estimated in EnergyPro) and therefore may be large enough to detect in a billing analysis.
- **There appears to be sufficient sample size:** Billing analysis needs a relatively large set of data and longitudinal data from the same people to find savings. With 7 properties and 513 units there should be enough units to conduct a billing analysis, even when considering turnover. However, if tenant turnover is higher than expected, it could limit the population size for billing analysis.

20 Calibrating the EnergyPro models may allow for similar information, but may introduce possible bias given that parameters that affect savings substantially are set as "schedules" within EnergyPro.

- **The energy use across units are relatively similar:** Typically, the homogeneity of energy use within a multifamily building is relatively high[21], which means that the billing analysis can more easily find differences when they are actually present. While the number of occupants and plug loads may vary from unit to unit, the square foot available for all households is similar, helping to drive somewhat similar energy use (at least in the order of magnitude to which billing analysis is sensitive).

However, the following may make billing analyses difficult at this time.

- There is variation across properties in what is master-metered and what is individually metered so a billing analysis on units may only pick up on some savings (e.g. one property has master metered gas for all water heating at the property but all other usage in the units is individually metered).
- Properties participated in November 2013 and December 2013 therefore only 2-3 months of post-retrofit data is available at this time. Billing analysis typically requires 12 months of pre-retrofit and 12 months of post-retrofit billing data to account for savings across multiple seasons. While an early look at the savings could be done with 3 months of post-retrofit billing data to determine winter/spring savings such an analysis would provide mainly heating savings, which is master metered at some properties. An early analysis of all 7 properties would be better after the summer to capture cooling savings.
- Program records do not track the meter numbers for participating properties on the master or unit level. Therefore, we do not currently know how well PG&E can match the meter numbers/billing information to the participant's addresses. Some stakeholders mentioned difficulty in getting Gas Service Representatives to match meter information on-site while resolving CAS issues therefore this could be an issue for the pilot but the magnitude is still unknown.

3.5. Suggestions for Improvement

While some of the findings in this report apply to pilot processes for either type of participant, to really understand whether this design and implementation approach is effective for market-rate facilities, the utilities will need to run a second stage of the pilot that specifically targets market-rate buildings. Below are recommendations to (1) help build towards a full-scale pilot with market-rate buildings, (2) streamline pilot processes, and (3) help ensure that savings can be verified. Notably, each of the participating stakeholders in this pilot offered a list of suggestions for improvement. Specific changes recommended by each stakeholder can be found in Section 4.

Building toward a Full-Scale Pilot for Market-Rate Inclusion

The barriers are large for market-rate building owners and a pilot with this group will be needed to determine if they are insurmountable. Based on the best practices review and all parties interviewed in this evaluation, we recommend the following to try to reach market-rate properties:

- **Provide the same assessment incentives for market-rate and affordable housing:** To gain some initial market-rate properties, the pilot should try increasing the assessment incentive payment for market-rate properties so it aligns with the offering for affordable housing. Increasing the assessment incentive, at least in the short-term, might help persuade more market-rate owners to

21 Known to be true based on the evaluation team's previous experience with multifamily properties in SMUD territory.

complete assessments. Having some success stories with market-rate properties will help with marketing by starting word-of-mouth and will provide the content for case studies/marketing collateral that will help more raters begin to support the pilot because they see that there is a market for it and will provide the content that raters need to sell the pilot. Many stakeholders in this evaluation suggested offering free assessments to market-rate property owners however, PG&E is concerned that this would lead to many costly assessments on properties with no intention of completing retrofits.

- **Offer a green rating label that already has market recognition through participation in this program or assists in establishing other ratings such as LEED:** Incentives are influential but the pilot may also provide value by offering technical assistance in the form of facilitating the process toward certifications such as LEED or some other green rating.
- **Develop a marketing and outreach strategy that engages market-rate when they are doing major renovations:** Marketing for this sector should include a long-term strategy of staying in front of market-rate property owners. All the market-rate property owners we interviewed referenced multi-year cycles for undergoing major rehabs—a time when participating in the pilot might increase energy efficiency retrofits and also a time when units are likely empty. This will require a tracking system that is frequently updated and setting up strategic times throughout a year to follow-up with property owners. The tracking system would set up a schedule for each potential property documenting when they might be in a position to make a decision, i.e. fiscal/budget planning periods or timing of next major investment project, and then having a key person assigned to each account that is responsible for standard (check in twice per year with a reminder of the pilot) and catered follow-up (check in at a strategic time such as when they do budget planning).
- The strategy should consider the following outreach methods and marketing collateral.
  - Partner with local industry networks and associations to market market-rate multifamily owners and managers directly. As the pilot progresses, it should consider the associations that interviewee's mentioned in this study (Section 6).
  - Encourage contractors, raters and property owners to market to their existing networks through a potential marketing/referral incentive.
  - Develop a case study that highlights the success of the pilot for a market-rate property (other IOUs may already have a case study that PG&E can leverage until it has one). The case study needs to show the following: proven ROI in less than 5 years (1-2 years is ideal) and owner-observed tenant benefits. The case study should indicate that EUC upgrades lead to better comfort, safety and energy savings, going green, higher rents, increased tenant retention, increased tenant attraction to the property and easier management (decreased maintenance and complaints).
- **Offer On-Bill Financing As Soon As Possible:** PG&E managers mentioned that by providing financing, the pilot is likely to increase participation. In interviews, affordable housing owners were somewhat interested an on-bill financing option but all market-rate property owners (3/3) we interviewed said on-bill financing is an attractive option.

Improving Pilot Operations

We recommend process improvements on three fronts: (1) communication amongst project teams, (2) combustion safety protocols, and (3) streamline paperwork.

- **Improve communication amongst project teams by assigning a project lead and assembling kick-off meetings:** It will be important that this pilot identify who the Project Lead is and set up an infrastructure to allow this person to be informed of project status and pilot processes at all times. Protocols for this will become increasingly important as this pilot increases in scale and the implementer may not be able to do as much handholding with participants as it did during the initial pilot period. Also, encourage raters (or other Project Lead) to assemble a project team kick-off meeting. Determine who the Project Lead is prior to this meeting and try to encourage everyone to communicate with that person while keeping others in communication as much as possible. During the kick-off meeting, the lead should lay out a clear schedule for the project that incorporates the main steps of the pilot and notes where rescheduling might occur with estimates of alternative schedules.
- **Improve communication around CAS procedures and review the protocols** so that participants have more knowledge about CAS and how it might affect their prospective projects. The pilot needs a good definition of testing and remediation requirements to help manage property owner expectations and encourage participation. The pilot should encourage the rater or other project lead to map out a schedule with contingencies for CAS issues. When units are occupied, the raters should prepare the project team for more tenant inconvenience than a typical rehab.
- **Automate the screening process:** While the screening process went well to get participants in the pilot, there is some question on how scalable this process may be for the full pilot. The current process is a "high-touch and intensive" process that could become too costly. Program staff is currently considering a more automated process for screening potential participants.
- **Revisit contractor requirements:** We recommend that the pilot meet with PG&E's legal team to discuss potential options for reducing contractor requirements such as background checks on all staff. If this cannot change, better explanation to property owners, raters and contractors is needed to explain the reasons for these requirements.
- **Develop protocols for communicating ESA participation to raters:** Clear communication is needed between the ESA contactor and the EUC-MF rater to ensure that raters include ESA-installed measures in baseline conditions. There is no protocol to convey this information currently in the pilot design. We recommend that the pilot develop a protocol for sharing ESA information between PG&E and the implementer. The implementer will also need to set up a protocol for sharing this information with raters during the assessment phase. Information should be frequent and standardized including the measures installed, where the measures were installed (including property address, common area or in-unit, unit numbers and date of installation.)

Verifying Savings

We recommend the following so that measures are well-documented in future program records.

- **Put processes in place to assure that the Quality Assurance and Quality Control (QA/QC) forms are complete.** Specifically, there are two current variables in the QA/QC form that should always be complete.

- Identify the installed measures: this is a Y/N variable that should have either Y or N in each record.
- Location of installed measures (i.e. in units, common areas, or exterior): This variable should be present and completed for each measure type.

- **Add two new variables to the QA/QC form to allow for the natural variation that occurs in the field**.
  - Add a field such as "Completeness of installation". Currently, information found in the QA/QC form may say something like "windows not completed", "Did not complete verification – looked like old and new insulation", "Floor insulation not all installed". This should be a text field, but with training around what type of information should be included. For example, if it is noted that windows were not completed, it should also state something like 7 out of 10 windows not installed (or conversely, 3 windows out of 10 installed).
  - Add a field for quality of installation and create protocols for the raters to assess whether measures were installed properly or to manufacturer specifications.
- **Create standardized methods and processes to eliminate missing and conflicting data**. **Standardization could include the following:**
  - Creation of a checklist of the required supporting documentation (i.e. contractor invoices, photos of installed measures, etc.)
  - Creation of simple but uniform data collection procedures and tools to assemble on-site findings from the initial assessment and the verification stages (i.e. data collection forms, QA/QC forms, etc.)
  - A verification reporting template to be used by all raters. While not dictating exactly how the data should be presented, the implementer should indicate the minimum level of information required in the report and the specific format of that data. This will help to eliminate any consistency issues. For example, it would be useful to include EnergyPro results as either a table or an appendix in the verification report so that energy savings are always present.

We recommend the following to determine whether a billing analysis is possible for the pilot:

- **Perform a test match for billing data:** To assure that billing data from individual units can easily be found and that the evaluation team could track turnover, we suggest that PG&E perform a trial run and attempt to pull all the individual unit energy use (12 months pre and as many months post as possible) from a single project.
- **Update project information:** To improve the likelihood of any evaluation team using the final and best measure data within a billing analysis, we recommend that PG&E and their implementer, Build It Green, create and maintain a database of only final measures with specific dates of installation. Additionally, we recommend that there be QA on the database to assure that savings are correct.

4. SUMMARY OF INTERVIEW FINDINGS

4.1. Participating Owner Findings

4.1.1. Methodology

We interviewed owner representatives for each of the 7 properties that completed retrofits through the EUC Multifamily pilot. Respondents were typically project managers at non-profit affordable housing management organizations who oversaw multiple properties and are referred to as participating property owners in this report.

An interview guide was prepared for owner interviews. Some questions were skipped due to time constraints or the respondent's familiarity with different topics. When questions were not asked of all 7 property owners, we show the number of respondents associated with a finding followed by the number of owners who were asked the question (e.g., 5/6). When all seven respondents were asked a question, we provide a single number (e.g., 5) to denote how many owners are associated with that finding.

4.1.2. Main Findings

What Worked Well

Overall, property owners are satisfied with the pilot program. Average satisfaction ratings are high (7.9; 0-10 scale). None of the owners mentioned any concerns about the quality of the work (7/7) and all would consider participating in the pilot again. The main reasons for high satisfaction ratings include:

- **Receiving incentives (7):** many owners were undertaking large scale rehabs projects already and appreciated being able to integrate the EUC Multifamily incentive as additional revenue
- **Being able to use raters or contractors they had used in the past (5):** several owners stated that being able to work with their trusted rater or contractor was an important aspect of their positive experiences in the pilot
- **Tenant benefits (4), including:**
  - Lower bills (both expected and anecdotally observed) (4)
  - Improved functionality (new appliances, operating windows and powerful HVAC systems) (2)
  - Aesthetic improvements (new appliances, windows) (2)
  - Increased comfort (2)
  - Pride in sustainable community (1)
- **Interaction with implementation staff (3):** Some owners praised key implementation staff by name, describing them as "phenomenal", "fabulous", etc. Owners appreciated both the technical and administrative assistance.

Consistent with owners' high overall satisfaction, the pilot met or exceeded nearly all owners' expectations (6/7; see Table 7). Nevertheless, owners acknowledged the program's pilot status and stated that some issues were expected.

Before participating in the pilot about half of the owners spoke with the PG&E SPOC about the different multifamily programs available to them (3/6). Two found the experience helpful in clarifying and explaining multifamily program requirements, while one could not recall his experience.

Overall, owners were satisfied with the implementer's professionalism and the information they provided:

- Professionalism satisfaction ratings are high with an average score of 8.3 (range 7-10 on a scale from 0 to 10). We asked owners to consider such things as responsiveness, follow-up, answering questions and technical support. Two owners praised multiple implementation staff who work directly with multifamily participants.
- Information satisfaction was rated 7.7 (range 4-10 on a scale from 0 to 10). We asked owners to consider such things as how valuable, informative, clear and relevant the information was to them. Owners mentioned contracts/agreements (3), PowerPoint presentations with implementation staff (2), program brochure (1), webinar (1), email (1), and conference calls (1).
- Overall, owners are satisfied with their raters. Satisfaction scores average at 8.6 and range from 7 to 10 on a ten points scale. Table 7 lists both the positive and negative reasons owners gave for their ratings. Three owners gave only positive feedback; one owner provided only negative feedback; and three owners provided both.

Table 7. Reasons for Satisfaction with Raters (multiple response)

	Reason	Number of owners stating:
Positive Reasons	Did a good job	3
	Familiarity with owner's projects generally	2
	Provided good administration	2
	Knowledgeable about EE impact	2
	Pro-active/Reached out to owner	1
	Knowledgeable about the pilot	1
	Good communication	1
Negative Reasons	Poor communication/ coordination with implementation	2
	Poor communication with owner	1
	Not totally knowledgeable about pilot requirements	1
	Had to spend more money than intended	1

Most owners are satisfied with their contractors, giving a mean satisfaction score of 8.3 (range 6-10, scale 0-10). However, one owner who is very dissatisfied with his contractor, declined to give a score for fear of retribution. The true mean satisfaction score is therefore likely lower than 8.3. Table 8 lists both the positive and negative reasons owners gave for their ratings. One owner gave only positive feedback;

two owners provided only negative feedback; three owners provided both; and one owner did not provide feedback for the rating.

Table 8. Reasons for Satisfaction with Contractors (multiple response)

	Reason	Number of owners stating:
Positive Reasons	Knowledgeable about owner's projects generally	2
	Work quality	1
	Completed project on time and on budget	1
Negative Reasons	Sometimes did not handle the unexpected well	2
	Fell behind schedule	2
	Very disorganized	1
	Contractor does not coordinate across a SF-MF projects well	1
	Poor communication	1

What Did NOT Work Well

Owners generally had a positive experience but cited three main areas in need of improvement:

- **Inter-party communication:** More than half the owners (4) found that there were cases of communication breakdown between the owner, rater, contractor, implementation staff or PG&E. As a result, owners had to manage communication and/or the project more than expected.
- **Tenant inconvenience:** Although a degree of tenant inconvenience was expected during the retrofit, more than half the owners (4) noted that the pilot added to the inconvenience. Often, tenants had to adjust their work schedules to be home during construction and test-out phases. The main issues involved project scheduling at these times. In one case, the construction project was delayed trying to participate in the EUC single-family and multifamily programs at the same time; in another case rater verification and test-out procedures took longer than anticipated. Owners notified tenants of schedule changes and tenants were upset that they had to adjust their schedules again.
- **Pilot requirements:** Three of the owners cited issues with contractor participation requirements:
  - One owner believed that the contractor employee background check was unnecessary because past infractions (e.g., DUIs) are unrelated to employees' abilities to install EE measures in multifamily buildings.
  - Another owner noted that sub-contractor background checks are not industry practice and found the requirement severe since there could be hundreds of employees on one large project where sub-contractors already report to the general contractor.
  - Finally, another owner found the legal indemnification clauses 1) unfair because PG&E was not a party to the construction yet could place all liability on the contractor if a tenant made a baseless claim; and 2) unnecessary because the contractor had already indemnified the owner for any issues.

Property owners also noted a number of combustion appliance safety (CAS) issues throughout the retrofit. CAS issues delayed project schedules so they could be remediated immediately. In two cases, CAS issues caused tenants to be without hot water for a few hours or a few days.

Drivers of Pilot Participation

Owners heard about the pilot in a variety of ways, which include:

- Raters (4)
- Multifamily Green commission (1)
- Colleague passed on an email (1)
- Word of mouth (1)

CTCAC tax credits are a major driver for energy efficiency upgrades in the affordable housing sector. Concerned with tax credit syndication every 15 years, non-profit property owners had already embarked on energy efficiency projects including energy audits and retrofits that aligned well with the pilot structure (5/6). In addition to monetary benefits, owners mentioned that energy efficiency upgrades help reduce operating expenses, and lower utility bills for tenants. Two owners further mentioned that "green" improvements are generally important.

Project timing was critical to pilot participation; all property owners noted that a major retrofit was already planned or underway before the pilot. Table 9 shows the reasons owners gave for deciding to participate in the pilot.

Table 9. Reasons for Participation

Reason	Number of owners stating
Money that helped cover renovation/rehab projects already planned or being done	7
Would benefit tenants	1
Assured by the performance structure of the incentive that the work would be high quality and generate savings	1
Interested in bringing green upgrades to the property	1
Would be able to use own contractor	1

Perspective on Market-Rate Sector Decision Making

These affordable housing owners had limited perspective on what motivates energy efficiency upgrades in the market-rate sector. Only two offered opinions on the possible differences in market-rate decision-making. One thought that aesthetic considerations would be a higher priority than energy efficiency since these improvements might have a quicker ROI. The other thought that EE improvements in the market-rate sector might increase comfort and thereby help retain tenants.

Overcoming Barriers to Pilot Participation

Owners also described the biggest barriers they had to overcome before deciding to participate. As shown in Table 10, these generally fell into two categories: additional costs of participation and contractor requirements.

Table 10. Biggest Barriers Owners Had to Overcome Before Participating

Biggest Barriers	Number of owners stating
Weighing the additional upgrade costs against the incentives	3
Contractor requirements	3
Contractor indemnity clause	*1*
No contractor staff with past sexual or DUI crimes were allowed to work on the project	*1*
Having to run background checks on sub-contractors	*1*
Weighing the administrative time costs against the incentives	1
Signing up rater used in the past	1
Figuring out how to pay contractor a flat, per unit base fee and letting the contractor collect the performance-based incentives on top of that	1

Assessment Incentives

Owners appreciate the assessment incentive, which they describe as "fair", "helpful" and "great". Although the incentive was described as less influential in deciding to conduct an energy assessment, which is a CTCAC tax credit requirement, the incentive greatly influenced owners to participate in the pilot. With four owners reporting, the assessment incentive covered on average about 60% of the assessment cost.

Upgrade Incentives

Owners appreciate the upgrade incentive and referred to it as "great reward", "really happy" or "good". Generally, it greatly influenced them to participate in the pilot. However, it did not necessarily influence them to complete all the energy upgrades, as these were often part of original rehab plans and applying for CTCAC tax credits. Owners found it difficult to estimate the percentage of the energy upgrades the incentive covered since the rehab projects tended to be large projects and property owners did not receive itemized costs for program-incented measures. With only two reporting, one owner estimated about 1% and another estimated 20%.

ESA Participation

Six of the 7 participating properties did receive measures through the ESA program but all were installed prior to 2013 (ESA participation ranged from as early as 2000 to as recently as 2012). It is not surprising that given the varying dates of past ESA participation, most owners are unaware that their properties participated in the ESA program in the past; only 1 property owner recalled participating.

On-Bill Financing

We asked owners about an on-bill financing (OBF) product PG&E is considering. The utility would provide financing for a project based on the estimated bill savings. Owners would pay the loan installments as line items on their monthly utility bills. Owner reaction was mixed, but overall, cautiously positive:

- 5 were somewhat indifferent about the idea
- 2 thought it sounded more appropriate for market-rate owners
- 1 thought that it would complicate accounting because their company separates utility costs and loan costs in their accounting tools, therefore a combined charge for utility and loan costs would complicate accounting procedures.

In addition, four owners indicated that they would need more information about OBF before making a decision.

Marketing and Outreach for Affordable Housing

Property owners provided a range of responses as to how more property managers and owners could be made aware of the pilot:

- Reach out to financial organizations to encourage pilot participation as rehab financing is secured. These include State Housing Finance organizations (e.g., CA Housing Finance Agency, the State Department of Housing Community Development) and major banks (e.g., Bank of America, Union Bank, Citibank)
- Coordinate with the CTCAC as many affordable housing owners are focused on securing these tax credits
- Present at the Non-profit Housing Association of Northern California's conference held in San Francisco every year
- Advertise in industry publications such as Affordable Housing Finance (AHF) magazine
- Leverage contractors' client networks to provide outreach to owners
- Phone calls from PG&E to owners

Six owners provided suggestions for messaging, including; emphasizing the incentives, ease of participation (hassle-free when raters handle the administration), coordination with affordable housing tax credits, and raising tenants' quality of life. Some owners suggested case studies with past participants.

Marketing and Outreach for Market-Rate

Owners suggested market-rate specific marketing and outreach approaches. Suggestions made by the two owners who have direct experience with market-rate properties are indicated by an *.

- The online-bill financing product may be an attractive option for market-rate owners. (2)*
- Help owners understand the anticipated savings so they can calculate out the benefits in terms of savings. (1)*

- Inform market-rate owners that the pilot applies to energy improvements, which owners can highlight in their marketing materials to attract prospective tenants who are increasingly responding to environmental concerns. (1)

4.1.3. Suggestions for Improvement

Remove Some Contractor Enrollment Requirements

Three owners suggested changing contractor requirements:

- Remove the contractor indemnification clause from the contractor agreement form since it is unfair and unnecessary. (1)
- Contractor staff who fail a background check for prior offenses should be allowed to work on the projects since these offenses do not impact their ability install EE measures in multifamily buildings. (1)
- Do not require background checks for subcontractors since it is extremely tedious and not industry practice. (1)

Improve Rater Assessment Report

Most owners remember receiving the rater's assessment report (4), while two others remember talking about the results with the rater (2) and another does not remember. Regardless of how the assessment results were received, most owners were primarily concerned with the savings levels they reached. Owners made the following suggestions for how to improve the report.

- Include before and after improvement metrics e.g., energy, cost and utility bill savings. (2)
- Include before and after effects on health and safety; e.g., carbon monoxide counts. (1)
- Make it clear, basic and non-technical. (1)
- Include an executive summary and pare down content to the best or most important courses of action. (1)
- Clearly list the tradeoffs between project costs and savings, explain how both relate to comfort and the overall budget. (1)
- Place automatically produced or generic portions of the report at the end. (1)

Improve Communication, Outline Expected Steps and Timelines

Owners made several comments throughout the interviews that implied increases in communication and reductions in scheduling delays would help streamline the pilot. One owner made the following suggestion:

- Identify the project's "point person" to unify all the lines of communication between all the parties.
- Lay out a clear schedule for each project that incorporates the main steps of the pilot and notes where rescheduling might occur with estimates of alternative schedules.

Improve Application and Paperwork

Overall, among the six owners who provided feedback, most (4) found the paperwork and application process went smoothly. Clarifying how to qualify the contractor was an issue for one owner, while another owner had to wait more than eight weeks to receive the upgrade incentive.

Clarify Key Pilot Steps and Requirements

Owners identified two specific topics they would like to know more about since related issues arose during the project. CAS was the most frequently identified topic in need of clarification among the owners. Generally, owners understood the importance of CAS but are wary about the different ways it can affect project schedules and budgets. Owners made two specific CAS suggestions:

- CAS testing should be scheduled around the project schedule to minimize impact on it.
- Do not require the PG&E technician and rater to check on the same CAS issue since this took twice the time and delayed the project schedule.

One owner stated that the concept of a building service ID became an important factor in the eligibility for the single-family or multifamily program. Since neither the owner nor the contractor knew this when starting the project, they were caught unaware of how a building service ID affected the single-family or multifamily incentives they were likely to receive and therefore how it affected the project budget.

4.2. Participating Rater Findings

4.2.1. Methods

We interviewed seven raters at five companies representing all seven projects. As summarized in Table 11, raters generally worked on just one project but one company represented three projects. It was difficult to reach and interview some raters despite multiple attempts made by email and phone. Thus, we incorporated financial incentives and coordinated with PG&E to make contact with unresponsive raters. These outreach efforts are also summarized in Table 11.

Table 11. Rater Outreach and Interview Summary

Rater	Project(s)	Interview Status	Outreach Methods Used
1	1, 2, 3	Complete	■ Multiple outreach attempts by email and phone calls
2	4	Complete	■ Multiple outreach attempts by email and phone calls ■ PG&E assisted in contacting ■ Offered $200 incentive
3	5	Complete	■ Multiple outreach attempts by email and phone calls
4	6	Complete	■ Multiple outreach attempts by email and phone calls
5	7	Complete	■ Multiple outreach attempts by email and phone calls ■ PG&E assisted in contacting ■ Offered $100 incentive

An interview guide was prepared for rater interviews. Some questions were skipped due to time constraints or the respondent's unfamiliarity with the topic. When questions were not asked of all 5

raters, we show the number of respondents associated with a finding followed by the number of owners who were asked the question (e.g., 3/4). When all five respondents were asked a question, we provide a single number (e.g., 2) to denote how many raters are associated with that finding.

The pilot raters we interviewed have numerous building industry certifications. Some mentioned HERS II Multifamily (5), BPI Multifamily (4) LEED (3), CEPE (2) and GreenPoint Rater (2). These raters have been in the industry for at least 4 years (2) and as many as 14 (1), and performed between 30 and 100s of multifamily whole-building assessments apiece over the last five years.

4.2.2. Findings

What Worked Well

Raters generally had a positive experience in the pilot (5), often attributing any negative experiences to the pilot status (4). They cited three main areas that worked particularly well:

- **Maintaining existing rater-owner business relationships:** In six of the seven projects, raters stated that they had an existing business relationship with the owners. In four of the seven projects, raters were the first to know about the pilot and recruited property owners.
- **Working with implementation staff:** All raters (5) described one or more positive aspects to working with implementation staff including that the staff:
  - Offered practical flexibility in EE retrofit design approach (2)
  - Were extraordinarily technically supportive (2)
  - Worked within construction timelines (2)
  - Were extraordinarily administratively supportive (1)
  - Were amenable (1)
  - Communicated well (1)
- **Test out and Field Quality Control visit:** All raters stated that implementation staff was clear about what would take place during test-out/ the Field Quality Control) visit (5). Additionally, many raters made passing remarks throughout the interview stating that they enjoyed working with the QA/QC staff in the field since it was often an opportunity for information exchange.

What did not Work Well

- **Communicating with implementation staff:** Raters described varied quality of communication with staff. Nearly all cited communicating with staff via email (4) and phone (3) as communication channels that worked well. However, nearly all (4) also indicated communication issues including:
  - Not receiving return communication quickly enough (3)
  - Implementation staff communicated directly with rater's client, the owner, leaving the rater out of the loop (1)
- **Planning for CAS testing and remediation:** Raters believe CAS is important and critical and noted they found CAS issues on six of seven properties. However, they are concerned that CAS prevents owners from participating because 1) owners do not connect it to energy savings and thus

incentives; and 2) owners may think paying raters for extensive CAS testing on test out is too costly. Raters also noted several issues that surfaced during the pilot:

- CAS testing can be an extensive process for tenants during the verification stage when 100% of affected units require testing. (1)
- Contractors did not understand CAS (2) and one was unwilling to take responsibility for fixing CAS issues.
- PG&E's GSR response to critical CAS issues was problematic (1; see below)

- **PG&E GSR response to CAS issues:** On three projects, PG&E's GSR response to CAS issues was problematic. Raters are required to call in critical CAS issues they find on their projects. However, PG&E response is designed more for single family CAS issues. Remediating critical CAS issues requires PG&E technicians be present at the project site. While a Multifamily CAS issue may represent several units, the GSR process is designed to handle one unit's CAS issue at a time. Therefore, a rater overseeing a CAS issue remediation may need a 30-45 minute phone call with a GSR for each unit impacted by the issue and set up multiple PG&E appointments for each unit.
- **Undocumented or changing pilot procedures and requirements:** While nearly all raters recognized the pilot was in its pilot phase and thus would include some ambiguity at times, they also cited a few areas that could use more definition including multifamily-specific CAS testing, clarifying responsibility and liability for CAS issues, and property admission criteria (see Section 4.2.3 below).
- **Timing:** Some raters found it very difficult to meet pilot timing deadlines especially during the holidays (2).

Paperwork and Applications

Most raters reported no major issues with the pilot's paperwork and application processes (4), while one rater cited a delay of months in the pilot processing the assessment incentive. Although generally raters found the paperwork and application processes acceptable, they made some suggestions for improvement including the incorporation of web portals and bringing clarity to reporting requirements (see 4.2.3 below).

EnergyPro Software

Raters generally find the EnergyPro modeling software a useful tool for completing energy assessments. No raters highlighted the modeling software as an aspect of the pilot that needed improvement or thought that the modeling software should be replaced. Most raters (4) thought the software generally included all key energy components of the buildings. However, three raters described the following limitations in the software as applied to their projects:

- The software does not include exterior lighting such as building mounted lighting, site mounted lighting, or parking lot lighting (3)
- The software does not model interior lighting well (2)
- While the software models in-unit appliances well, it does not model building-level appliances well including refrigerators, dishwashers, washers and dryers, making laundry rooms especially difficult. (2)
- The software does not model water efficiency or how much energy is needed to heat water (1)

Marketing and Outreach

Several themes related to marketing and outreach emerged across the interviews. First, raters tend to have more existing relationships with affordable housing clients than market-rate and therefore lack insight into marketing to this sector. Second, raters' existing marketing and outreach methods are varied and range from very minimal/relying on word of mouth and referrals to more extensive tactics to develop client networks. In addition, one rater would not reveal his marketing and outreach strategies. Finally, all raters highlight the importance of framing energy efficiency assessments and retrofits in business terms for owners. For specific rater suggestions for marketing and outreach see section 4.2.3 below.

Training

Most of the raters (4) attended the pilot-sponsored CAMFEB training; the other rater already had the requisite background. The training combines curricula that prepares raters for both the BPI Multifamily certification exam and the "beta" HERS II Multifamily requirements. An optional fifth day allows raters to receive a GreenPoint Rated MF Existing Buildings certification upon successful exam passage. Rater feedback was positive (4) describing the training as "worthwhile", "dense" and "good".

Three raters also reported receiving informal technical training in the field by implementation staff during the test out and field quality control visit. All found this a positive experience noting that it was conducted in a collegial fashion and increased their technical understanding.

A few raters (3) specified additional training they would like to see included in the pilot including:

- Multifamily blower door training (1)
- CAS protocols (1)
- How to report test-in failure remediation steps when retrofits are declined (1)
- How to model hi-rise buildings (1)
- When to model the property using one model or several models (1)

4.2.3. Rater Suggestions for Improvement

Raters offered several suggestions for improving the pilot, which we list below.

4.2.3.1. Pilot Definition and Clarification

- **Define the pilot as clearly as possible and disseminate information on the full program launch as soon as possible.** Raters report having clients interested in participating in the pilot but not being able to give them an answer as to when they might participate (3). This erodes owner interest in the pilot and makes project planning and budgeting difficult. Additionally, raters find it difficult to invest in a business plan or marketing that incorporates the pilot under this uncertainty.

  Raters noted that the next iteration of the pilot should:

  - Include a multifamily-specific CAS testing tool (1)
  - Clarify raters' CAS testing responsibilities (2)

- Clarify contractor CAS liability (2)
- Clarify how the implementation team decides to admit one property and not another (1)

4.2.3.2. Ease of Use

- **Create program website with participant-specific pages and portals (3):** Three raters suggested that the program create a website which includes directions tailored to owners, raters, and contractors. Navigating to pages specific to them, these three participant types could then quickly glean information that was relevant to them and download/upload applications, agreements, reports, etc. In addition, the entry fields in the portal might populate data fields across applications such that one rater thought a portal could help decrease redundancy stemming from multiple forms asking for the same information.
- **Refine reporting requirements and provide examples (2):** One rater stated that the current HERCC report template, which the pilot uses, has ambiguous instructions and should be reviewed for clarity. Another rater stated that having a sample report would go a long way in helping the pilot standardize the reports across projects.
- **Host rater forums or conference calls to collect rater feedback (3):** Three raters suggested that the pilot provide opportunities to gain rater perspective and feedback. Notably, in two cases this suggestion was in response to being asked how raters would like pilot support in meeting project timelines and meeting pilot requirements.
- **Webinar improvements (2):** Two raters suggested that the webinar include more time for questions and discussion. One rater suggested that the webinar be reorganized to separate pilot and technical information while providing more diagrams to illustrate pilot participation and processes.

4.2.3.3. Pilot Design

- **Add experience as a rater requirement (2):** One rater noted that experience in the field could be very different from what is taught during trainings (e.g., CAMFEB). As such, raters need field experience before becoming competent program raters. The rater believes requiring field experience can help avoid major rater mistakes, maintaining the reputation of the pilot and the industry. Another rater also suggested that the pilot require some level of experience to attend the training since, for one of his staff, the training was too complex to be able to comprehend the material the first time through.
- **Use a closed rater/consultant model (1):** One rater suggested that the pilot select two or three firms to be the sole raters for the pilot. The rater provided several reasons. First, the raters would be extensions of the pilot and, therefore, the owner would not have to vet raters. Second, if there are only a few firms then each has sufficient work to invest in marketing. Finally, pilot reports can be easily standardized across a small number of raters.

4.2.3.4. Incentives

- **Increase/Modify the assessment incentive (2):** Raters believe that increasing the assessment incentive would help cover the cost of the extensive CAS testing (2). In addition, if the assessment

incentive for market-rate properties were increased to affordable housing assessment incentive levels, one rater believes market-rate interest in the pilot would increase. Finally, one rater would like to receive some of the assessment incentive directly before and after the project is completed to ensure timely payment for their services.

- **Increase/Modify the upgrade incentive (3):** Some raters believe the upgrade incentives should be more aligned with those available through the single-family program. (2) One rater notes raters perform the same amount of work per unit regardless if the multifamily qualifies for the single family or the multifamily program. Therefore, the rater cost to develop and manage the project represents a larger portion of the multifamily incentive than it does the single-family incentive. Another rater notes that in cases where a property has buildings that would qualify for both the single-family and the multifamily program, having two different upgrade incentive levels produces confusion for the owner and decreases the likelihood that they will participate.
- **Make incentives available to contractors (2):** Two raters made suggestions that would allow contractors to collect incentives. One rater suggested that the contractor be provided an incentive at successful project completion given the contractor 1) is required to enroll in the pilot; 2) must absorb increased liability; and 3) must help remediate CAS issues. The rater notes that an incentive might increase contractor buy-in and encourage them to market the pilot. Similarly, another rater suggested that the pilot offer a finder's fee or reward to the contractor or rater who recruits a property into the pilot.

4.2.3.5. Marketing and Outreach

Raters suggested a variety of ways the pilot could increase marketing and outreach. We divide these up into what might work generally and then what might work specifically in the affordable housing and market-rate sector.

- In general, raters suggested:
  - The pilot use case studies to illustrate past project successes and highlight the incentive earned (2)
  - Raters should provide owners with ballpark estimates of what their incentives may be even before they complete an assessment by touring the property and examining the condition of a few buildings and units. This helps owners understand whether they should consider participation (1)
  - Raters should build relationships over time and look for deeper energy savings upgrades on future projects once a project has been completed successfully and trust has developed (1)
  - That raters be called "energy consultants" since this is more descriptive of the services they actually provide (1)
  - (as noted above) The pilot should make incentives available to contractors to encourage them to recruit properties. (2)
- For the affordable housing sector, raters suggested:

- Raters or program staff should attend the CA Affordable Housing meeting. They should bring case studies and a knowledgeable business-savvy person to talk to the bank representatives and other business types. (1)
- The pilot should coordinate with CTCAC since many affordable housing owners make use of these tax credits. (1)
- Messaging be used that highlights owners can claim rebates for what they are likely already planning. (1) *Note that the evaluation team does not recommend this approach since it would be promoting free-ridership in a program.*

- For the market-rate sector, raters suggested:
  - (As noted above) Increasing the assessment incentive for market-rate properties to make the pilot more attractive (1)
  - The pilot and raters focus outreach during times of property acquisition when there will likely be extensive renovations taking place (1)
  - The pilot use PG&E's existing customer database to locate market-rate properties and then the pilot or raters can outreach to these owners directly. (1)

4.2.3.6. Working with Tenants

Rater experience working with or around tenants ranged from a relatively smooth experience to a cause of a little friction. Raters made the following suggestions for making the experience easier for tenants:

- Have managers take the lead on informing and managing tenant expectations throughout the project since managers already have relationships and the most experience working with tenants (1)
- Emphasize that the test outs are completed with tenant health and safety in mind (1)
- Avoid holidays as these are generally inconvenient times for tenants (1)

4.2.3.7. PG&E GSR Response

- **Modify PG&E GSR response to increase efficiency:** One rater had several suggestions for modifying PG&E GSR response:
  - Develop a multifamily-specific GSR response model. The current response model is based on the single-family home. For example, GSR staff ask about the "homeowner".
  - Allow a PG&E GSR technician to be placed on standby when the rater is scheduled to do CAS testing. When there is a large number of units, it is likely that there will be at least one CAS issue requiring the technician. Since raters know the number of units they will test and when they will test, they can inform PG&E of their plan ahead of time.
  - Allow information about CAS issues to be submitted electronically alongside telephone calls. GSR phone staff are trained to complete a call in two minutes which may not be sufficient time to collect all the information. Email could provide this information.

- Allow raters to leave voicemail for the GSR staff. To report one CAS issue, raters must spend between 10 and 45 minutes on hold. This affects testing and project scheduling. If raters could leave voicemail for GSR staff, the GSR staff could call the rater when staff were available, allowing the rater to continue working in the interim.

4.3. Participating Contractor Findings

4.3.1. Methodology

We interviewed five contractors representing five projects. As summarized in Table 12, contractors generally worked on just one project, but one contractor worked on two projects and another two worked on the same project. It was especially difficult to reach one contractor and to complete an interview with another despite multiple attempts made by email and phone. Thus, we incorporated financial incentives and coordinated with PG&E to make contact with unresponsive contractors. These outreach efforts are also summarized in Table 12.

Table 12. Contractor Outreach and Interview Summary

Contractor	Project(s)	Interview Status	Outreach Methods Used
1	1	Complete	■ Multiple outreach attempts by email and phone calls
2	2	Complete	■ Multiple outreach attempts by email and phone calls
3	2	Complete	■ Multiple outreach attempts by email and phone calls ■ Offered $100 incentive
4	3, 4	Complete	■ Multiple outreach attempts by email and phone calls
5	5	Complete	■ Multiple outreach attempts by email and phone calls
6	6	Could not complete	■ Multiple outreach attempts by email and phone calls ■ PG&E assisted in contacting ■ Offered $200 incentive
7	7	Could not complete	■ Multiple outreach attempts by email and phone calls ■ (Implementation team confirmed that contractor does not have any current contact information)

An interview guide was prepared for contractor interviews. Some questions were skipped due to time constraints or the respondent's unfamiliarity with the topic. When questions were not asked of all 5 contractors, we show the number of respondents associated with a finding followed by the number of owners who were asked the question (e.g., 3/4). When all five respondents were asked a question, we provide a single number (e.g., 2) to denote how many raters are associated with that finding.

4.3.2. Findings

What Worked Well

Contractors generally had a positive pilot experience and described five main areas that worked particularly well:

- **Participation process (5):** All contractors stated that participating in the pilot was overall a smooth process.
- **Natural enrollment:** All contractors (5) became pilot participants because the owners wanted to participate in the pilot. As such, the contractors' enrollment into the pilot was aligned with the project work they were already planning or were doing for their client.
- **Growth of a multifamily energy efficiency (EE) retrofit project network:** The project teams tend to be created by the owners, but one contractor noted that he has worked with the same rater on other projects. In addition, on three of the five projects, the contractors and owners had worked together on a prior project. These interrelationships may indicate the development of a project network with deeper knowledge of EE and CAS in the multifamily sector.
- **Safe Projects:** Among the five contractors interviewed, only one stated that there was a CAS issue with a project. However, program records and correspondence with program staff indicate that CAS issues were present on four of the five projects on which these contractors worked.

  These omissions may reflect the minor role contractors have in identifying CAS issues and coordinating solutions. It is also possible that contractors were involved in the remediation of the issues but did not identify them as CAS issues. For example, when we asked one contractor about any CAS issues on the project, the contractor replied that on another project he saw a facilities staff smashing compact fluorescent bulbs. This indicates that this contractor was unclear about CAS generally.
- **Implementation Staff Support:** Nearly all contractors (4) found implementation staff very supportive, while one contractor did not recall any interaction with the implementer. Comments generally indicated implementation staff were informative (3) and solution-oriented (1), while one contractor stated their technical and management support was critical to project success. However, this level of support may not be scalable during a full program launch.

What did not Work Well

Contractors generally had a positive pilot experience but described four main areas that did not work well:

- **Contractor compliance and agreement forms:** Most contractors (3) found the contractor forms difficult to sign for liability, privacy, and cost reasons.
  - One contractor noted that the liability was "oppressive" and "very one-sided" toward PG&E. The liability for failing to comply with social security traces and background checks including sub-contractors was not worth the liability risk when there was no direct profit from pilot incentives for the contractor.
  - Another contractor stated that the employees and sub-contractors "balked" at the background checks because "they are very protective of their privacy". It was "overkill" because the contractor did not see what a "DUI that I got last year has to do with me performing my work in construction."

- Another contractor noted that criminal background checks seemed unnecessary since the contractor already performs them. Having to get new clearance cost a lot of money since it had to be done for each or 190 employees.

- **Contractor use of the webinar:** Across the interviews, some contractors gave feedback indicating that they required additional support or interaction beyond the webinar to understand what would take place during the pilot (3). Additionally, they suggested that the support should probably consist of an in-person or phone conversation with someone knowledgeable about the pilot. One contractor asked questions of the implementation team after watching the webinar. In another case, the contractor was provided a link to the webinar but never watched it and instead was coached by implementation staff in the field. In another case, a contractor stated that the webinar was dry and lacked interaction.
- **Issues with tenants (1):** In four of the five projects, there were tenants in the units during the retrofit. While all retrofit work generally inconveniences tenants, one contractor described particularly "challenging" conditions for one project. In this case, issues with project rescheduling meant tenants were sent a notice multiple times. This created stress for households with babies, seniors, or those with occupants who typically sleep during the day.
- **Lack of communication on the project team (1):** One contractor stated that there was not much communication or leadership within the project team such that:
  - The contractor never saw the Scope of Work, and
  - The contractor had not been informed that the pilot deadline would end before the project deadline meaning the contractor had to rush to install several appliances

Marketing and Outreach

Contractors heard about the project through varied channels including the owner (2), implementation staff (1), word of mouth (1), and by working on the project (1). Contractors' own marketing and outreach approach for multifamily projects was also varied: referrals (4), cold calls, Builders' Exchange[22] and general networking (1).

Contractor Suggestions

- **Modify contractor compliance and agreement forms (3):** Consistent with contractors' comments noted above, contractors believe that the forms should drop the liability clause and background checks.
- **Hold a project team meeting at the beginning of the project (1):** One contractor made this suggestion believing that such a meeting would have prevented the communication problems that occurred throughout the project.

Contractors made the following suggestions for outreach to other contractors:

- Market to local chapters (i.e., Marin, Contra Costa) of Northern California Builders Exchange

22 Builders' exchanges are builder industry associations based locally or regionally. They may provide training, business development, insurance and advocacy for their members.

- Host a booth at the annual Purchasing Contractors Building Convention (PCBC) on June 25th and 26th at Moscone center.
- Advertise at hardware stores (e.g., Home Depot, Lowes) where contractors, even large ones, go to shop for items (e.g., hand tools) when they are in immediate need on the project.
- Focus on the owners since they are the decision-makers. Then, to be hired by the owners, contractors will learn about the pilot and become qualified for it.

Contractors made the following suggestions for marketing to owners

- Use the following messaging: participating in the pilot will make their properties more appealing to possible renters, and that they will gain efficient windows and appliances to reduce utility bills (1)
- Use the following messaging: participating in the pilot will help existing projects get better insulation and appliances (1)
- Use the following messaging: participating in the pilot allows you to go green and become consistent with others who are saving energy and water throughout the state (1)
- If contractors received some portion of the rebate without increased liability, they would be more likely to promote the pilot to owners (1)
- Offer contractor incentives (e.g., a "finder's fee") to encourage marketing and outreach. Depending on property size (e.g., fewer than 50 units or 50 or more units), contractors might receive $500 or $1,000. (1)
- Highlight pilot and CTCAC alignment in their focus on energy efficiency, thereby increasing property tax credit qualifications. (1)

For marketing to market-rate owners in particular, contractors made the following suggestions:

- (as noted above) Encourage contractors to market the pilot through a finder's fee (1)
- Advertise through utility bill inserts (1)
- Leverage renter interest in how green their property is to pressure owners to take energy efficiency and other green actions (1)
- Highlight incentives (1)

For supporting participating contractors' marketing and outreach efforts, one contractor suggested that the pilot list all pilot-approved contractors.

For reducing or ameliorating tenant inconvenience, one contractor observed that the owners gave tenants movie passes to use during the time the project team would be inside the unit. Another suggested that owners host presentations on the pilot in the community rooms.

For additional training, one contractor was Interested in both general technical and sales training.

4.4. Non-Participant Property Owner Findings

The following section presents findings from interviews conducted in January and February 2014 with non-participant and dropout owners and managers.

4.4.1. Method

In order to gain insight into owner decision-making and to identify potential barriers to participation, we conducted telephone interviews with property owners and managers who dropped out of the pilot or otherwise decided not to participate. We recruited participants through a sample of pilot dropouts and non-participants provided by Build It Green, and we offered a $100 incentive to complete the 45-minute long interview.

Property managers designated as "Dropped out of pilot" in pilot records were those who had been offered enrollment into the pilot, who had indicated intent to fully participate by executing the customer participation agreement, and for whom a space in the pilot was reserved. Dropouts may have completed an assessment through the program. Those designated as a "non-participant" had spoken with the implementer and expressed interest, but never indicated that they were going to participate. As shown in Table 13, there were fifteen affordable housing and six market-rate owners in our sample, of which we interviewed three and two respectively. Two affordable housing respondents were dropouts, while one was a non-participant. Both market-rate owners were dropouts.[23]

Table 13. In Depth Interview Disposition by Housing Type

Disposition	Housing Type		Total
	Affordable Housing	Market-Rate	
*Completes**	*3*	*2*	*5*
Never available	9	2	11
Refusal	0	1	1
Not-qualified	3	1	4
Total	**15**	**6**	**21**

Additionally, PG&E introduced us to a representative of a large national market-rate management firm that owns an estimated 50 properties in PG&E service territory, including more than 550 buildings and over 12,000 units. Because this interview respondent is so different than the others, we present findings from this interview separately.

Compared to other sections in this report, we wrote Section 4.4 in a more qualitative manner to provide context and summarize themes emerging from the interviews. This approach stems from multiple aspects of the non-participant sample. First, we were only able to interview six non-participants who had widely differing levels of engagement in the program, i.e., some had not participated at all and others had completed assessments through the program. Second, the non-participants came from different multifamily backgrounds encompassing different organizations and building types and different numbers of properties. As a result of these differences, not all questions were applicable to all respondents and therefore responses were not tabulated across that sample. Instead, we focus on emergent themes and contextualize individual findings.

23 Throughout Section 4.4, we refer to both non-participants and dropouts as "non-participants" unless otherwise specified.

4.4.2. Non-Participant Findings

A number of themes emerged from the non-participant property manager in-depth interviews.

- Most respondents planned to include energy efficiency improvements as part of a larger retrofit project. This reduces administrative costs, eases financing constraints, and reduces the overall burden on property occupants.
- The primary drivers of participation for both market-rate and affordable housing properties are the rebates and ease of use. The primary driver for market-rate properties is a return on investment within three or five years.
- A significant portion of affordable housing is managed by non-profits that are primarily concerned with tax credit syndication every 15 years. The pilot must accommodate this process to attract participation from this sector.
- Time constraints were the most common barrier to participation in the 2013 pilot program. Property managers must complete many stages of approval before project participation, and some cited a year or more as an appropriate amount of time to complete projects like these.
- Financing is difficult for all property types, though for varying reasons. On-bill financing would avoid common barriers to additional financing.

4.4.2.1. Respondent Characteristics

Both market-rate and affordable properties displayed a mix of billing arrangements, from master-metered buildings to buildings in which tenants pay for both gas and electric. In most cases, there was variation in billing policies even among properties owned by the same respondent.

The type of company that manages the property differed between affordable and market-rate housing. Companies who managed affordable housing were either non-profit organizations or public agencies. In most cases, the company that managed the affordable housing units was not the same as the company that owned the property. These management companies monitor and maintain properties for owners who have usually purchased the property in part to take advantage of tax credits. Generally, for-profit partnerships managed market-rate properties.

The construction date of the buildings ranged from 1972 to 2001.

The state of energy efficiency at all buildings was relatively low. None of the buildings had significant energy efficiency work done within the last 5 years. Neither market-rate nor affordable properties had made significant structural or common area changes. However, market-rate properties did have more up-to-date amenities (i.e. appliances, indoor lighting, etc.) Energy efficiency improvements generally do not allow rent increases or contribute to keeping market-rate units competitive, and so are not prioritized.

Most respondents noted that they would not complete an energy efficiency retrofit on its own, but had planned to include energy efficiency improvements within the context of a larger retrofit. This approach minimizes impact on residents, eases financing restrictions, and reduces administrative costs.

4.4.2.2. Pilot Satisfaction

Satisfaction is high for both implementation team professionalism (i.e. responsiveness, follow-up, and answering questions) and for information provided by the program (i.e. how valuable, informative, clear and relevant the information was). All respondents (5) rated responsiveness as a 9 or 10 on a 10-point satisfaction scale.

Most respondents (3 of 5) rated the information provided by the program as an 8 or higher, but in two cases respondents were not satisfied. In each case, the dissatisfaction was connected to the energy rater, not the program itself. One respondent rated the information provided by the program as a 5. This respondent's energy rater, while quick and inexpensive, did not put the results of the rating into context and so the respondent was unsure of how to proceed. Another respondent declined to give a rating for the information provided by the program, due to the complexity of her complaint. She disagreed with the results of the rating and did not believe that the information was accurate.

4.4.2.3. Marketing & Awareness

Each respondent was able to recall the specific person or company that brought the pilot program to his or her attention. These channels included the California Housing Partnership, Siemen's Industries, and Stopwaste.org. The exposure came in the form of personal communication such as an email, phone call, or conversation at a conference.

When asked about effective ways to disseminate program information in the future, respondents repeatedly gave two suggestions. The first suggestion, which applies only to affordable housing, is to collaborate with the California Tax Credit Allocation Committee (CTCAC). Each affordable housing project that participated in the program did so in conjunction with a retrofit project that was eligible for tax credits. Efficiency improvements give property managers an advantage when applying for competitive tax credits. When property owners or managers apply for tax credits, they do so through the CTCAC. If the program were to collaborate with the CTCAC, it could reach a large percentage of affordable housing property managers.

The second suggestion was to work with the various real estate and housing partnerships. Examples cited by respondents include the California Housing Partnership (CHP), the Non-Profit Housing association (NPH), the California Apartment Association (CAA), the National Apartment Association (not affiliated with the California Apartment Association), and the Apartment Owners Association (AOA – northern California branch).

Both affordable housing and market-rate properties are primarily attracted to rebates, and secondarily by the ease of performing energy efficiency improvements through the program. The attractiveness of financing is limited, since it is difficult for both property types to secure additional financing of any kind. On-bill financing is attractive to all, in that it avoids common issues that can prevent financing of improvement projects like these.

Reducing the cost of an energy assessment is a key factor in encouraging participation from market-rate properties. Without this incentive, the property owner must pay a significant amount of money to determine if they would qualify. This is an unattractive risk.

On the other hand, free or heavily subsidized audits are not as critical for non-profit organizations as they are market-rate properties. Since tax credit re-syndication often requires an energy audit, this is usually part of a project budget from the beginning. Financing offers would not be attractive unless they offered an unconventional structure such as on-bill financing. Financing considerations for market-rate properties are described in more detail in section 4.4.2.6.2.

Calling attention to the increased value of the property is not an effective message for market-rate property owners. Energy efficiency improvements generally do not allow properties to charge higher rent. The only improvement on property value would be a reduction in operating costs, which is not a primary consideration when valuing property.

The fact that the program helps to upgrade units to modern energy systems is also not a strong message, since market-rate units must keep up-to-date anyway in order to remain competitive in the rental market.

One market-rate respondent said that the fact that the program helped to upgrade a number of measure types all at once was a benefit. Rather than being concerned about increased hassle due to the size of the project, the respondent appreciated that certain measures could all be replaced at once and so reduce operating costs and the rate of replace-when-broken maintenance across the board.

4.4.2.4. Decision Making

The market-rate and affordable housing non-participants we interviewed stated that a small number of people within each organization make the decision to participate. However, the criteria used differs across organizations. As mentioned above, most respondents would not consider an energy upgrade project in and of itself, but rather include energy upgrades along with a larger retrofit project.

The affordable housing sector often looks for rebates and incentives to stretch limited budgets. The primary limiting factors to participation are administrative cost and time. If neither of these is too burdensome, a non-profit company that manages an affordable housing property will generally apply for participation when re-syndicating tax credits on a 15-year cycle. Public agencies are not as concerned with administrative costs, but are more cognizant of how the program will fit within the needs of their portfolio at large. They would prefer to engage in improvements at many properties at once to leverage an economy of scale.

Return on investment is key for market-rate properties. As a general rule of thumb, a payback period of three years and under is very attractive, a payback period of under 5 years will be considered, and a period of over 5 years is undesirable.

Reduced hassle is also an incentive. The ability to upgrade a certain measure type across the facility all at once reduces administrative time an operating costs incurred when replacing aging measures on an as-needed basis.

4.4.2.5. Tax Credits

Tax credits are a primary driver of participation for non-profit managers of affordable housing. To increase the likelihood of participation among those managing affordable housing, the program should

consider these tax credit requirements and work to integrate incentives, eligible measures, and funding schedules with existing tax credit structures.

Tax credits run on a 15-year cycle, after which there is often an ownership turnover to facilitate tax credit re-syndication. In order for the owner to take advantage of tax credits, the building must be at least 10% more efficient than existing conditions. This motivates the management company to take advantage of any program offering efficiency rebates. Building owners and managers often delay non-critical renovations until this 15-year turnover, since there is little pressure to update facilities to compete for tenants.

Competitive tax credits offer a higher level of compensation than non-competitive credits. Energy efficiency measures are included in the list of renovations that the CTCAC uses to compare applicants. The extent to which the program overlaps with this point system serves as an additional motivation for participation, since it allows non-profits to leverage their limited capital to create a more competitive application.

Note that affordable housing managed by public agencies does not chase tax credits in this way. Public agencies are mission driven organizations that have more flexibility in available capital, and a funding source that does not heavily depend on tax credits.

Financing is critical for renovation projects. Each type of organization interviewed described a different approach to financing.

4.4.2.5.1. Affordable Housing – Non-Profit Financing

The two non-profit affordable housing managers we interviewed stated that financing is very difficult for a variety of reasons. Tax-credit re-syndication locks in financing for 15 years. Any change in this financing plan would require a high level of organizational approval from the owner or limited partner. This partner could be a single entity, but is more often a group or even a fund in which many organizations are stakeholders. Gaining approval to change the funding structure from each stakeholder would be a very difficult process. Non-profit property managers in this position generally do not attempt this as a matter of course.

In addition, if there are other loans already involving the property, these lenders need to approve any additional financing. Additional loans from third parties present additional risk; lenders do not want those to whom they have lent to be forced to choose which debt to repay should funds become limited. For this reason, non-profit management agencies are reluctant to seek additional financing, and perceive traditional lenders as hostile to this type of arrangement.

On-bill financing could avoid these barriers, as it would likely not require approval from the ownership partners, and would not depend on lenders who would be hesitant to allow an additional stakeholder.

4.4.2.5.2. Affordable Housing – Public Agencies Financing

The affordable housing public agency we interviewed stated that public agencies do not receive tax credits, and so do not adhere to a 15-year improvement schedule. Instead, these agencies manage a portfolio of properties, so they schedule improvements when they determine that they can achieve an economy of scale.

The public agency we interviewed reported a preference to work with a single, local bank when financing improvement projects. They seldom undertake efficiency improvements in and of themselves; rather they make energy efficiency improvements in conjunction with other retrofit projects in order to minimize occupant impact and to save administration costs. The fiscal year for this organization begins in April and ends in March. The beginning of this fiscal year would be the best time to initiate improvement projects.

This public agency also stated that on-bill financing is an attractive option.

4.4.2.5.3. Market-Rate – For-profit Financing

The two market-rate property owners we interviewed described a few specific funding scenarios. Each of these are viable financing strategies for market-rate properties that a successful whole-building program should consider in order to attract market-rate program participants.

The most common scenario involves a property that the owner has already leveraged for previous general improvements. These improvements are not focused on energy efficiency and are instead motivated by the ability for the owner to be able to increase the rent. However, the improvements may unintentionally increase the efficiency of the building too (e.g., new windows that happen to be more efficient than the ones they replaced). While a construction loan allows a quick source of capital for these improvements, it also has a variable floating rate that represents extra risk. After the work has been completed, the property owner can make the case to a bank that the property is able to generate a higher level of income and in so doing secure a general loan with a fixed rate. The owner uses this new loan to pay off the construction loan, resulting in higher rents and a low-risk fixed loan payment. This is a typical process for market-rate properties, and results in a long term bank loan which makes additional financing difficult, since lenders are reluctant to allow additional stakeholders on a property that has already been leveraged unless the purpose is to increase rents and repeat this cycle.

This situation is true even for newly acquired properties. When the company purchases the property, it secures two floating rate short-term loans; one to purchase the property, and another construction loan for any needed retrofits. After this work has been completed, another long-term fixed rate loan is secured to pay off the first two loans. This results in a situation similar to the first, in that the owner would find it difficult to secure financing unless the construction allows a rent increase.

A third scenario occurs frequently for minor renovations, and is the most likely scenario in which energy efficiency improvements can take place. If a building has been owned long enough to require maintenance, but is not due for a retrofit that would allow rents to be raised, improvements are made with available capital. Since these improvements do not allow increased income, there is no motivation to incur increased debt, so improvements are limited to budgeted liquid capital. Energy efficiency improvements do not allow increased rent, and so are generally undertaken using this strategy.

A fourth scenario is in some ways similar to on-bill financing. A property in good standing can open a limited line of credit with a bank. After the owner uses this line of credit for efficiency improvements, or other improvements that lower operating costs, the owner then budgets the expected reduction in operating costs to repay the credit line.

On-bill financing is an attractive option to the two market-rate owners we interviewed. Efficiency improvements do not allow rents to be raised, which makes it difficult for owners to secure financing

specifically for these improvements. On-bill financing would avoid the necessity for additional financing and result in reduced operating costs.

4.4.2.6. Role of Energy Rater

Based on findings from the five non-participant interviews, the typical relationship with energy raters differs between properties that are affordable housing and those that are market-rate.

4.4.2.6.1. Affordable Housing

An energy rater is necessary to determine a scope of work that will allow affordable housing properties to qualify for tax credits. As a result, these companies often have an existing relationship with one or more energy raters. Among interview respondents, some had relationships with energy raters who were already qualified to participate in the program, and others had raters who had to register with the program during the participation process. Speaking about a fully participating project, one affordable housing non-profit dropout stated that had their usual energy rater not qualified for the program, they would likely not have participated in it. In that case, the management company would have been hesitant to find a new rater specifically for program participation, since they already have a good relationship with the existing rater who has worked on many projects for the company. Ensuring a fast and easy process for energy raters to register with the program would be beneficial for this reason.

4.4.2.6.2. Market-Rate

In contrast to affordable housing owners, market-rate owners generally do not have existing relationships with energy raters since they do not have energy efficiency requirements dictated by tax credits or other outside incentives. Instead, appliances and amenities within units are often updated to new and efficient units as a matter of course so that the units can stay competitive in the rental market. Interviews with non-participant owners indicated some friction between market-rate owners and the energy raters with whom they were exploring program participation. Affordable housing owners and the raters who serve them understand the energy audit process that supports CTCAC tax credit qualification. Yet, based on a limited number of interviews, we found that market-rate owners and their energy raters may not understand the program or how to leverage the assessment incentive well enough to ensure a smooth participation experience for market-rate owners. Each of the two market-rate owners was dissatisfied with one energy rater with whom he worked.

In the first case, the property owner used two different raters for two different properties to complete assessments through the program before dropping out for lack of financing. The cost of the audit by the Build It Green recommended rater was high even after the program's assessment incentive. As a result, for the second property, the owner secured the services of a smaller, local rater whose fees were covered by the program's assessment incentive. However, the owner's satisfaction with these two raters differed significantly; both provided actionable energy audit data, but the smaller rater operation did not offer interpretation of the data. As such, without guidance from Build It Green, the participant would not have been able to make good use of the data for the second property. If the assessment incentive had been larger, the market-rate owner would have likely used the recommended rater a second time and the implementer would not have needed to become involved.

The second case illustrates again the 'growing pains' of market-rate property owners and energy raters embarking on new working relationships. It also illustrates the advantage of using energy modeling with testing (i.e., with blower door) to determine rebates, rather than energy modeling without blower door testing. Since the building qualified for the EUC Home Upgrade single-family program, this multifamily owner ultimately participated in the single-family program. However, the single-family program requires a test-in and test-out blower door test and uses the results to determine the rebate. This respondent felt that the test-out results were suspicious; some units tested-out worse, not better for energy savings. The dimensions of some units were listed incorrectly. As a result, says the respondent, the rebates were much less than expected. This respondent was very dissatisfied and has warned her colleagues against future participation. This situation underscores the implementation advantage of determining rebates using modeling rather than test-in and test-out. The inability to predict rebate amounts introduces additional risk that can be a barrier to participation.

4.4.2.7. Combustion Safety

Combustion safety is an issue that applies to both property types. One market-rate dropout said that the rater found 17 different CAS issues that needed addressing. PG&E offered to repair these issues, but required 17 different appointments on 17 different days. These issues were all in one property, and many were in adjacent units. The property manager ultimately fixed the issues himself and absorbed the cost, instead of continuing to address the issues in collaboration with PG&E.

4.4.2.8. Market Barriers to Participation

Though the specifics differ across affordable housing and market-rate properties, non-participants from each type described similar possible barriers to participation. Notably, although all cited barriers to participation, respondents also were eager to participate in 2014.

Based on findings from the five non-participant interviews, the primary reason for non-participation or dropping out of the 2013 pilot program was a lack of time. Respondents described the process of finding an energy rater, getting a scope of work, gaining approval for budget changes and/or financing, managing scheduling and impact on residents, and finally the work itself. These stages take time, and the time available to participate in the pilot program was not sufficient to complete all of these steps. This time constraint is exacerbated by requirements that must be met before participation can begin. For affordable housing, participation is contingent upon approval of tax credits, the results of which may not be known until many months into their business cycle. Both affordable housing and market-rate participants must secure a scope of work before they can move forward and approve budgets and financing. These factors have led interview respondents to suggest a timeline of a year or more to ensure enough time for participation.

For non-profit organizations, who manage a significant portion of affordable housing properties, the program incentives may not outweigh administrative costs. In general, non-profit management organizations do not own the buildings they manage. Rebate money cannot be used to reimburse the management company for additional administrative costs, but rather must go to the organization that owns the property. The result is that these rebates are attractive only if they make the difference between a project moving forward or not. For example, one respondent noted that they could have had almost half a million dollars' worth of incentives from the program, but that the company management

decided not to participate because the extra administrative costs were not within the operating budget of the non-profit.

One respondent noted that the Bay Area Regional Energy Network (BayREN) offers some assistance with energy efficiency measures, developing a scope of work, and testing. Though the incentives are not as high, the administrative burden is lower, and so this option competes with the PG&E multifamily program as a way to lower retrofit costs.

In more than one case, a company did not move forward in part because of the background check requirements. In these cases, the company had already begun their retrofit projects and hired contractors. It was not feasible to retroactively require contractors who had already begun work to comply. However, these respondents did indicate that they did not believe this would have been a significant issue if they had been able to notify their contractors at the beginning of the project.

Some participants have an existing relationship with one or more energy raters. Since these raters are trusted and are often engaged in multiple projects, a significant barrier would arise if these raters were not able to qualify for participation in the program. In each case, this was possible and so did not deter the participant from receiving an assessment. However, this was cited as a potential problem going forward.

4.4.3. Large Market-Rate Owner Findings

Per PG&E's suggestion, we interviewed a sustainability representative at a large, national market-rate management firm which oversees more than 550 properties and 12,000 units in PG&E service territory. Property configurations varied and included high-rises, mid-rises, and garden-style buildings. The representative estimated that there are at least two or three other such large companies operating in PG&E territory. PG&E personnel and the representative communicate regularly to discuss ways to participate in PG&E programs.

Reasons for Non-Participation

To date, the firm has participated in prescriptive multifamily programs, generally for in-unit appliances. The rep was unclear as to the exact reasons the firm has not yet participated in the pilot program but indicated the following potential barriers:

- **Property size:** The properties on average consist of at least 200 units.
- **Split incentive:** Reducing operating costs is the primary motivation for the firm to make energy upgrades to common areas. Since tenants pay their own utility bills, the firm does not have strong enough motivation to complete upgrades that primarily benefit the units.
- **Property already underwent most attractive upgrades:** While in-unit appliance upgrades increase the cosmetic attractiveness of the units, these are not a driver to participate in the pilot because the firm has generally already upgraded appliances through prescriptive programs or during unit turnover.

If the company is to participate in the future, it may do so at only a few properties, perhaps fewer than ten, based on the recommendations of an in-house modeling study currently underway.

Energy Efficiency Priorities

The company's prioritizes energy efficiency improvements to common areas over in-unit areas due to the split-incentive barrier. For the company's properties located in California, they are generally interested in solar, solar hot-water and common area lighting improvements (i.e., LED in parking garages and hallways). The company has internal analytical staff to make these decisions based on an ROI criterion of about two years.

The company hired a consulting architect who is trained in whole-building audits and EnergyPro modeling software to complete audits of the properties likely most in need of rehab, which generally occurs every seven to ten years. In particular, the firm is looking to undertake projects in which common area energy retrofits will decrease operating costs. Per the audit conclusions, the company might submit a few properties to the EUC MF program. However, the ROI criterion and the relatively mild climates in the San Francisco Bay area in particular, make non-common area, building envelope upgrades unlikely and therefore participation in the program unlikely.

Budgets and Finances

The company budgets for the following year and does not use financing to make improvements or upgrades. It is not interested in a utility on-bill financing product as it is not consistent with its current budgetary practices and would likely cause confusion among the accountants.

Possible Points of Leverage

Overall, this company did not seem a likely candidate for the program, but two potential points of leverage did surface in the interview.

- **Increase per-unit incentives:** The representative indicated that increasing the per-unit incentives would increase the likelihood of participation. Across a range of programs (not specific to PG&E), the representative generally finds that single family per-home incentives are higher than multifamily per-unit incentives and therefore more attractive. However, as the representative explained, the measure incentives would have to cover a substantial portion of in-unit upgrades:

  > *We pretty much want in-unit upgrades to be free, because for us those costs are tenants' costs. It would be great to reduce them but, bottom line, it's not our cost.*

- **Highlight potential for LEED certification and cosmetic improvement:** Only two possible drivers for non-common area upgrades surfaced in the interview: increasing unit attractiveness and LEED certification. Both are used by the firm to attract tenants. If the program can show that participation helps to address these needs, it may be able to recruit some market-rate properties into the program that are otherwise resistant to in-unit energy upgrades.

4.5. Non-Participant Rater Findings

4.5.1. Method

There were 45 unique energy raters who attended the pilot's CAMFEB training or the program webinar but did not participate in the pilot. The evaluation team called these non-participating raters in an attempt interview as many as possible between late January and early February 2014. We offered them a $100 incentive for the interview. We completed interviews with 12 of these non-participating raters. While 12 interviews out of 45 possible sample points is good in terms of representation we still note

that it was challenging to reach non-participating raters by phone (e.g., many did not answer multiple attempted calls across several weeks and did not have voicemail machines; several refused or ignored voicemails asking for an interview even though we were offering $100 for about 15 minutes of their time; etc.). The difficulty in reaching non-participating raters may be indicative of how difficult it will be to get more raters to support this program.

Table 14. Non-Participating Rater Interview Dispositions

Disposition	Counts
Completed Interviews	12
No Answer/No Voicemail	18
Left Voicemail	8
Refused	6
Contact No Longer Available	1
Total	**45**

The goal of these interviews was to explore the raters' feedback on the program and what the program might need to improve to get more market-rate properties to participate.

An interview guide was prepared for the rater interviews. Some questions were skipped due to time constraints or the respondent's unfamiliarity with the topic. When questions were not asked of all 12 raters, we show the number of respondents associated with a finding followed by the number of raters who were asked the question (e.g., 3/4). When all twelve respondents were asked a question, we provide a single number (e.g., 2) to denote how many raters are associated with that finding.

4.5.2. Findings

Training Summary

These raters indicated they attended the CAMFEB training to expand their knowledge or qualifications of better building practices because it was convenient, affordable[24], and relevant to their target market at the time; not because they were interested in participating in the pilot as a rater. This is also evident in the lack of thorough knowledge of all current program requirements by the majority of attendees (9) and low attendance in the program overview webinar (8). Of the respondents (10) who recalled attending the CAMFEB training, all cited that the subject aligned with their professional development goals and related to their industry background in design, construction, and energy management. Furthermore, the majority of raters (8/10) that attended the in-person training agreed that receiving the BPI or GreenPoint certifications was the most valuable aspect of the training itself. At least half of those respondents indicated they wanted to be at least qualified and certified to serve customers in the event they receive or pursue work in the multifamily existing market.

24 The training was free; the BPI exam was not. Attendees may have used the term "affordable" to encapsulate the value of the training over the opportunity costs (e.g., lost work time, travel, etc.).

Overall, most attendees (8) did not have any issues with the training curriculum and felt the sessions were well conducted by actual industry professionals. However, 3 raters expressed some disappointment during the training session. For example, they complained that there was a lack of fieldwork exercises to practice what was taught in class. One rater also noted the curriculum overly-focused on older building systems, such as steam boilers, which was not relevant to the common building types in his service territory. Furthermore, another respondent noted a lack of clarity on legal matters such as who the responsible party is for program related liabilities.

Main Pilot Feedback and Suggestions for Full Program Roll-Out

Overall, the majority of non-participating raters think that the pilot design is fine as it currently stands. Moreover, 10 out of 12 respondents did not recall any notable issues with the program requirements as a rater. However, two respondents encountered issues with the program refusing to accept their initial applications for potential projects. Each rater tried to apply twice to the pilot, the first applications were rejected because the properties did not qualify and the second applications were rejected because the pilot had already reached its limit on new applications.

From the raters' perspective, current market conditions favor the new construction market because there are is more work available and it is often more lucrative than retrofits. Therefore these raters are spending most of their time focused on new construction instead of the multifamily retrofit market. Raters mentioned that the multifamily property owners are very cost conscious and have not been receptive to paying for assessments or deep energy upgrades which has led to raters shying away from this market. All non-participating raters mentioned that their businesses are primarily catered to new construction single-family, multifamily, or commercial due to high demand. Of the respondents (8) who claimed to be active in the multifamily retrofit sector, all of them expressed difficulty in convincing property owners to consider these energy efficiency assessments or upgrades because of the split incentive issue. These raters mentioned that affordable housing properties are more likely to be interested in the EUC-MF program in order to offset costs from complying with regulations requiring their properties to meet certain energy efficiency standards or else lose government funding.

Non-participating raters did recommend some changes to the program for consideration including:

- Changes to the program's building classification system and marketing strategies to drive new traffic into the program. Two out of 12 respondents suggested classifying fourplex buildings or dormitories as part of multifamily because that is the market they serve but are unable to qualify them into the program.
- Half of the raters (6) recommended some ways to market the program that might persuade market-rate property owners to take an interest in the program. For example, one rater suggested marketing the program measures as cost-effective in terms of ROI, higher quality, and having the ability to increase property value. Additionally, another rater recommended educating tenants on the benefits of these assessments and upgrades thereby applying pressure on property owners to accommodate their tenants' requests.
- Two respondents noted current incentive levels are not enough to offset the actual costs of doing a thorough assessment of a building. Considering how cost conscious market-rate property owners generally are, they are unlikely to pay for both a building assessment and upgrades simultaneously. Therefore, it was recommended that the program increase the assessment incentive amount closer

to the actual cost of a whole-building assessment to better attract and encourage multifamily existing owners and property managers to participate.

Non-Participant Rater Characteristics

Respondents who attended the training come from a variety of professions with whole-building assessments representing only a small portion of their overall services offered. The common professions include energy consulting, construction, or retrofit/installations for single-family, multifamily new construction, or commercial markets. Notably, only 5 respondents had actual experience (ranging from 2 to 50 properties) conducting an assessment for a multifamily property. Despite the lack of involvement in the multifamily retrofit market or whole-building assessments, 9 out of 12 respondents carried at least a BPI or GreenPoint for existing for either single-family, multifamily, or both in new construction or existing. On average respondents (11) had 8 years of experience performing whole-building assessments in general.

Reaching Raters

Half of the raters found out about the pilot through Build it Green directly either by email, phone, or in-person. Four other respondents found out about the program by participating in similar trainings or programs. The majority of respondents (9) stated the best way to introduce these programs was through direct email or call, followed by professional events (4) such as forums, workshops, or training sessions.

Participation Decision Summary

The lack of potential existing multifamily clients is the primary reason most raters (8) have not participated in the EUC-MF pilot yet. Moreover, six of these raters indicated that the multifamily retrofit sector is not their targeted customer-base and, as a result, had no intention to participate. Other reasons for not participating include:

- Conflict of interest. One respondent indicated she was working for the city government as Energy Efficiency consultant that promotes a similar “Bay Ren” program. Furthermore, she is not allowed to promote external programs although she can refer clients to them.
- The pilot does not relate to the respondent’s business services. Half the respondents indicated Multifamily existing sector and building assessment is not their primary business service
- Legal/liability concerns. One respondent mentioned how the training did not address who the rater should turn to for advice or how to handle legal problems that arise such as rebate imbursement delays or customer warranties from faulty assessment.
- Building qualification issues. Two respondents noted that applications were rejected when they attempted to submit what they believed should qualifying multifamily properties. Specifically, dormitories and fourplexes are not considered multifamily properties

Notably, 9 out of the 12 raters say they will likely participate in the program in the future if market condition changes and there is a noticeable demand of multifamily retrofit clients requesting their services. However, new construction residential is currently the most profitable market for them.

5. BILLING ANALYSIS FEASIBILITY AND DATA NEEDS

Verifying the energy savings from this program could be done through a billing analysis or calibrated engineering computer simulations. The evaluation set out to determine whether a billing analysis could be done on these pilot participants.

As stated in the California Framework, "billing analysis will tend to be preferred when:

- Both pre and post-retrofit billing data are available
- Expected program impacts can be expected to be observed in a billing analysis (e.g., at least 10% of total consumption, depending upon method used, cleanliness of billing data, and accuracy of measured variables in analysis)
- More often used than engineering analysis for programs with larger numbers of participants that are more homogenous"[25]

As seen elsewhere in this report, the program design requires a threshold of 10% and therefore seems like a positive candidate for a billing analysis.

The need for billing data from at least 12 months pre and 12 months post-retrofit means that the impact assessment necessarily occurs well past the time of the retrofit. Additionally, billing analysis requires that 24 months of bills be from the same family within the unit. For multifamily units, this can cause a reduction in available population as people move in and out and is often exacerbated with low income multifamily units that can see turnover as high as 30% a year. The ability of a billing analysis to obtain impacts is reduced when population goes down, but is not absent. At times, billing analyses have occurred with only 100 units and provided reliable results. This pilot of seven buildings, has 513 units. As such, while the transient nature of this market is noteworthy, it can be overcome within a billing analysis.

Typically, the homogeneity of energy use within a multifamily building is relatively high. While the number of occupants and plug loads may vary from dwelling to dwelling, the square foot available for all households is similar, helping to drive somewhat similar energy use (at least in the order of magnitude to which billing analysis is sensitive). Therefore, a billing analysis seems possible.

There are only two key inputs for billing analysis, but several inputs that can help tease out the actual results from an intervention with more certainty. The first main input is 24 months of electric and gas energy use and knowledge of which specific dwellings had turnover during that period. Analysis can occur with either monthly or hourly inputs, but hourly data is required for any billing analysis to obtain estimates of demand savings. The second input is the date of measure installation for each measure installed. The format of the billing history data (e.g. hourly or daily) drives how precise the measure installation date can be. In a billing analysis, a "deadband" is placed around the times when measures are being installed and data from that period is removed from the analysis. With hourly data, the actual set of days when measure specific installation began and ended allows for the analysis to have a smaller deadband (i.e., drop less data) and separate out impacts due to installation of several measures, if those

25 The California Framework. TecMarket Works. 2004. p 94.

installations took place over time. If monthly data is available, knowing if installations occurred across billing periods is crucial to keep the deadband smaller.

Other pieces of information, while useful for fully specifying a model, are less crucial. This includes information about the occupants (e.g., how many people live in a unit) and how they use their space (e.g., thermostat set points, type of amount of plug load equipment). This data is often gathered via telephone survey. However, because all points in a billing analysis requires the same data and any survey does not include the entire population, bringing in more specific information through this data collection reduces the number of data points available for a billing analysis.

As stated above, it is feasible to use a billing analysis for this pilot program. The impacts associated with the measure installations are expected to be above 10% of use, a typical threshold for the ability of any billing analysis to determine changes. There are sufficient number of individual units within the pilots (513) and the energy use within the individual units are expected to be relatively homogeneous. All these factors support the use of billing analysis.

For this pilot, the availability of billing data is assumed to be present and good. When turn over occurs, there is a change in account number. Therefore, the evaluation team would know move in and move out dates. We also assume that PG&E would be able to "find" each of these individual units through knowing the address of the renovated building and unit numbers.

From looking at the project information what fuel is master or individually metered is documented for all projects and the date of installations is also known. However, the exact meter numbers are not documented in program records.

Table 15. Pilot Project Billing Analysis Potential

	% of units occupied	Master Meters	Unit Meters	Date of test-out	Potential billing analysis?
Property 1 (n=100 units)	100%	Gas Only	Electric only	11/21/2013	Electric Impact
Property 2 (n=216 units)	~ 50%	Gas Only	Electric only	11/18/2013	Electric Impact
Property 3 (n=64 units)	100%	Gas Only	Electric only	11/25/2013	Electric Impact
Property 4 (n=32 units)	100%	n/a	Electric & Gas	11/26/2013	Electric & Gas Impact
Property 5 (n=20 units)	0%	n/a	Electric & Gas	12/5/2013	Electric & Gas Impact
Property 6 (n=17 units)	~ 50%	n/a	Electric and Gas	12/4/2013	Electric & Gas Impact
Property 7 (n=64 units)	100%	n/a	Electric & Gas	12/13/2013	Electric & Gas Impact

The more crucial input for this pilot is the measure information. The program could improve the tracking of the final, verified, measures moving forward. When reviewing the seven projects in the pilot, we had difficulty finding the latest measure information and aligning savings from the two main sources of information – the verification report and the Econ report (EnergyPro results with updated measures based on the test-out verification).

To determine whether billing analysis can be done, we make two recommendations for this pilot:

- **Perform a test match for billing data:** To assure that billing data from individual units can easily be found and that the evaluation team could track turnover, we suggest that PG&E perform a trial run and attempt to pull all the individual unit energy use (12 months pre and as many months post as possible) from a single building. The San Leandro property might be the best test case given that it has the largest number of units treated, should have at least 3 full months of post usage data, and the property owner indicated a mix of occupied and unoccupied units. The Fresno property would also be a good test-case since this property has 64 units and all electric and gas usage is individually metered. This will show how many unit and master meter numbers PG&E is able to find based on address and unit numbers.
- **Update project information:** To improve the likelihood of any evaluation team using the final and best measure data within a billing analysis, we recommend that PG&E and their implementer, Build It Green, create and maintain a database of only final measures with specific dates of installation. Additionally, we recommend that there be QA on the database to assure that the estimated gas and electric savings align with the final EnergyPro modeling output.

6. SUMMARY OF LITERATURE ON MULTIFAMILY MARKET BEST PRACTICES

The evaluation team conducted a literature review to search for best practices in implementing multifamily programs. The following section summarizes these findings in the categories of Implementation, Design and Marketing and also describes how the pilot is or is not adhering to these practices.

Implementation

Best practices in multifamily program implementation are:

- **Consider participation timeline when setting program expectations:** Generally, multifamily whole-building retrofit projects take a long time to complete. Previous research on multifamily pilots in California found that on average a multifamily project takes "7.6 months to complete – from pre-qualification to incentive payment. Similar to new construction programs, the allowable construction timeframe could roll from program to program with a 12 to 18 month completion timeline"[26]. This timing is important to keep in mind when setting program expectations for any given year and when assessing the accomplishments of this pilot which only had a few months to gain participation from pre-qualification to incentive payments.
- **Provide one main contact for projects undergoing retrofits:** Given that whole-building design programs involve multiple stakeholders, multiple steps and multiple incentive types, best practices suggest that these programs should offer property owners one point of contact for all possible project participation, which may take several months to complete. One main contact helps overcome technical and program process-related confusion among owners as well as transaction costs. Minimizing confusion is a key component to participant satisfaction.

Providing one contact appeared to happen with some inconsistency during the pilot. Raters are sometimes the key point of contact and at other times the implementer is. In some cases, the property owners did not know who their key point of contact was supposed to be. It will be important that this program sets up protocols for assigning a main contact and establishes infrastructure to allow this person to be informed of project status and program processes at all times. Protocols for this will become increasingly important as this program increases in scale and the implementer may not be able to do as much handholding with participants as it did during the pilot period.

Working with Contractors

The bullets below summarize best practices related to contractors for multifamily programs that are similar to the **MFEER program. Given that the pilot primarily relies on raters to interface with property owners, these practices may not apply to contractors but instead to raters given their role in the pilot.**

Best practices for multifamily programs working with contractors are to:

- Create a contractor-driven program to leverage existing contractor relationships with owners while developing newer ones to secure a long-term source of program recruits;

26 Lessons Learned through Piloting Energy Upgrade California™ Multifamily Programs; HMG TRC, July 2013

- Bring contractors into the program early;
- Use and develop the contractor base to build strong relationships between utility, contractors and owners; and
- Provide contractors with tools (specifications, incentive plans, marketing pieces) and training to sell owners on the value of deep retrofits.

Further, best practices suggest that clear communication is needed between the ESA program contractor and the EUC-MF rater. In order for program raters to include ESAP-installed measures in baseline conditions, the ESA program contractor must communicate these upgrades to the rater[27].

The pilot is adhering to these best practices with its participating raters and is allowing property owners to choose their own contractors based on the property manager's preference. Once the pilot becomes a full program, the program will need to invest in creating marketing pieces (including a successful case study with a market-rate property when possible) to help raters sell the program.

Program Design

Best practices in multifamily program design are:

- **Coordinate or integrate programs across gas, electric, and water utilities to minimize burden on owners and minimize transaction costs:** The pilot currently integrates gas and electric savings opportunities. To align with this practice the program would need to start partnering with water utilities. According to a recent study of landlords in CA, "all landlords feel the brunt of rising utility costs, with water costs often being a more prominent concern than energy costs."[28]
- **Serve low-income and market-rate multifamily properties but account for differences between the two types:** To encourage deeper retrofits in affordable housing projects, provide rate-payer/utility funding at the same time the CTCAC allocates the LIHTC tax credits. The pilot is adhering to this best practice.
- **Use on-bill repayment or attractive financing to minimize the upfront cost barrier:** PG&E is currently working on an on-bill financing option.
- **Use an escalating, performance-based incentive structure to encourage deep retrofits based on actual (evaluated) levels of savings:** The pilot is currently adhering to this best practice.
- **Offer incentives that cover the majority of project cost**. Market-rate building owners are focused on the bottom line (profitability), so high incentives (covering the majority of their cost) will attract participation quickly.
- **Offer the project incentives to the building owner instead of the contractor:** This incentive delivery mechanism is preferred by contractors.
- **Have the assessment incentive go to the rater or property owner:** This maximizes marketing outreach because raters are incented to market the program in addition to what is done by the implementer or utility.

27 Lessons Learned through Piloting Energy Upgrade California™ Multifamily Programs; HMG TRC, July 2013

28 2010-2012 PG&E and SCE Multifamily Energy Efficiency Rebate Program (MFEER) Process Evaluation and Market Characterization Study; April 2013; The Cadmus Group

- **Offer technical assistance:** Incentives are influential but the program may also provide value by offering technical assistance in the form of facilitating the process toward certifications such as LEED, benchmarking assistance or financial analysis. Offering these additional services may not lead to immediate energy upgrades but could begin a trusted relationship that may influence energy upgrade decisions in the future.
- **Employ a consultant (rater) driven program design model:** This model has been found to work effectively for the multifamily sector. While this was mentioned in other studies, it is uncertain as to whether this has been effective for both affordable housing and market-rate.
- **Maintain consistency in the program over time:** The program needs consistency and longevity to develop the rater market.
- **Maximize the opportunity for property owners to use their participation in the program for marketing and tenant retention purposes:** Market-rate multifamily owners see value in energy and green ratings in recruiting and retaining tenants. Past research suggests that the HERS asset-based rating would be well-received. Interviews from this pilot study suggest that LEED might also be well-received.
- **Provide a range of options to the market:** Potential positive program outcomes, such as tenant satisfaction and common area savings, generate trust and encourage additional participation over the long term. Best practices for reaching the multifamily market suggest that programs take a comprehensive approach that includes a range of measure types and audit levels. Measures should include in-unit and common-area measures and range in complexity from direct install measures to lighting, insulation and air-sealing. Audits should range from no-cost to low-cost audits.

  The pilot is adhering to this best practice both in its current program design and its SPOC approach whereby the SPOC is able to describe the range of multifamily programs available to property owners. These multifamily program offerings range from no-cost to high-cost audits and include a range of measure options.

Marketing

There are roughly 25,000 market-rate multifamily properties in PG&E territory[29]. Lessons learned from implementing similar multifamily programs across the state suggest that "a grassroots marketing approach, when combined with a strong incentive/financing package is most effective for program recruitment" [30]. Email blasts to association member lists, phone call recruitment, and presentations at events and conferences have proven effective in the past[31]. Using success stories in marketing materials and presentations helps to foster peer-to-peer or word-of-mouth marketing which is also highly effective in building trust from the market and fostering interest in participation.

Best practices for marketing multifamily programs are to:

29 ESA program Multifamily Segment Study Volume 1: Report; December 4, 2013; Research Into Action, page vi
30 Lessons Learned through Piloting Energy Upgrade California™ Multifamily Programs; HMG TRC, July 2013
31 Lessons Learned through Piloting Energy Upgrade California™ Multifamily Programs; HMG TRC, July 2013

- **Partner with industry networks and associations to market to multifamily property owners and managers directly and to understand the sector's needs:** As the program progresses it should consider the following associations that interviewees mentioned in this study:
  - Apartment Owners Association
  - Association of Realtors
  - California Apartment Association
  - California Coalition for Rural Housing
  - California Housing Consortium
  - California Housing Partnership
  - Community Development Corporations
  - East Bay Housing Organization
  - Housing California
  - Housing Leadership Council of San Mateo County
  - Housing Partnership Network
  - Housing Trust of Santa Clara County
  - Multifamily Green Commission
  - National Affordable Housing Management Association
  - National Apartment Association
  - National Association of Housing and Redevelopment Officials
  - National Housing Trust
  - National Multifamily Housing Conference
  - Non-profit Housing Association of Northern CA
  - Silicon Valley Leadership Group
  - State Treasurer's Office
  - Urban Land Institute
  - US Green Building Council
- **Tailor marketing to tenant income strata**[32]**:** Owners with low-income tenants are most concerned about safety, protecting and growing their investments. They may be green-oriented. Owners who rent to middle-class tenants want to reduce problems, keep turnover low, and to increase their rents over time. Owners with high-rent tenants focus on return on investment, the appeal of the property and its amenities.

32 2010-2012 PG&E and SCE Multifamily Energy Efficiency Rebate Program (MFEER) Process Evaluation and Market Characterization Study; April 2013; The Cadmus Group

Energy Saving Verification

We found three different measurement and verification methods: (1) Pre/post billing analysis performed by an external evaluator; (2) Building a tool that standardizes billing analysis using prototype and billing data and adding this to the program's implementation procedures 12 months post installation (NYSERDA's approach) and (3) individual building models using bill history for calibration (Puget Sound Energy's approach).

7. SELECT PROGRAM COMPARISONS

We compared and contrasted the pilot to two programs, NYSERDA's Multifamily Performance Program (MPP) and SMUD's Home Performance Program-Multifamily (HP-MF), with similar whole-building program designs. These two programs were similar in nature to the pilot's program design and have seen some success in reaching multifamily market-rate properties. Further, these two programs have some interesting design elements including persistence incentives[33], financing products, and alternative approaches to measuring energy savings. We summarize program details based on industry papers, evaluation reports and interviews with NYSERDA and SMUD program staff. Table 16, below, compares these two programs to the pilot across several parameters. There are a few key differences that the pilot should consider in its design.

Persistence Incentives

For the purpose of this comparison, we distinguish the difference between performance-based incentives and persistence incentives. A **performance-based incentive** is a variable incentive based on the amount of expected savings after a retrofit is complete. The SMUD and PG&E pilot programs have this incentive but differ in the incentive structure. A **persistence incentive**, defined in this report, is a variable incentive that is given to participants 1 year after measures are installed and is based on the amount of measured savings. Persistence incentives are part of the NYSERDA program but not the pilot or SMUD's program. Persistence incentives are attractive to utilities because they encourage ongoing energy conserving behavior from tenants and property management. They can be beneficial because:

- A persistence incentive focusses tenants, property owners, raters, and contractors on long term savings, such that they maintain installed measures and efficient operation practices;
- The incentive helps ensure the predicted vs. actual program savings comparison is evaluated and documented; and
- Documented long-term savings helps focus the market and investors on energy efficiency.

However, persistence incentives can also be cumbersome from an administrative standpoint. A large amount of work is needed to develop a standardized approach to the billing analysis that determines the persistence incentive in addition to the training required of raters, amount of data needed from the utility and the raters' time to calculate this for each participant. The NYSERDA program slowly introduced the persistence incentive after a few years of implementation. As such, the pilot may want to wait to introduce this added complexity to the program after it gains some traction in the marketplace.

Assessment Incentives

All three programs offer assessment incentives. However, the NYSERDA and SMUD programs offer this incentive on a conditional basis. The SMUD program gives 35% after the assessment and another 65% after the test-out process proves that the unit will save at least 10%. The NYSERDA program gives 100% of the incentive but only after the property owner develops an energy reduction plan that is approved by the program. The pilot may consider some conditional parameters around its assessment incentive at

33 By "persistence" incentive we mean an incentive that is offered for measured savings that persist across a time period of multiple months (e.g., a year), as compared to modeled or measured savings calculated just after a retrofit is completed.

some point however it may want to wait to implement this change until after it has gained some participation from market-rate properties and is able to build upon this success as a marketing tool to gain more market-rate participants. Making this incentive conditional may put up another barrier in this hard to reach market at this point.

Estimating Energy Savings

Estimated energy savings for recommended energy efficient measures are determined for the NYSERDA and SMUD Multifamily programs using two different approaches. The differences in approaches are largely tied to varying incentive structures across program designs.

The NYSERDA program provides energy estimates to building owners through a benchmarking tool created by the Oakridge National Laboratory (ORNL). The benchmarking tool produces a score between 1 and 100 which allows building owners to compare existing building performance to other buildings with similar characteristics. This tool helps to talk about the potential ROI and energy savings for a property prior to investing the time and money into an assessment. The benchmarking tool uses utility data and converts it to source energy use by applying the appropriate state utility conversion factors. For buildings that are individually metered, a 10% sample is used and applied to the population to determine the building's overall energy achievements.

When the property decides to engage in an assessment, the tool is expanded to include assessment and modeling results to produce the percentage of energy savings that can be expected with the installation of the recommended measures.

The estimated percentage of savings needs to be at least 20% for the project to be approved. No additional estimation of energy savings is performed right after the retrofit because the units each receive the same incentive amount regardless of performance at this point. 12-18 months after the installation, the program developed a tool (the Energy Reduction Plan Tool) to calculate the actual savings percentage for each unit based on a pre/post billing analysis. At this time, additional (persistence) incentives are given to units based on the actual percentage of energy savings.

Similar to the PG&E pilot, the SMUD program estimates energy savings for the installed energy efficient measures by carrying out an energy analysis using the California Energy Commission (CEC) approved HERS II modeling simulation software; EnergyPro. The building characteristics for pre-construction conditions are modeled using EnergyPro to generate an energy consumption report. After the installation of energy efficient measures, the modeled building is updated to reflect the post-construction modifications. The energy consumption generated from the modeling software for both the existing building and the energy efficient model are compared to each other and used to calculate the overall building energy savings.

Table 16. Comparison of Pilot, NYSERDA and SMUD Multifamily Programs

	PG&E Multifamily EUC Pilot	NYSERDA Multifamily Performance Program[1]	SMUD Home Performance Program-Multifamily
Launch	February 2013	2007, it has undergone a few iterations focused on creating a SPOC, increasing clarity, and providing per-unit and persistence incentives.	2010 with ARRA funding, it has recently been re-designed when the SEP grant ended.
Measures Offered	Any measures that can be modeled in EnergyPro such that pre to post energy savings is at least 10%.	Any measures that can be modeled by program-approved software (e.g., TREAT, eQuest) that project at least 15% electric and gas savings.	At least two different building shell upgrades (including HVAC system, windows, insulation, lighting, and electric hot water systems) that can produce at least 10% electric savings as modeled in EnergyPro.
Participation	7 properties, 513 units	93 buildings with 3,600 units[34]	2,513 units[35]
Owner role	Hire rater and contractors	Same	Same
Rater role	The program-approved rater processes and submits all applications, conducts an ASHRAE Level II audit, checks for CAS issues, recommends improvements, inspects completed retrofits, and performs test-out.	The program-approved rater processes and submits all applications, conducts an ASHRAE Level II audit, recommends improvements, inspects completed retrofits, and analyzes post-retrofit energy usage using the program's Energy Reduction Plan Tool (ERP)[2] to qualify for the persistence rebate.	Certified HERS II rater is responsible for pre- and post-retrofit energy assessment, retrofit recommendations, EnergyPro modeling of savings, post-retrofit verification, and collection of all project documentation.
Contractor role	Complete upgrades	Same	Same
Assessment Incentive	The program pays the property owner or a designee the assessment incentive upon completion of the assessment. Incentives range from $2,500 to $10,000 depending on the number of units and whether the property is affordable or market-rate. Incentives increase when the property has more than 100 units. (see Appendix Table 19 for more detail)	■ The program pays the owner a "Stage 1" incentive upon approval of the energy reduction plan when the project has between 5-49 units. Incentives range from $50 to $100/unit depending on affordable or market-rate, and whether or not it is firm gas.[3] (see Appendix Table 21 for more detail)	■ The program pays the rater an assessment incentive of $85/unit in two payments: ■ 35% is paid at completion of assessment, ■ 65% is paid after verification is complete and only if entire project is completed with 10% improvement.

34 http://aceee.org/files/pdf/resource/falk_robbins_results_from_nyserda's_mpp_ss2010.pdf),

35 Home_Performance_Program-SMUD_Final_Report_04-2012.pdf (page 19) * As of 2012

	PG&E Multifamily EUC Pilot	NYSERDA Multifamily Performance Program[1]	SMUD Home Performance Program-Multifamily
		■ Projects with 50 or more units are not paid at this time.	
Performance-based Incentive	The program pays the property owners or a designee the upgrade incentive upon completion of the retrofit. The tiered incentive structure ranges from $600 to $1,500 per unit based on the post-upgrade modeled savings range of 10% to more than 40%. (see Appendix Table 20 for more detail)	■ The program pays the owner a "Stage 2" incentive upon the rater's inspection of 50% or more of the completed retrofits. Incentives range from $200 to $500/unit depending on affordable housing or market-rate, whether project is firm gas, and whether the number of units is less than 50. ■ The program pays the owner a "Stage 3" incentive upon the rater's inspection of 100% of the completed retrofits. Incentives range from $250 to $500/unit depending on the same conditions noted for the Stage 2 incentive. (see Appendix Table 21 for more detail)	The program combines a base incentive and a performance-based incentive into a single payment paid to the owner after the rater performs the HERS II verification. The incentive is $350/unit plus an escalating performance incentive of $35/unit for each additional 1% of energy savings up to 50%.
Persistence Incentive	none	The program pays the owner per/unit incentives based on measured energy savings as calculated by the rater who uses the ERP tool and inputs twelve months of continuous energy usage data. Incentives range from $150 to $300 depending on savings that meet or exceed 20%. (see Appendix Table 22 for more detail)	None
Estimating Savings After Measure Installation	Rater verifies installations and performs a test-out. Post-retrofit savings are modeled in the EnergyPro software.	Estimated energy savings are determined by the use of a benchmarking tool developed by Oakridge National Laboratory (ORNL).	The comparison of pre-construction and post-construction building models are used to estimate the energy savings using EnergyPro modeling software.
Average Savings	25% (ex ante, unverified)	23% [4] (verification status unknown)	29% [5] (verification status unknown)

	PG&E Multifamily EUC Pilot	NYSERDA Multifamily Performance Program[1]	SMUD Home Performance Program-Multifamily
Financing	None; however PG&E is working on a financing pilot	Program participants are Eligible for ½ market-rate financing through Green Jobs NY up to $500K[6]	PM directs participants to Ygrene (https://ygrene.us/) which is modeled after the Sonoma County PACE program and "offers unlimited private financing … allowing property owners to finance projects without finding their own loans in a difficult market"[7]

[1] The NYSERDA program's "Standard Path" is shown in this table. However the program also offers a "Fast Track" not shown in this table which is similar to the standard path but is for projects of 5-49 units and includes a comprehensive audit with specially-designed Fast-track audit software. These projects do not complete a simulation model.

[2] The Energy Reduction Plan Tool (ERP) is an expanded version of the utility data analysis tool (UDAT). The ERP tool is Excel-based and was created by Oakridge labs using the building data from 500 existing buildings. Raters use the ERP tool to benchmark building, model savings, and calculate the persistence incentive. The tool standardizes billing analyses by incorporating benchmark scores, conversion factors, etc. in the background.

[3] As defined in the program's Terms and Conditions, a firm gas project is "A project in which all buildings within a project pay into the System Benefits Charge fund through a firm gas heating rate as defined by the Participant's utility for their primary space heating fuel." A non-firm gas project is defined as "project in which any building within a project does not pay into the System Benefits Charge fund through a firm gas heating rate as defined by the Participant's utility for their primary space heating fuel."

[4] Source: Apartment Hunters: Programs Searching for Energy Savings in Multifamily Buildings (ACEEE; 12/2013)

[5] Source: Home Performance Program Final Report (SMUD; 4/30/2013)

[6] Green Jobs NY, http://www.nyserda.ny.gov/BusinessAreas/Energy-Efficiency-and-Renewable-Programs/Multifamily-Performance-Program/GJGNY-Borrower.aspx.

[7] https://ygrene.us/model

APPENDICES

A. PROJECT-BY-PROJECT DESCRIPTIONS

This section summarizes the characteristics of each of the seven participating properties in the pilot.

Fremont Project

The EUC program–sponsored energy retrofits took place during a larger rehabilitation project that began in January 2013 as part of a 15-year tax credit syndication. The rater brought the pilot to the owner's attention before the project embarked on the second phase of the rehabilitation which began in May 2013. At first, only the buildings that had not yet been rehabbed were going to be enrolled into the pilot, but then all 100 units were allowed into the program.

Project Summary

City	Fremont, CA
Units Retrofitted	100
Year Built	1972
Market Status	Affordable housing
Units rented or owned?	Rented
Assessment Incentive	$10,000
Construction Incentive	$79,200
Project Cost (overall)	$6,230,354 total project cost across the 100 units (per verification report)
CAS Issues identified during test-in/ assessment (Y/N)	Yes
CAS Issues identified during test-out/ verification (Y/N)	Yes

Energy Savings Documentation

Units Retrofitted	100
Climate Zone	3
Incentive & Savings Percentage Range	86 units in the 15-19.5% savings range eligible for incentive of $750/unit 14 units in the 25-29.5% savings range eligible for incentive of $1,050/unit
kWh Savings	86 units: 149,138 kWh 14 units: 52,493 kWh Leasing Office: 2,820 kWh Average Savings is 1,968 kWh/unit
Therms Savings	Leasing Office: - 31 therms (added energy needed to heat the building in the winter due to installed cool roof)
ESA Participation	37 units participated in 2000
Electricity Meter	Individually-metered
Gas Meter	Master-metered
Number of Stories	2 two-story buildings and 2 three-story buildings

Energy Savings Documentation

Occupancy Notes	Tenants were moved out of the units for 120 days before the measures were installed but arrived back while the verifications were still being conducted (per owner interview)
Measures Installed in Units	Wall Insulation R-15 Double Pane Vinyl Frame Windows (U-value 0.33 SHGC 0.30) PTAC Heat Pump EER 11.3 COP 3.3 (qty: 177)[36] PTAC Heat Pump EER 9.4 COP 2.9 (qty: 27)[37] ENERGY STAR® Refrigerator (qty: 100) ENERGY STAR® Dishwasher EF 0.85 (qty: 100) 1.5 gpm low flow bathroom aerators (qty: 100)
Measures Installed in Common Areas	Cool Roof (reflectivity 0.63; thermal emittance 0.92) Wall Insulation R-15 Split Unit A/C SEER 14.5 / Forced air gas furnace AFUE 0.8 Electric Hot Water Heater 40 gallon EF 0.95
Verification Date (Test-Out Date):	11/21/2013

San Leandro Project

The EUC program–sponsored energy retrofits took place during a larger rehabilitation project in which the property was transformed from a market-rate to an affordable housing property. This process will occur over a span of years, 2012 to 2014. The owner planned to ensure that the renovations qualified for the CTCAC tax credit.

Project Summary

City	San Leandro
Units Retrofitted	216
Year Built	1972
Market Status	Affordable Housing
Units rented or owned?	Rented
Assessment Incentive	$12,320
Construction Incentive	$194,400
Project Cost (overall)	$6,965,723 (per construction contract; likely overall rehab costs and for the entire property, i.e., the 840 units of which 216 received program upgrades)
CAS Issues identified during test-in/ assessment (Y/N)	Yes
CAS Issues identified during test-out/ verification (Y/N)	Yes

36 Quantities provided in verification report but exceed the 100 units treated.
37 Ibid

Energy Savings Documentation

Units Retrofitted	216
Climate Zone	3
Incentive & Savings Percentage Range	216 units in the 20-24.5% savings range eligible for incentive of $900/unit
kWh Savings	216 units: 247,961 kWh Average Savings is 1,148 kWh/unit
Therms Savings	216 units: 4,989 therms Average Savings is 23 therms/unit
ESA Participation	Have not participated in last 10 years
Electricity Meter	Individually-metered
Gas Meter	Master-metered
Number of Stories	2
Occupancy Notes	Some were occupied and some were not (per owner interview)
Measures Installed in Units	Double Pane Vinyl Frame Windows (U-value 0.34 SHGC 0.31) Indoor Lighting – High Efficacy Manual Controlled ENERGY STAR® Refrigerator Low Flow Showerheads 1.5 gpm
Measures Installed in Common Areas	Exterior Lighting
Verification Date (Test-Out Date):	11/18/2013

Richmond Project

The EUC program–sponsored energy retrofits took place during a larger rehabilitation project as part of a 15-year tax credit syndication. There was also Solar PV installed at the property during the rehab.

Project Summary

City	Richmond
Units Retrofitted	64
Year Built	1993
Market Status	Affordable housing
Units rented or owned?	Rented
Assessment Incentive	$10,000
Construction Incentive	$67,200
Project Cost (overall)	Entire rehab was approximately $6M (per interview with owner)
CAS Issues identified during test-in/ assessment (Y/N)	Yes
CAS Issues identified during test-out/ verification (Y/N)	No

Project Summary

Energy Savings Documentation	
Units Retrofitted	64
Climate Zone	3
Incentive & Savings Percentage Range	64 units in the 25-29.5% savings range eligible for incentive of $1,050/unit
kWh Savings	64 units: 62,866 kWh Average Savings is 982 kWh/unit
Therms Savings	64 units/Office Area: 3,557 therms Average Savings is 56 therms/unit
ESA Participation	11 units participated between 2007 and 2011, and 43 participated in 1998
Electricity Meter	Individually-metered
Gas Meter	Master-metered
Number of Stories	4
Occupancy Notes	Tenant occupied throughout (per owner interview)
Measures Installed in Units	Double Pane Vinyl Frame Windows (U-value 0.29 SHGC 0.22) ENERGY STAR® Rated Refrigerator (Qty: 64) Condensing Furnace 0.96 AFUE (Qty: 64)
Measures Installed in Common Areas	Domestic Gas Hot Water Heater – 100 gallon 93.3% RE (Qty: 3) – located in mechanical room (heats in-unit water usage, laundry and office) Condensing Furnace 0.96 AFUE (Qty: 1) - located in the office
Verification Date (Test-Out Date):	11/25/2013

Rohnert Park Project

The EUC program–sponsored energy retrofits took place during a larger rehabilitation project as part of a 15-year tax credit syndication.

Project Summary

City	Rohnert Park
Units Retrofitted	32
Year Built	1974
Market Status	Affordable housing
Units rented or owned?	Rented
Assessment Incentive	$10,000
Construction Incentive	$33,600
Project Cost (overall)	$2,845,754 (per construction contract; may include all 50 units as opposed to just the 32 that went through the program)
CAS Issues identified during test-in/ assessment (Y/N)	Y, see Appendix 0

Project Summary

CAS Issues identified during test-out/ verification (Y/N)	N, see Appendix C
Energy Savings Documentation	
Units Retrofitted	32
Climate Zone	2
Incentive & Savings Percentage Range	32 units in the 25-29.5% savings range eligible for incentive of $1,050/unit
kWh Savings	35,967 kWh Average savings is 1,124 kWh/unit
Therms Savings	4,741 therms
ESA Participation	47 units participated from 2008-2012
Electricity Meter	Individually-metered
Gas Meter	Individually-metered
Number of Stories	3
Occupancy Notes	Tenant occupied throughout (per owner interview)
Measures Installed in Units	Double Pane Vinyl Frame Windows (U-value 0.34 SHGC 0.31) Indoor Lighting – High Efficacy / Manual Control Domestic Gas Hot Water Heater – 50 gallon 96% RE
Measures Installed in Common Areas	Attic Insulation for a total of 16" of blown in cellulose (total R-44) Improve Duct Leakage 11% Outdoor Lighting – High Efficacy (located front porch and deck)
Verification Date (Test-Out Date):	11/26/2013

Stockton Project

The EUC program–sponsored energy retrofits took place during a larger rehabilitation project into which the owner was interested in bringing green elements. It was a complete rehab project meaning that the building was torn down to its frame and rebuilt.

Project Summary

City	Stockton
Units Retrofitted	20
Year Built	1971
Market Status	Affordable housing
Units rented or owned?	Rented
Assessment Incentive	$5,000
Construction Incentive	$30,000
Project Cost (overall)	$1,175,711.39 (per General Contractor agreement; likely includes entire rehab)

Project Summary

CAS Issues identified during test-in/ assessment (Y/N)	N (per email correspondence with program implementer)
CAS Issues identified during test-out/ verification (Y/N)	N (per email correspondence with program implementer)

Energy Savings Documentation

Units Retrofitted	20
Climate Zone	12
Incentive & Savings Percentage Range	20 units in the >40% savings range eligible for incentive of $1,500/unit
kWh Savings	20 units: 33,077 kWh Average Savings 1,654 kWh/unit
Therms Savings	20 units: 7,102 therms Average Savings 355 therms/unit
ESA Participation	16 units participated in 2005
Electricity Meter	Individually metered
Gas Meter	Individually metered
Number of Stories	2
Occupancy Notes	No tenants as this was a complete rehab (per contractor interview)
Measures Installed in Units[1]	Double Pane Vinyl Frame Windows (U-value 0.34 SHGC 0.31) Attic Insulation R-38 Wall Insulation R-13 Mini-Split Heat Pumps SEER 21 HSPF 10.0 (Q.20) Interior Lighting – High Efficacy Manual Controlled ENERGY STAR® Refrigerators (Q.20) Floor Partition & Cantilever Floor (R19)
Measures Installed in Common Areas	Exterior Lighting – High efficacy Gas Water Heater – 100 gallon 95% EF (serves all units)
Verification Date (Test-Out Date):	12/5/2013

Oakland Project

The EUC program–sponsored energy retrofits took place during a larger rehabilitation project as part of a 15-year tax credit syndication.

Project Summary

City	Oakland
Units Retrofitted	17
Year Built	1946
Market Status	Affordable housing

Project Summary

Units rented or owned?	Rented
Assessment Incentive	$5,000
Construction Incentive	$12,750
Project Cost (overall)	$60,539 (per [Oakland] Construction Costs which shows ECM costs across the three buildings)
CAS Issues identified during test-in/ assessment (Y/N)	n/a; CAS testing was not performed at test-in because the project began under another program and then transferred into the EUC Multifamily pilot (per [Oakland]Test In CAS document)
CAS Issues identified during test-out/ verification (Y/N)	Y (per the verification report)

Energy Savings Documentation

Units Retrofitted	17
Climate Zone	3
Incentive & Savings Percentage Range	17 units in the 15-19.5% savings range eligible for incentive of $750/unit
kWh Savings	17 units: 9,003 kWh Average Savings is 530 kWh/unit
Therms Savings	17 units: 944 therms Average Savings is 85 therms/unit
ESA Participation	17 units participated in 2009
Electricity Meter	Individually metered
Gas Meter	Individually metered
Number of Stories	2
Occupancy Notes	Some units remained occupied throughout the project; in other cases tenants were relocated for 3-5 days while the units underwent upgrades
Measures Installed in Units[1]	Double Pane Vinyl Frame Windows (U-value 0.31 SHGC 0.29) ENERGY STAR® Refrigerator (qty: 17) Floor Insulation R-19
Measures Installed in Common Areas	None
Verification Date (Test-Out Date):	12/4/2014

Fresno Project

The EUC program–sponsored energy retrofits were implemented because the owner saw the incentives as revenue for the rehab of an older property.

Project Summary

City	Fresno
Units Retrofitted	64
Year Built	1972
Market Status	Affordable housing
Units rented or owned?	Rented
Assessment Incentive	$10,000
Construction Incentive	$48,000
Project Cost (overall)	$112,000 (per verification report; estimated cost of energy saving measures)
CAS Issues identified during test-in/ assessment (Y/N)	Yes
CAS Issues identified during test-out/ verification (Y/N)	No

Energy Savings Documentation

Units Retrofitted	64
Climate Zone	13
Incentive & Savings Percentage Range	64 units in the 15-19.5% savings range eligible for incentive of $750/unit
kWh Savings	64 units: 75,211 kWh Average Savings is 1,175 kWh/unit
Therms Savings	64 units: 3,385 therms Average Savings is 53 therms/unit
ESA Participation	64 units participated in 2006
Electricity Meter	Individually metered
Gas Meter	Individually metered
Number of Stories	2
Occupancy Notes	Tenant occupied throughout (per owner interview)
Measures Installed in Units	Double Pane Vinyl Frame Windows (U-value 0.31 SHGC 0.29) Duct Sealing (14% leakage) Duct Replacement (Vinyl Flex Ducts R-8 insulation)
Measures Installed in Common Areas	
Verification Date (Test-Out Date):	12/13/2013

B. CAS ISSUES AT TEST-IN

Table 17. Test-In CAS Issues (based on program records)

Project	CAZ Issue	GSR Called PG&E Work Order #	PGE Confirmed Correction
[FREMONT]	Building 3: Gas Leak Between meter and shut off	7460290705	
	Building 3: Boiler CO = 163 ppm	7460290705	
	Building 4: Boiler CO = 121 ppm	7460290705	Confirmed by Karen at PGE on 11.08.13 @ 2:39p
[SAN LEANDRO]	Building 3400 WA: Flex line Gas Leak	Repaired Day of Inspection	
	Building 3400 WA: Boiler CO= 1000 ppm	Repaired Day of Inspection	
	Building 3500 SW: Both ends of flex lines Gas Leak	7074796473	
	Building 3500 SW: Spillage Fail	7074796473	Confirmed by KCO on 11.18
	Building 3200 SW: Boiler CO= 105 ppm	7074796089	Confirmed by KCO on 11.18 under work order 7074811314
	Building 500 CO: Shut off valve and gas meter Gas Leak	7074790234	Confirmed by KCO on 12.12 under work order 7074783086
	Building 2900 WA: Meter Gas Leak	7074804913	Confirmed by KCO on 11.18
	Building 3500 SP: Wall Gas leak	7074782244	Confirmed by KCO on 12.12 under work order 7074783112
[RICHMOND]	Richmond City Center: 3 DHW Boilers - Gas leak near End Cap	Completed in scope of work	Confirmed by BIG at test-out.
[ROHNERT PARK]	Gas leak at shutoff valve of newly installed DHW for unit A3	Repaired Day of Inspection	
	Building gas leak at meters located at Bldg G		
	Gas leak at meters located at Bldg G/B on Laundry side	4241543188	Confirmed by Karen at PGE on 11.27.13
[FRESNO]	808 W. Hawes Ave # 102: Oven Burner CO= 54 ppm	No Action Required	
	808 W. Hawes Ave # 204: Oven Burners CO= 72 ppm & 89 ppm	No Action Required	
	Laundry facility: Gas leak and Gas valve	-	
	Laundry facility: Meter Gas leak	-	Confirmed by Karen at PG&E on 11.06.13 at 11:04a

C. CAS ISSUES AT TEST-OUT

Table 18. Test-Out CAS Issues (based on program records)

Project	CAS Issue	Corrective Action/GSR Called PG&E Work Order #	PGE Confirmed Correction
[FREMONT]	Building 1, Floor 2 DHW Closet: Missing pipe insulation by circulation pump		
Test-Out Date: Nov. 21	Building 2, Floor 2, DHW Closet: 8" mesh covered with dirt and dust; Missing pipe insulation by circulation pump		
	Spillage/No CVA	7460290254	Contractor will fix, [RATER] to retest. If it fails, then [RATER] will call GSR. Partner will be onsite on 12/16
	Building 2 leak at inlet side of meter	7460290781	Confirmed
	Building 3, Floor 2 DHW: Missing pipe insulation by circulation pump		
	Building 4, Floor 2 DHW: No CVA, damper stuck, failed spillage @5min, missing pipe insulation by circulation pump	7460292266	Confirmed
	Community Center Bld DHW Closet: Gas leak at meter	7460287600	Confirmed
[SAN LEANDRO]	Building 4700 SP, Floor 1 Boiler Room DHW: Gas leak at meter	7074781915	
Test-Out Date: Nov. 18	Building 3500 SP, Floor 1 Boiler Room DHW: DHW short cycling and could not be tested for CO and draft		Partner to re-test 12/16/13
	Building 3300 CR, Floor 1 Boiler Room DHW: Sections of pipe insulation missing		
	Building 500 CO, Floor 2 Boiler Room DHW: Sections of pipe insulation missing		
	Building 2500 SW, Floor 1 Boiler Room DHW: Sections of pipe insulation missing		
	Building 2900 SW, Floor 1 Boiler Room DHW: EM Not installed		
	Building 3500 SW, Floor 2 (Platform) Boiler Room DHW: Passed draft but failed spillage at 5 mins	7074796783	Confirmed
	Building 3400 WA, Floor 1 Boiler Room DHW (Poor installation): Air free CO surpassed at 1000 ppm		Boiler replaced;[RATER] to re-test on 12/16/13
[RICHMOND]	Issues were corrected by onsite contractor during the time of FQC visit and test-out		
Test-Out Date: Nov. 25			
[ROHNERT PARK]	No CAS issues discovered at test-out; BIG FQC to verify EE measures were installed		
Test-Out Date: Nov. 26			
[FRESNO]	No CAS issues discovered at BIG FQC test-out		
Test-Out Date: Dec. 13			
[OAK CENTER]			
Test-Out Date: Dec. 3 and 4 (if necessary)			
[STCOKTON]			
Test-Out Date: Dec. 5			

D. PG&E EUC MULTIFAMILY INCENTIVE DETAILS

The following tables were extracted from PG&E program documents.[38] Table 19 lists the PG&E Multifamily Program assessment incentive.

Table 19. PG&E Multifamily Program Assessment Incentive

Number of Units	Non-Income Qualified	Income Qualified [2]
5-30 units	$2,500	$5,000
31-100 units	$5,000	$10,000
100+ units[1]	$10 per unit	$20 per unit

[1] For every unit over 100, a per unit, incremental incentive will be added to the fixed incentive amount.

[2] For properties with deed-restrictions for low-income residents or properties with 80% or more tenants receiving Section-8 vouchers.

Table 20 lists the PG&E Multifamily Program performance-based incentive.

Table 20. PG&E Multifamily Program Performance-based Incentive

Post-Upgrade Modeled Savings	$ per unit
10-14.5%	$600
15-19.5%	$750
20-24.5%	$900
25-29.5%	$1,050
30-34.5%	$1,200
35-39.5%	$1,350
>40%	$1,500

38 Energy Upgrade California (EUC) Multifamily Pilot Program Draft Participant Handbook, prepared by Build It Green, 3-26-2013

E. NYSERDA MPP INCENTIVE DETAILS

The following tables were extracted from NYSERDA program documents.[39] Table 21 lists the NYSERDA MPP Stage 1, 2 and 3 incentives.

Table 21. NYSERDA MPP Stage 1, 2 and 3 Incentives

	Stage 1		Stage 2		Stage 3	
	Upon approval of the Energy Reduction Plan		Upon inspection of at least 50% of the installed upgrades		Upon inspection of 100% of the installed upgrades	
	Firm Gas (per unit)	Non-Firm Gas (per unit)	Firm Gas (per unit)	Non-Firm Gas (per unit)	Firm Gas (per unit)	Non Firm Gas (per unit)
			Afford			
Standard Path 5-49 units	$100	$80	$400	$320	$500	$400
Standard Path 50 units & up	N/A	N/A	$500	$400	$500	$400
			Market-Rate			
Standard Path 5-49 units	$70	$50	$280	$200	$350	$250
Standard Path 50 units & up	N/A	N/A	$350	$250	$350	$250

Table 22 lists the NYSERDA MPP persistence incentives.[40] Note that NYSERDA refers to this incentive type as a performance incentive.

Table 22. NYSERDA MPP Persistence Incentive

Existing Buildings – Performance Payment Upon achievement of the project's minimum energy performance target of 20%. (per unit)	
Tier #1 - 20%-22%	$150
Tier #2 - 23%-25%	$200
Tier #3 - 26%-28%	$250
Tier #4 - 29%+	$300

39 NYSERDA MF Performance Program Terms and Conditions, July 2012
40 Ibid

Table 23 lists the maximum incentive levels for the NYSERDA MPP.[41]

Table 23. NYSERDA MPP Maximum Incentive

Existing Buildings - Maximum Incentives			
Affordable		Market-Rate	
Firm Gas (per unit)	Non-Firm Gas (per unit)	Firm Gas (per unit)	Non-Firm Gas (per unit)
$1,300	$1,100	$1,000	$800

41 Ibid

F. PARTICIPATING OWNER DATA TABLES

Permission to Use Quotes

This interview is part of an evaluation study. All transcripts will remain in confidence with the evaluation team. We would like to use quotes without names in our reporting to directly share participant experience. However, it is possible that even without a name, you could be identified through other information such as your property's name or characteristics. With this in mind, may we use direct quotes from this interview without identifying you by name or do you prefer that we not use quotes from this interview?

Note: throughout "dna" stands for did not ask. This was used in situations in which there was not have enough time to complete a full interview or it was used in cases where the interview content suggested that the question would not be relevant to the participant.

Project 1	Ok to use quotes but need to check each quote with owner before it goes in report
Project 2	Record; not ok to use quotes
Project 3	Ok to record and ok to use quotes
Project 4	Don't record; don't use quotes
Project 5	Record; don't use quotes-can only complete an abridged version of the interview
Project 6	Fine to record and use quotes
Project 7	Record; don't use quotes

Owner/Manager and Property Overview

1. Could you tell me your title with respect to [PROPERTY NAME], at [PROPERTY ADDRESS]? [IF NOT OWNER OR MANAGER, SEEK CONTACT INFORMATION FOR EITHER, THANK AND TERMINATE]

Project 1	Project manager; [OWNER] affordable housing; owns and operates company - coordinating all aspects of the rehab
Project 2	Director of operations at [OWNER] company which acted as the developer; oversaw market-rate to affordable; and oversaw construction
Project 3	Project manager at [OWNER] corporation and for the renovation; $6 million project
Project 4	Project manager
Project 5	Project manager at a developer of AH
Project 6	Managing Director
Project 7	Owner

2. First, I have some questions about your property and tenants.
    a. How many units does it have? How many stories is the building?

	Units	Stories
Project 1	100	2-2 story and 2 3 story
Project 2	840, but 216 participated	2 stories
Project 3	64	4 stories
Project 4	50	8 buildings; some are 2 and some are 3 stories
Project 5	20	dna
Project 6	80	2
Project 7	150 total units. 64 of which are all 1 bedroom, 2 story, 8-plexes. That qualifies for the MF pilot. The remaining 86 were in 4-plexes and duplexes, therefore qualifying for the SF components.	150 total units. 64 of which are all 1 bedroom, 2 story, 8-plexes. That qualifies for the MF pilot. The remaining 86 were in 4-plexes and duplexes, therefore qualifying for the SF components.

b. How many units were upgraded through the program?

Project 1	100
Project 2	216
Project 3	64
Project 4	32
Project 5	20
Project 6	17
Project 7	64

c. Do tenants pay their own utilities?

Project 1	Tenants pay electric not gas or water.
Project 2	Given an utility allowance; their rent is less that utility allowance-- based on the Housing Commission puts out the utility loans annually. Residents pay for electric - it is individually metered, it would get a utility allowance back in rent. their rent is less that utility allowance. they do pay for it but they get a credit in the form of the utility allowance.
Project 3	They pay gas and electric and we pay for hot water
Project 4	yes
Project 5	dna
Project 6	dna
Project 7	Yes but they are subsidized

d. Do tenants rent or own their units?

Project 1	rent
Project 2	rent
Project 3	rent
Project 4	rent
Project 5	dna
Project 6	rent
Project 7	rent

e. Is the property or a portion of the units affordable housing?

Project 1	All of it is AH
Project 2	Was Market-rate becoming AH; A lot of the residents qualified for the (AH) program based on the location and age of the project. it made sense to convert the project and do a rehab
Project 3	AH
Project 4	All of it is AH
Project 5	Non-profit AH
Project 6	All of it is AH
Project 7	All of it is AH

f. [IF A MIX OF AFFORDABLE HOUSING AND MARKET-RATE, ASK]

i. How many are affordable housing and how many are market-rate?

Project 1	n/a
Project 2	Was Market-rate becoming AH
Project 3	n/a
Project 4	n/a
Project 5	n/a
Project 6	n/a
Project 7	n/a

ii. Which units were upgraded? Affordable housing or market-rate?

Project 1	n/a
Project 2	Was Market-rate becoming AH
Project 3	AH
Project 4	n/a
Project 5	n/a

Project 6	n/a
Project 7	n/a

3. Could you describe the business structure of this property?
   Probe for:
   --Non-profit
   --Public housing
   --LLC
   --Corporate

Project 1	Non-profit AH; affordable housing developer and they also own and operate affordable housing
Project 2	Was MR, becoming AH slowly 2012 to 2014
Project 3	owned by a tax cut limited partnership. So the limited partnership is a single purpose entity and so Bridge is a non-profit but in order to get the tax benefits of loan commodity tax credits for profit entity has to be the ultimate owner of the project; It is a federal tax credit through… it is allocated by the state agency. So CTAC is the allocating agency in CA
Project 4	Non-profit AH, owned by a limited partner; general partner is non-profit organization
Project 5	Non-profit AH, but does not have investors and does not go through the 15 year cycle.
Project 6	[Oakland] is a property that was acquired by the [COMPANY] and we a sustainable technologies group is a subsidiary of the [COMPANY]. The [COMPANY] is a vertically integrated firm from development, construction, asset management, architecture and then sustainability. So my job in the Sustainable Technologies Group is to evaluate the technologies and confirm energy reduction across the portfolio. Does 15 year recapitalization cycles
Project 7	It is a HUD property. It is section-8, project 8-voucher contract. Built in 1972. HUD, subsidized, section 8, 30% income; it is a subsidized property through HUD, project based vouchers… it is a section-8 contract; the tenants pay 30% of their income, whatever that may be for the rent. The project is owned by a non-profit board made up of 9 individuals. It is a sole purpose entity as a non-profit…. not a tax credit property.

[ASK AS NECESSARY TO DETERMINE MARKET-RATE MANAGEMENT/OWNERSHIP]

4. Do you or your company manage or own any market-rate properties?

Project 1	no
Project 2	yes
Project 3	Very tiny percentage of the overall
Project 4	No
Project 5	No
Project 6	Yes but tiny % and n/a to CA
Project 7	Yes

[IF YES]

a. How many buildings, how many units?

Project 1	n/a
Project 2	About 1000 units
Project 3	2 properties, 200
Project 4	n/a
Project 5	n/a
Project 6	n/a
Project 7	Well condos, SF, MF… this is the largest MF that we manage. Everything else is a range and it is probably another 80 properties.

[IF NO]

b. Have you or your company owned or managed market-rate properties in the past?

Project 1	dk
Project 2	n/a
Project 3	n/a
Project 4	no
Project 5	no
Project 6	n/a
Project 7	n/a

Marketing/Awareness

5. How did you hear about the program? [INTERVIEWER NOTE: ENSURE ANSWERS ARE CAREFULLY DETAILED TO UNDERSTAND SUCCESSFUL OUTREACH METHODS]

Project 1	Rater: [RATER][RATER] reached out to them

Project 2	Through rater, [RATER] [RATER]who TCACT (tax credit) CDLAC (bonds)-have to be at least 15% more energy efficient
Project 3	Do a lot of work in the MF Green commission. CA housing partnership; multifamily green coalition (it is like a peer member organization that we give input about getting more access to energy retrofits and greening for multiple projects; regional). So we have been keeping up to date with the goings on at the CPUC and the Energy Commission. So that and the California Housing Partnership also has been giving input. So I have been involved a little bit in the process and kind of in the development of the project. So that is how I have learned about it
Project 4	Does not remember, but may have been through rater with whom they had an existing relationship or through implementation staff directly
Project 5	Was forwarded an email about the program from someone within his company and was told to look into it.
Project 6	either through word of mouth or probably was through (rater)
Project 7	Word of mouth: Owner client to the management company went through the SF program in Sacramento and he recommended it. Then the MF pilot became available. Now going back and wrapping up SF.

6. What professional associations or organizations do you belong to?
   Probe:
   Associations:
   --Building Owners and Managers Association (BOMA)
   --International Facility Managers Association (IFMA)
   --National Association of Real Estate Investment Managers (NAREIM)
   --National Association of Real Estate Investment Trusts (NAREIT)
   -Associated General Contractors

Project 1	Affordable housing coalition's umbrella groups (Non-profit Housing Association of Northern CA NPH of No. CA); California Coalition for Rural Housing California Housing Consortium EBHO – East Bay Housing Organization Housing California Housing Leadership Council of San Mateo County Housing Partnership Network Housing Trust of Santa Clara County

	NAHMA – National Affordable Housing Management Association National Housing Trust Non-Profit Housing Association of Northern California Silicon Valley Leadership Group
Project 2	multifamily conferences through different trade associations. National Multifamily Housing Conference is another one.
Project 3	NP housing, NPH, California Housing Partnership is a company but they are how we get a lot of our greening information and they lobby on our behalf; We are members of ULI and other national organizations for affordable housing;
Project 4	Non-Profit Housing Association of Northern California; http://www.nonprofithousing.org/
Project 5	dna
Project 6	Anyone who teaches EE. E.g., Mark Jewell's Efficiency Sales Professional course
Project 7	The State and Local CA Apartment Association. The Association of Realtors. California Bar. LEED.

7. How do you think more property managers and owners could be made aware of the program?

Project 1	Would recommend reaching out to people in the finance community; Most of these rehabs and repositioning's or opportunities to use this program happen at a time where financing is coming into a project. Look on affordable housing developer's websites for their projects and it will list all of the people who contributed funding to development. A lot are the same from project to project: like Bank of America, Union Bank, Citibank. All of the major banks. State Housing Finance organizations such as CA Housing Finance Agency, the State Department of Housing Community Development.
Project 2	TCACT, CDLAC,
Project 3	Through industry publications—magazine called affordable housing finance (but national); presenting at NPH (non-profit housing association of northern California) conference in SF every year; For Market-rate: DK
Project 4	DK
Project 5	dna
Project 6	dna

Project 7	Maybe through advertising PG&E phone; contractors reaching out

Decision-Making

8. How many people were directly involved in the decision to participate in the program?

Project 1	4
Project 2	3
Project 3	2
Project 4	6
Project 5	dna
Project 6	1
Project 7	11

a. Were you the main decision-maker?

Project 1	yes
Project 2	yes
Project 3	yes
Project 4	yes
Project 5	Dna-but seemed to be
Project 6	no
Project 7	no

b. Could you describe others' roles in the decision-making?
   i. What were their titles or functions?

Project 1	Reached a consensus among: 1. project administrator-presented program to respondent 2.direct supervisor 3.director of real estate
Project 2	Principal and director of construction: 2 main concerns: what would be additional cost to meet requirements; and then 2) paperwork, all the documents; very problematic; very one sided for PG&E. almost didn't participate because of how one-sided it was.
Project 3	Supervisor-signed off
Project 4	Resident manager-interface tenants and help evaluate tenant burden vs. benefit

	Construction manager-interface with GC see if scope of work, see that GC can complete work Director of real estate- CFO-whether it was financially feasible Others- Had to consider how much effort would it take and would it distract from renovation project happening at the same time
Project 5	dna
Project 6	But we're just not looking at simple payback we're looking at lifecycle costs and other factors instead of just looking at a simple metric like simple payback. So we work in conjunction with the architects here as the Arcadia Group, we're all in the same office. And then I have a team of we'll call them energy engineers and analysts to perform all the analysis on the systems.
Project 7	2 members form the management company advise and consult; 9-member owner board decides.

9. Why did you (and others) decide to participate in the program?

Project 1	Planning to do the energy improvements anyway; already started the energy rehab work (started 1/2013); basically a reward for work we were already doing. were undergoing renovations to qualify for the CTCAC tax credit
Project 2	Money; were already going to be making renovation; money allowed extra upgrades to take place. were undergoing renovations to qualify for the CTCAC tax credit
Project 3	Was already aware of the program; happened to be offered at the right time for the development and renovation. , I had a background of already working on some of the development aspects of the pilot program. So I was just participating from that point of view. But also it was offered at the right time for my project. So the pilot was only a yearlong thing and development and renovation works takes a lot longer than that. So when they were looking we really had to have a property that was already scoped and ready to go to get it completed within the time frame. So we would have liked to participate more with our other project but they were not far enough along to meet the pilot's timeframe

	were undergoing renovations to qualify for the CTCAC tax credit
Project 4	Already disrupting tenants through an existing renovation; would be beneficial to tenants; already had a contractor involved; were undergoing renovations to qualify for the CTCAC tax credit
Project 5	The money. Very interested in bringing green into the property. Thought it would be easy to participate in it. (was already doing rehab). Were NOT undergoing renovations to qualify for the CTCAC tax credit
Project 6	Another Revenue stream were undergoing renovations to qualify for the CTCAC tax credit
Project 7	Was older property—wanted to rehab property anyway; reduced expenses by participating in the program Were NOT undergoing renovations to qualify for the CTCAC tax credit

a. What were the most important reasons for your decision?

Project 1	Incentive reward, user-friendly; were able to use their own GC
Project 2	Money; were already going to be making renovation; money allowed extra upgrades to take place
Project 3	Timing; I liked how the rebate structure was set up. That it was just paid out based on the modeled EE and that we didn't have to test out every single unit after we were done. I think it fit well within the financing structure as well. We didn't have to commit to any other loans or try to get permission from any of our investors because of the rebate structure.
Project 4	Tenant benefit: comfort, aesthetic: windows.
Project 5	The money. Very interested in bringing green into the property. Thought it would be easy to participate in it.
Project 6	Revenue stream for EE work
Project 7	Cost savings

b. What were the most compelling features of the program?

Project 1	Incentive reward, user-friendly; were able to use their GC-put a lot put a lot into relationship with GC and so would not want to pick from a random list of people. Were able to get general contractor certified and that was a big plus for the program. A bit of paperwork but worth it.
Project 2	Money; were already going to be making renovation; money allowed extra upgrades to take place
Project 3	Timing; I liked how the rebate structure was set up. That it was just paid out based on the modeled EE and that we didn't have to test out every single unit after we were done. I think it fit well within the financing structure as well. We didn't have to commit to any other loans or try to get permission from any of our investors because of the rebate structure.
Project 4	The incentives made it much easier; the significant energy savings that would result; implementation staff's hand-holding/shepherding
Project 5	The money. Very interested in bringing green into the property. Thought it would be easy to participate in it.
Project 6	Revenue stream for EE work
Project 7	Cost savings; by tying performance to rebate amount, the program insures that contractor work is actually contributing to energy savings

10. What were the biggest obstacles you had to get past before deciding to participate in the program?

Project 1	her questions re: verification process and its impacts on tenants what does the verification process entail? what percentage of units do you need to get in? Could they get into the units for verification before people move back? once people have moved back into the units it's difficult on property management to give notice. wanted to make sure that the inspections occurred while the units were uninhabited. Time-how much time is devoted to this program; Vetting the user-friendly ; getting GC signed up on board
Project 2	2 main concerns: what would be additional cost to meet requirements; contractor indemnity-
Project 3	Contractor had some issues with legal documentation; some issue with background checks on themselves and subs

	I liked the fact that they were able to be certified. Like I was saying, we would not have gone with this program if we couldn't have used the same contractor that was doing the renovation also the employees of their subs. And that is not out practice in our industry to run background checks on everybody. I mean we have construction projects that have hundreds of people working on them and subcontractors that are reporting to the General Contractor but they don't… the General Contractor does not hire the subcontractor's employees. So it is pretty onerous.
Project 4	Clarify or verify how much savings/incentive would result from the upgrades and participation in the program
Project 5	At first using program-approved rater; He thought that there was an inherent conflict of interest between what the rater would be paid and how much EE retrofit work would take place. Then discovered he could sign-up the rater he had used in the past and was satisfied the rater would not build in extra work.
Project 6	Just the upfront costs of the third party rater and the combustion safety testing. Just the initial costs to do the test in's and test out's
Project 7	Figuring out how to set up the contract with the contractor. Everything seemed negotiable with contractor so have to do research to make sure that they are paying and being charged a fair market price. Solved the problem by agreeing to pay the contractor a set price per unit and then the contractor reaped any (higher) performance-based rebate money

11. Do you have a protocol or criteria that govern property improvement decisions? If so, could you describe the protocol or criteria?

Project 1	The mission is to provide long term affordable housing that is sustainable from both environmental perspective and an economic perspective; basis for all decisions; leads them to pursue the type of energy upgrades impact on the environment and the bottom line in terms of operations.
Project 2	No; case by case; very property-specific; what needs to be long-term investment.
Project 3	Yes; but wide range of renovations. Properties at the 15 years, do a physical needs assessments. Newer ones: useful life issues—boilers after 10 years; appliances

	15 year renovations to qualify for tax syndication and always do energy assessments at these times.
Project 4	Financing; The company is in two parts: 1) repair/management and 2) development; the repair/management operates short term and development operates 15-20 as a syndicated tax credit; typical tax credits-after 15 years and buy out the investors;
Project 5	dna
Project 6	Ultimately it's governed by our tax credit application. And then also internal policies here at Hampstead to obviously increase net operating income and improve tenant comfort
Project 7	look at health and safety, building code, the HUD handbook; also the goals and objectives of maintaining and raising the quality of life for the residents

a. What kinds of improvements are highest priority?

Project 1	financial and environmental
Project 2	Case by case; very property-specific; what needs to be long-term investment.
Project 3	15 year: generally get a physical needs assessment done by an architect or another consultant like [RATER][RATER]. And we will see what recommendations they make and fold those in. We generally do destructive testing at our properties to get an idea of what the scope needs to be 10 year: mostly useful life issues
Project 4	"Shell improvements" Roof, exterior sidings, windows for water-proofing; appliances and floor coverings
Project 5	dna
Project 6	lighting, heating and cooling
Project 7	look at health and safety, building code, the HUD handbook; also the goals and objectives of maintaining and raising the quality of life for the residents

b. Where do energy efficiency improvements fall?

Project 1	At top because it helps lower operating costs and the financing sources in affordable housing impose certain energy efficiency metrics; extremely competitive and get additional for committing to certain percentage

	improvements; varies from source to source, but generally more likely to get funding if planning to do energy upgrades.
Project 2	It depends; 10 years ago, much lower ranked, but (green) becoming bigger priority from monetary perspective and good for residents. Lowers utility bills for tenants; community pride in; too early to tell on the comfort side
Project 3	If it is something like EE then we are always worried about bottom line because our rents are restricted. And it helps us by getting these rebates to keep property energy costs low. Then we are able to keep the rents lower for the residents as well.
Project 4	DK but the improvements triggered by the development are usually comprehensive and any EE is a byproduct
Project 5	Dna-but mentioned "green" as an important driver to participate
Project 6	Energy efficiency is on the forefront of everybody's mind because ultimately it keeps – it reduces costs over the life of the property and the life of the system.
Project 7	Near the bottom. Utility bill is not much of a concern to the tenant. The tenant is already heavily subsidized and has no incentive to keep from running the AC all day. (e.g., they only pay 30% of their rent to begin with and maybe $15 in utilities regardless.)

c. How does energy efficiency compare to aesthetic improvements?

Project 1	EE Usually trumps aesthetic because of connection to environmental and financial criteria but if curb appeal is really bad—will focus on that.
Project 2	dna
Project 3	EE are more important;
Project 4	Low to medium consideration; tenant has a utility allowance; if an utility analysis says that they can get by with lower EE then may do EE since this would save money; all money comes out of owners pocket
Project 5	dna
Project 6	Hand in hand
Project 7	At the same level

d. What role does ROI play in these decisions?

Project 1	Return-on-investment is something they think about but not in the same way a market-rate apartment community manager does. Do not have a goal to make money, instead goal is to control costs and direct the limited dollars to the best use.
Project 2	dna
Project 3	Yes we do but because these properties are restricted and they generally have a lot of… I don't know if you are familiar with the term, soft debt. So they may have 5 or 6 levels of funding on them and many times we have to repay the funding from cash flow. So we are repaying loans to localities with any of that cash flow. So we don't really…non-profit housing or de-restricted housing doesn't look at ROI the same way as market-rate people might
Project 4	For Maintenance/Repair ROI helps sets priority of EE measures. Go for those with highest returns; Investors are looking at total rehab budget, not paying attention to EE. Investors are looking at a 3rd party inspection—attach inspection to tax credit application. Then present to investor and ask if want to invest. Looks at budget to see that it will cover the project
Project 5	dna
Project 6	dna
Project 7	In a subsidized environment so ROI only in the sense that they have a fixed budget for reserved dollars to improve the property. If they leverage those dollars and get farther that is a wise economical use of the dollar.

i. What is the max ROI limit?

Project 1	Payback period depends on property, but 10-15 years is good
Project 2	n/a
Project 3	n/a
Project 4	Doesn't know.
Project 5	n/a
Project 6	n/a
Project 7	dna

[ASK IF ONLY A PORTION OF THE PROPERTY'S UNITS WERE UPGRADED THROUGH THE PROGRAM]

12. Why weren't all the units at this property upgraded?

Project 1	n/a
Project 2	Because program limited
Project 3	n/a
Project 4	(also participated in SF because some units were 4 or less)
Project 5	n/a
Project 6	Some qualified for SF
Project 7	The remaining 86 were in 4-plexes and duplexes, therefore qualifying for the SF components.

[ASK ALL]

13. Are you considering participating in this program again in the future? Why or why not?

Project 1	Would consider it but impact on tenants; lots of parties involved and the communication between them was lacking sometime-- needs to be a point person. Also need a schedule to stick to. ;. Each step: step one assessment date, verification date
Project 2	Yes; for doing some more at property since all the forms are signed-thought would require more testing; but maybe for other properties too—have to go back to original questions: How much are we doing and what are the additional costs and what are the benefits? How many units can we get into the program?
Project 3	Yes; always looking for sources of funds; 50 properties in NC
Project 4	Yes; Very good benefits. Helps the tenant and the earth; hopes that it will be better/smoother second time around.
Project 5	Dna-but other properties he manages do fall in the non-profit AH 15 year tax-write-off investment cycles.
Project 6	Yes; revenue, program has good structure, and the program guidelines make sense
Project 7	Potentially; open to it. Program/contractor communication was strained—expectations changed mid stream perhaps because of the pilot nature.

14. What is the normal frequency or time frame for completing renovations or maintenance overhauls in your building(s)?
    Probe:
    -A set cycle (e.g., 10 or 15 years)?
    -Only out of necessary?
    -Only when the unit is unoccupied – to avoid tenant interruptions?

Project 1	for projects that have tax credits the initial compliance period is 15 years before buying out the limited partner investor. that is often a time where new financing comes into a project and it works out that it is a good time to do some rehab work. And then typically 15 years later if you re-syndicate. But also dependent on when refinancing is done
Project 2	This project took about 2 years to complete. AH: Most projects however are1 year long project; generally every 10 or every 15; don't get a rent increase. MR: once every 5 or 10; It depends on its current status and what it needs. Can increase rent.
Project 3	15 year:
Project 4	Maintenance as needed; renovations every 15-20 years
Project 5	dna
Project 6	15 year:
Project 7	dna

15. How much lead time would you need in order to review program information and offerings before deciding to work with a PG&E program that was supportive of the energy efficiency aspects of your maintenance or renovation process? (E.g., 1 year in advance? 6 months? Less?)

Project 1	1 month
Project 2	Couple of weeks to talk with our construction crew. not about lead-time, more about whether scope is developed your scope or not
Project 3	Anywhere between 1 to 2 years depending on if it is going to be a major renovation then we have a lot of different sources of funds we have to line up. But if it is more of a stand-alone EE thing then we could probably get it done in a year
Project 4	3 months
Project 5	dna
Project 6	It depends where we are in a development timeline and when our properties close. But ultimately when the principles are looking at acquiring new property we try to get in right away and look at utility bills and do an energy analysis to see what kind of shape the property is in and what kind of improvements we can make; week to month: If you're going to reduce your energy consumption by 25% you're going to get $1200 per unit. They're easy calculations to make what we do is we put an energy tab together in our pro forma and we've got all the systems listed in there. And so

	we give the system cost, what are rebate is, what the net costs will be. And so there are inputs and outputs that we look at and so that could take us a week to do or if the scope is constantly changing we're constantly changing our energy tab and that could take months. And you've got to understand in these takedowns of these properties it's a long cycle. It's not like buying a single family residence and coming and making a contract and have a 30 day close and you get your single loan from the bank. With low income housing you've got to go through the tax credit process application, you've got to wait for the award, you've got to get equity partners, you've got to get lighter debt inside of there. So it's a long process that changes frequently. M: And are there points in the process where the program is better suited to market itself or to do outreach? R: Yes I think in the due diligence stage with developers is the really the good time to get in.
Project 7	Depends on how significant changes were;

[ASK IF MANAGE/OWN MARKET-RATE PROPERTIES]

16. Would you consider enrolling the market-rate properties you own/mange in the program? Why or why not?

Project 1	n/a
Project 2	Yes depends on needs of property/project
Project 3	n/a
Project 4	n/a
Project 5	n/a
Project 6	n/a
Project 7	yes

17. Is there a different decision-making process at market-rate properties for committing to projects like your recent upgrade?

Project 1	n/a
Project 2	Not really different; case by case
Project 3	Maybe
Project 4	n/a
Project 5	n/a
Project 6	n/a

Project 7	Yes

[IF YES]

a. How is it different? What decision makers does the program need to account for?

Project 1	n/a
Project 2	n/a
Project 3	thinks aesthetic considerations might trump EE ones at MR properties because it is not the market-rate model where an investor may buy and hold a property for 5 or 7 years and then cash out on the appreciation of the property. I think the aesthetic improvements would be more important to that kind of model
Project 4	n/a
Project 5	n/a
Project 6	n/a
Project 7	EE makes the tenant more comfortable and have lower utilities. This helps to retain the tenant, but it does not help attract tenants.

b. How might the timeline for making a decision to participate in this program be different for market-rate property project from the decision-making timeline for your project?

Project 1	n/a
Project 2	dna
Project 3	n/a
Project 4	n/a
Project 5	n/a
Project 6	n/a
Project 7	Timing has a lot to do with budgets and reserves; build up reserves over time and have residuals; depends on what you have budgeted and what other capital expenditures there are, e.g., roof before an EE upgrade of windows and ducting.

c. Is the decision making process for a market-rate program longer – or shorter than for an affordable housing property?

Project 1	n/a
Project 2	dna
Project 3	n/a

Project 4	n/a
Project 5	n/a
Project 6	n/a
Project 7	9 person board (AH) vs. 1 property owner; profit vs. quality of life

Program Processes

18. How would you describe your experience participating in the program? What makes you say this?

Project 1	All in all "satisfactory"; got a lot out of it but more challenges; thought it was going to be a smooth process but it didn't end up as smooth as first thought. Met expectations because tried to not get expectations too high to begin with
Project 2	Other than the PG&E legal documentation (indemnification completely unnecessary contractor because contractor identified owner as the responsible party), the program was great,smooth and simple.; if any resident called and said there was a problem; no give and take—not a party to a construction; implementation staff manager was phenomenal
Project 3	It was o.k.. I think that there could be some more clarity provided as far as how the program works and what exactly is being tested and how the models are being run. That process didn't flow that well. Part of it I think was because it was new to [RATER] as well. They didn't exactly know what the final product that they were going to have to provide would be for gaining the rebate. I think that is my main comment. I think also that working with the implementation staff helped a lot. We were also working with California Housing Partnership as well. So it was… I know we were supposed to have a one-stop shop but it was helpful to me to have an organization that I already worked with in the past helping us work this through.
Project 4	Pretty good; I made it through and got an incentive. Increased appreciation for energy rater who had to deal with the program administratively
Project 5	Dna, but had the expectation that it was going to be more tedious than it actually was. Knew it was a pilot and that there would be hiccups

Project 6	It's been excellent. (implementation manager) and the others I think (implementation technical lead) that I've been dealing with their instant communication, intelligible answers, they stick to deadlines and frankly they've given us a little bit of wiggle room as far as a deadline meaning like I was supposed to have something to them by Tuesday and I get it to them on Wednesday or Thursday it doesn't drop me out of the program which is great.
Project 7	Beneficial, great concept, cumbersome, administratively burdensome, confusing, frustrating,

a. Which steps took longer or were more complicated than you expected? Please explain.

Project 1	Verification; had to verify both phase 1 and phase 2 units which was not clear initially; this added cost, delayed schedule and made it so tenants were again occupying units during verification; implementation staff, PG&E, and rater all had to be there. Difficult to get all three parties and so added stress to the process.
Project 2	The test-outs and modeling took a long time because the program requires both PG&E and the rater to test some things; seemed redundant to have both parties there.
Project 3	Not too onerous; Both test in and out. Level of testing—having to go into every unit; The issue I was talking about before with [RATER] doing the model and they went back and forth about what model would get us to what rebate level. And they ended up saying that they had to spend a lot more time and money on it than they had previously expected. So we ended up getting a $4000 additional services invoice because of them spending extra time on it
Project 4	Clarifying how to qualify the contractor. The big thing was they had to sign some paperwork saying would not hire contractor/employer sexual predator/DUI. Couldn't see how it was connected to implementing EE. Seemed an overkill. Shared requirements with contractors and subcontractors who had to make some personnel changes. Confusion between SF and MF; contractor wasn't on MF list.
Project 5	They weren't able to do a proper test-in so they had to use assumed values. Appreciates that implementation staff and PG&E worked with him on this.
Project 6	No, pretty easy;

Project 7	Sign 2 hours' worth of paper-one for each unit,--would be great if there was a master signing form developed. The application and actual receipt of the upgrade incentive. Not 6-8 weeks but actually a lot longer. DK if long wait was applicable to contractor or PG&E behemoth. Contractor went in on relying on predicable schedule but wasn't there impacted schedule and tenants.

b. Was the paperwork or application at any one step more complicated or take longer than you expected? Please explain.

Project 1	No; typical, but took a while to get to the final agreement draft.
Project 2	No it was fine
Project 3	No-used to working with government level paperwork
Project 4	Clarifying how to qualify the contractor. The big thing was they had to sign some paperwork saying would not hire contractor/employer sexual predator/DUI. Couldn't see how it was connected to implementing EE. Seemed an overkill. Shared requirements with contractors and subcontractors who had to make some personnel changes. Confusion between SF and MF; contractor wasn't on MF list.
Project 5	dna
Project 6	no
Project 7	The application and actual receipt of the upgrade incentive. Not 6-8 weeks but actually a lot longer. Applicable to contractor or PG&E behemoth. Contractor went in on relying on predicable schedule but wasn't there impacted schedule and tenants Sign 2 hours' worth of paper-one for each unit,. Master agreement

c. Thinking about the participation process overall, would you say it exceeded, met or did not meet your expectations?

Project 1	met
Project 2	Met-knew it was a pilot and there would be some kinks
Project 3	met
Project 4	Exceeded expectations.

	Thought it would be more time consuming and challenging than it turned it about. Paid rater more and the paperwork went faster. The incentive was about what we expected. Less-than expected-incentive per software calculation
Project 5	Dna, but can infer from the sat rating of 10 and the level of expectation prior for a pilot, that it probably exceeded expectations. Expected some hiccups and kinks due to pilot but they weren't that bad.
Project 6	Exceeded—The main thing about this program that differs from the other programs is that you can get hold of somebody; you can ask questions, you get definitive answers. Instead of worrying about a program cycle that's ending especially in our business where the sale cycle is long we sometimes run into a situation where program funds expire and then we're left holding the bag until the next cycle comes around
Project 7	Did not overall meet expectations. But not criticism PG&E. Would still have participated in the pilot.

19. What were the main benefits of participating in this program?

Project 1	Finances; helpful; getting to know other organizations (raters); tenants are happy with the cosmetic changes;
Project 2	Rebates; helped leverage other projects; were already doing a lot of energy efficiency.
Project 3	we were already planning on doing the energy upgrades and that we were able to capture the rebates for it
Project 4	Helped tenant and the earth
Project 5	Incentives and greening the property
Project 6	Revenues, good communication with the implementation, everything was verified tested in/tested out which is a good check on the construction and energy rater work
Project 7	The aesthetic improvements, the functional improvements, the HVAC upgrades adding more ducts; locking, dual paned, tenants feel more comfortable, cost savings

20. Based upon the benefits that you (your building) realized from participating in the program, what messages promoting the program to other building owners like yourself would you recommend be utilized?

Project 1	Use case studies with amount received.
Project 2	it was really a no additional cost benefit, especially for AH properties.
Project 3	"It is a relatively painless way to access these rebates and apply them to EE."
Project 4	Messages: if another project manager. Gave us a good incentive; real money; rater took care of the administration. It may look intimidating to complete at the get go, but didn't end up that way for me; recommend energy rater that has participated before. (Noticed that rater understood more over time. Very happy
Project 5	dna
Project 6	Whether you like it or not you're going to have to embrace energy efficiency so you might as well start doing it now. (coming from property owner)
Project 7	you have the potential to participate in the program that can save you 30 cents on the dollar potentially and reduce energy costs but also raise the quality of life for residents through these upgrades

[ASK IF MANAGE/OWN MARKET-RATE PROPERTIES]

a. What messaging would be best for market-rate property owners or managers?

Project 1	n/a
Project 2	If you are already considering doing a major rehab, it would be foolish not to participate in this program because it provides incentives for the energy efficiency Title 24 already requires. It's a no cost benefit
Project 3	I think that they might be more responsive to a message that would say it is something they could apply to energy improvements and then use that as their marketing materials. Because I think (prospective tenants) are responding to environmental concerns.
Project 4	n/a
Project 5	n/a
Project 6	n/a
Project 7	advertise, highly efficient unit, low utility bills

21. Thinking about the sequence of steps from enrollment, to assessment and scope of work, to assessment incentive request, to retrofit, verification and upgrade incentive request, to upgrade incentive payment, can you make any suggestions for how these steps should be improved?

Project 1	a lot of parties involved and didn't always feel like they were communicating effectively with each other. improve that process so someone is the point person keeps others updated; also for each project there should be a clear schedule laid out incorporating each of the steps and possible timing contingencies.
Project 2	Overall time frame will probably get shortened. Why do PG&E and rater both have check the same thing (maybe for CAS)?
Project 3	Longer lead time; frame as something to fold in; rebates I think really thinking of this as something you can fold in with other financing sources is a good way to think about it. I think you can get to deeper energy retrofits that way because the rebates, while they are nice they certainly don't cover the entire cost of doing the improvement. So many of these projects, because they are affordable, because of the funding they have on them they have restricted uses of their cash. So it is not always something we can just decide to do and cover the rest of the cost if something is not covered by the rebate. So as long of a lead time as possible would be really helpful
Project 4	Have people triple check the need for every piece of documentation they are asking for. The model is a bit of a black box—would be more interested in seeing what's in it.
Project 5	During test out, allow for a grace period/window for the CAS test. Wants to install appliances last for security and construction scheduling reasons.
Project 6	Nothing noticeable stood out of place. It was a logical progression that was easy to follow.
Project 7	Yes—concept of service id, every building has a separate service ID. Neither owner nor contractor knew about the service ID and SF or MF rebates are tied to service ids. In order to receive rebates, contractors have to complete work in one service ID building in a time. Contractor did not understand this and expected to get rebates after each measure type installation across service IDs. Contractor ran into cash flow problems and the owner had to restructure milestone payment agreements.

22. How did participating in this program affect your tenants or residents?

Project 1	Mostly on a cosmetic level, expect bill savings and some comfort too. Units were unoccupied at time of construction but not at the time of verification: The tenants were out of their units for about three months.
Project 2	Some units were occupied, some were not. Fortunately none of the water heaters are in the units. Noticing and walking through the unit is disruptive.
Project 3	Indifferent—already doing the renovations; they are indifferent to it because we were already doing renovations. So I don't think they thought anything different. M: Were all the units occupied during the time of the renovation? R: Yes they were.
Project 4	They'll have lower bills; have more complex equipment at first humistat bathroom fans—there is a transition figuring things out. Maybe 10 interruptions to the tenants over half a year.
Project 5	dna
Project 6	they have a nice cleaner environment, they've got lower utility expenses (expected) and happier tenants stay longer. When you deal with unhappy tenants you are looking at greater expenses on a monthly basis. Putting an ad in the paper for the apartment, cleanup, having it sit vacant possibly for a month. So there is a tremendous amount of fiscal advantages to keeping your tenants happy.
Project 7	Pros: comfort and functional benefits (e.g., working windows, functioning HVAC systems); Cons: disruptions and inconvenience to tenants

a. Were there any issues?

Project 1	Yes-multiple noticing and entrances into the units
Project 2	no
Project 3	no
Project 4	Not really but do wear them out a bit-so not as accommodating—some have noticed utility bills are lower, but bathfan complaints are there too
Project 5	dna
Project 6	no
Project 7	The lack of immediate access to the units: Contractor did not manage the project schedule well and so tenants were informed about in-unit repair taking off works and then no

	one came into a their units. 72 hours notice requirement meant that re-scheduling was not ideal. Multiple noticing. Coming down to lack of a savvy contractor.

b. Did you consult with them at all before the assessment and upgrades took place?

Project 1	yes
Project 2	Yes-provided them notice
Project 3	No-only noticing them
Project 4	yes
Project 5	dna
Project 6	No- I think we did a pretty good job of informing all the tenants of what was going on and that was part of relocation efforts during the rehabilitation. So all of this was done during – while either the tenant was gone during the day or they were relocated for 3, 4 or 5 days to other housing while the entire unit or units were rehabbed.
Project 7	Yes-provided them notice that there were improvements (windows, ducts or insulation). Tenants don't care about these last two, but do care about windows. then the multiple notices: because not finishing all that stuff was a challenge

c. How do you think your tenants will benefit from the upgrades that took place?

Project 1	Cosmetic upgrades, expect that bills will fo down
Project 2	Lower bills; pride in more sustainable community
Project 3	Lower bills; "greening property"-raising awareness; probably more comfortable too.
Project 4	Lower bills
Project 5	dna
Project 6	they have a nice cleaner environment, they've got lower utility expenses (expected) and happier tenants stay longer. When you deal with unhappy tenants you are looking at greater expenses on a monthly basis. Putting an ad in the paper for the apartment, cleanup, having it sit vacant possibly for a month. So there is a tremendous amount of fiscal advantages to keeping your tenants happy.
Project 7	Pros: comfort and functional benefits (e.g., working windows, functioning HVAC sytems);

23. What do you think of the steps the program takes to ensure safety? Please explain your answer.

Project 1	reasonable
Project 2	dna
Project 3	It's good for combustion safety
Project 4	Irrelevant-already have construction tape, already oversee contractors during rehabs
Project 5	dna
Project 6	Declined to answer
Project 7	DK—not aware of them. Relying on contractor for safety. Sliding door may perform ok but threshold might trip someone up.

a. Did any Combustion appliance safety issues emerge during assessment or test out on any of your projects?

Project 1	Yes; minor-leaks in a gas line-pg&e came to fix. No in-unit CAS appliances but there are common area CAS appliances-gas fired water boiler; some of the pipes needed to be insulated.
Project 2	Not sure
Project 3	no
Project 4	Rater identified a few stove ranges and one new WH spewing out carbon monoxide—had to shut down—immediately fixed
Project 5	Only in so far as the appliances had to be installed before test out, which was not optimal for the construction schedule.
Project 6	Yes, minor ones insulation in the wrong place; And this happened to be by the way even on portions of the property that weren't even touched.
Project 7	Yes; there were issues of stove and in-unit water heaters outgassing

b. Who on the project team was responsible for dealing with and identifying these issues?

Project 1	owner coordinated all
Project 2	n/a
Project 3	n/a
Project 4	rater
Project 5	dna
Project 6	rater
Project 7	Contractor, but implementation staff found the problems

c. How were these issues resolved?

Project 1	PG&E had to come out
Project 2	n/a
Project 3	n/a
Project 4	Relatively smoothly
Project 5	dna
Project 6	Contractor fixed them.
Project 7	implementation staff identified problems; The contractor sealed the water heater closets. Some gas valves and flex lines had to be changed.

d. How did these issues impact the projects?

Project 1	Didn't add a huge amount of cost. Time, and coordination. Found out about verification late in the process
Project 2	n/a
Project 3	n/a
Project 4	Tenants without water for a few hours
Project 5	dna
Project 6	In a minor way
Project 7	Worked stopped and there were 4 tenants without hot water for the weekend

e. Do you have any suggestions for how the program might modify its Combustion appliance safety protocols?

Project 1	have been wary of CAS on past projects because you could not have someone in that unit if there is a CAS issues. Difficult for property management and owner of housing. Didn't have any in-unit CAS appliances, but could see how they probably would not do it on a building that had in-unit CAS appliances because of the risk. Can also can be extra cost. should do a more detailed assessment upfront when it is easier to make CAS changes and not during verification
Project 2	Why do both program staff and PG&E have to check CAS
Project 3	dna

Project 4	no
Project 5	Give a grace window for when the CAS testing is done and let respondent schedule it according to construction schedule.
Project 6	no
Project 7	communicate so that the owner can have eyes wide open to know that there are potential for other things that will need to be addressed; Talk about CAS ahead of time

Satisfaction

24. Considering all aspects of your participation in this program, including any benefits as well as any issues, how would you rate your overall satisfaction with the program? Please use a scale where 0 means 'not satisfied at all' and 10 means 'completely satisfied'. Why do you give this answer?

	Rating	Reason
Project 1	7	Received incentives, tenant burden
Project 2	8	Because of indemnification lowered the sat score, otherwise would have given 9.5 or 10.
Project 3	8	As programs go it was a fairly easy program to use. The rebate process itself was fairly easy. I think the (short time frame) could have been better and I think just understanding the process a little bit more and what was expected would have helped we had to get the project enrolled and tested and had to have everything wrapped by December. So once we found out about it, it took a couple of months to get everything enrolled and then we had basically 6 months to work on it and be done and completed and tested out and modeled. So it was way too compressed of a timeframe
Project 4	7	Pro-good return for the effort primarily for the tenant and the earth; con-some of the administrative requirements were unclear—comparing SF and MF (also participated in SF because some units were 4 or less)
Project 5	10	completely satisfied. maxed out the program.
Project 6	9	Pros: Nearly everything Cons: Make incentives higher
Project 7	6	Pros: cost savings, comfort, function, aesthetic, upgrading an old building, 40 year old building; Cons: a program-approved not so savvy contractor; absence of CAS zone, managing tenant and noticing; managing everyone expectations better. Everybody loved the units. Majority still positive.

25. Now I am going to ask about your satisfaction with a few aspects of the program. Using a scale where 0 means 'not satisfied at all' and 10 means 'completely satisfied', how would you rate your satisfaction with:
    a. The professionalism of the program implementer Build It Green. For this question, please consider such things as responsiveness, follow-up, answering questions and technical support.

Project 1	7
Project 2	9- Implementation manager was phenomenal-- oversaw our progress the whole way through, was very helpful and very clear.
Project 3	10
Project 4	7
Project 5	dna
Project 6	10
Project 7	7

i. (if less than 7, why do you give that rating)

Project 1	n/a
Project 2	n/a
Project 3	n/a
Project 4	n/a
Project 5	n/a
Project 6	n/a
Project 7	n/a

    b. The information provided by the program. For this question, please consider such things as how valuable, informative, clear and relevant the information was to you.

Project 1	8
Project 2	9
Project 3	8
Project 4	7
Project 5	dna
Project 6	10
Project 7	4

i. What was provided?

Project 1	Program brochure, all the agreements
Project 2	PPTs with implementation staff
Project 3	Sat through PPT with implementation staff; were provided with contract documents
Project 4	Through implementation staff phone meeting, program documents
Project 5	dna
Project 6	webinars; we placed conference calls with the team and multiple informational emails back and forth.
Project 7	The only thing that was provided was information from the contractor.

ii. (if less than 7, why do you give that rating)

Project 1	n/a
Project 2	n/a
Project 3	n/a
Project 4	n/a
Project 5	n/a
Project 6	n/a
Project 7	Should have been some consulting with implementation staff. There was nobody who could track an issue down.

26. Before participating in this program, did you talk with anyone at PG&E about the different multifamily programs available to property managers and owners?

Project 1	no
Project 2	no
Project 3	yes
Project 4	no
Project 5	dna
Project 6	yes
Project 7	Yes-conference call

[IF YES]

a. What did you think of this experience?
Probe:

-How informative, valuable, straightforward etc. was it?

Project 1	n/a
Project 2	n/a
Project 3	It was helpful—helped clarify
Project 4	n/a
Project 5	n/a
Project 6	Can't recall it.
Project 7	-helped to explain MF requirements

b. Do you have any suggestions for how to improve this service?

Project 1	n/a
Project 2	n/a
Project 3	I think maybe even a matrix or table something like that, that shows what the programs are and what you could qualify for. Just laying it out in a more clear fashion and talking about which ones are compatible and not
Project 4	n/a
Project 5	n/a
Project 6	It would be great if all information could be found on one web page.
Project 7	no

Working with the Energy Rater

Now I have a few questions about the energy rater you worked with.

27. Using a scale where 0 means 'not satisfied at all' and 10 means 'completely satisfied', how satisfied were you with your energy rater? Please explain your rating.
Probe for:
--whether the rater's findings were valuable and relevant
--confidence in the rater's skills and expertise
--how well rater worked/communicated with owner(s), site personnel, and contractors

	Rating	Reason
Project 1	7	Pros: proactively reached out to us; done a lot of homework on the program; and generally had a pretty good knowledge of what they had to do. Cons: didn't catch certain CAS issues in the assessment and did in the verification. the protocol shifted as things were going along so it was not all their fault but ended up spending more

	Rating	Reason
		money; bit of a coordination problem; spreading blame between implementation staff, PG&E and rater.
Project 2	8	Con: the communication between PG&E and implementation staff and rater, communication chain broken
Project 3	7	Pro: familiarity with our projects: They are somebody that we work with pretty often. So they are familiar with our projects. That was definitely a plus. I had already had an energy assessment done by the company for our TCAC application for the tax credit. So it made sense to use them as a rater. We already planned on using them as a rater for the TCAC purposes too. Con: I think they could have communicated with us a little bit more. Like I said, that modeling thing at the end caught us by surprise and we got charged for it
Project 4	9.5	Pro: navigated the administrative side of things, they know the impact of making a retrofit; were very helpful in prioritizing measures in context of costs and savings. Good intuitive side which measures get best bang for buck. Con: The rater might have been more up to date on requirements. Could have been due to the unformed nature of the pilot
Project 5	10	Have an existing relationship with the rater and the rater did a good job
Project 6	10	Job well done; good communication; knows what they're doing, main to a deadline, does not break our bank; Giovanni and Johanna they're extremely knowledgeable.
Project 7	9	Negotiated a fee, did the test-in, did the test-out, smooth; did what he said he was going to do; met expectations

28. How did the rater present the results of the assessment to you?

Project 1	report
Project 2	Paper report;
Project 3	orally
Project 4	Don't remember
Project 5	Sat down over a report
Project 6	ECON test out and also a report, energy models and a narrative
Project 7	Just received results over the phone; did not receive a report

a. Did you read the report?

Project 1	yes
Project 2	yes
Project 3	n/a
Project 4	Don't remember
Project 5	no
Project 6	yes
Project 7	Didn't receive a report

b. What parts of the presentation/report were the most important for you?

Project 1	Since we'd already done an assessment; didn't feel like it was new information but good to confirm that the decisions were making for the upgrades were good ones.
Project 2	Only cared about the end percent. Rater walked respondent through rest of report but respondent didn't care.
Project 3	Which savings level had been met
Project 4	n/a
Project 5	dna
Project 6	Confirming the reductions verifying what we had forecasted; Just confirming the energy reduction whether it's kilowatt hours or therms. That's really the most important to us. Ultimately the savings percentage that fall into it
Project 7	n/a-because he felt it was more important for the contractor to see.

c. What would you like to have heard or seen more about in the presentation/report?

Project 1	Issue with the timing: by the time they got the report decisions on the measures have already been made. helpful if early on in a project
Project 2	no
Project 3	In some way that I could understand because this energy stuff is kind of new to us. It is not really our main focus of work. So I think it needs to be very clear and basic and non-technical
Project 4	n/a
Project 5	dna
Project 6	nothing
Project 7	See below

d. Can you make any suggestions for how to modify the report/presentation to better inform energy upgrade decisions?

Project 1	Issue with the timing: by the time they got the report decisions on the measures have already been made. helpful if early on in a project
Project 2	no
Project 3	
Project 4	Even though can't remember: I would like something that clearly spells out the tradeoffs of costs vs. savings and relationship to comfort. Also in terms of overall budget. Save automatic/canned report for the end of the presentation/report.
Project 5	Distill it down as much as possible to the best/most important courses of action. Provide an Executive Summary. Show improvements metrics.
Project 6	no
Project 7	Show the before and after efficiency and how it translates into monthly utility bill savings; Same with health and safety: counts of carbon monoxide before and after the retrofit.

29. Do you think there were significant energy savings opportunities on the [PROPERTY NAME] that the assessment missed or significantly undervalued? If so, please explain.

Project 1	no
Project 2	no
Project 3	no
Project 4	no
Project 5	dna
Project 6	no
Project 7	dna

Working with the Contractor

30. Using a scale where 0 means 'not satisfied at all' and 10 means 'completely satisfied', how satisfied were you with your contractor(s)? Please explain your rating.
Probe for:
--the quality of the contractors' work
-- Contractor professionalism

	Rating	Reason
Project 1	8	Pros: They completed project on time and on budget Cons: Inherent in rehab world, things come up that you don't expect. generally they were great in those moments but also times maybe they didn't handle it that well.
Project 2	10	
Project 3	8	Pro: they are an experienced contractor that we have used on other large renovation projects. So it was important in participating in this program that we could use that contractor. Especially because they were already doing the big renovation piece. It would have been difficult to divide the energy upgrade piece from the rest of the contract. So if we had been forced to use a direct installer or a contractor that was chosen by PG&E that would have been a reason for us to not participate in the program at all Con: got behind schedule
Project 4	6	Pro: work quality was good and trust we got what we paid for; Con: very disorganized and administratively challenged
Project 5	10	Pro: Used a contractor he had used in the past and that was working on the ongoing rehab.
Project 6	8	Pros: Cons: communication could have improved.
Project 7	Declined to state	

31. Generally, do you use the same contractors you've worked with in the past no matter what kind of work needs to be done, or do you often hire new contractors?

Project 1	usually use same set contractors, but still have to bid
Project 2	usually don't hire new contractors. don't always use the same exact one but have a pool that they pick from
Project 3	The same ones
Project 4	A bit of both; 80% with same set of general contractors
Project 5	dna
Project 6	Depends on the area; one of the contractors used usually is the GC
Project 7	Use different contractors for different projects. Required to bid things out for HUD; for this project HUD allowed sole-source because not many contractors had been approved by implementation staff but should have gone through 3-bid process; use different contractors for different projects (e.g., roof)

a. For this project, did you use a contractor you've worked with in the past or did you use a new contractor?

Project 1	past
Project 2	Used in the past
Project 3	Used in the past
Project 4	New contractor
Project 5	Worked with in the past
Project 6	One of each; Lyon was partner; Alton
Project 7	First time used this contractor.

[IF YES]

b. How did you find your contractor for this project?

Project 1	developed a relationship with them long before respondent worked here.
Project 2	Used in the past
Project 3	n/a
Project 4	Through referrals from MF community who have gone through a rehab
Project 5	Used in the past
Project 6	Have a long relationship with them
Project 7	Contractor approached the property owner who saw that they were a program-approved contractor.

c. Do you have any suggestions for making the selection of contractors easier for future participants?

Project 1	n/a
Project 2	n/a
Project 3	n/a
Project 4	Look at list of Certified BPI contractors
Project 5	n/a
Project 6	n/a
Project 7	dna

32. What do you think of the certifications or eligibility requirements the program has for contractors who want to participate in the program?

Project 1	Defer to GC
Project 2	Bad- PG&E's contractor indemnification was completely one sided and unnecessary because contractor indemnified owner of the project for anything that went wrong. In the case of a gas leak that was not the contractors fault, the contractor could get sued for millions. There was no protection for them and so hard for them to sign.
Project 3	some issue with background checks on themselves and subs also the employees of their subs. And that is not out practice in our industry to run background checks on everybody. I mean we have construction projects that have hundreds of people working on them and subcontractors that are reporting to the General Contractor but they don't… the General Contractor does not hire the subcontractor's employees. So it is pretty onerous.
Project 4	Overly strict (see above). Don't see the connection between DUI and EE installation and sexual predation is not likely in a MF setting when property personnel are present with contractors in units.
Project 5	dna
Project 6	It would be great if all utilities had the same standard
Project 7	dna

a. Are there any certifications or requirements that should be adjusted or changed? If so, why?

Project 1	n/a
Project 2	Yes, get rid of PG&E's legal indemnification language against rater
Project 3	Should not be responsible for background checking the subs
Project 4	Yes; get rid of DUI/sexual criminal part
Project 5	dna
Project 6	It would be great if all utilities had the same standard
Project 7	dna

Incentive Levels

33. You received [INSERT ASSESSMENT INCENTIVE] as an incentive for having an energy assessment of [NUMBER OF UNITS] completed. What do you think of the assessment incentive?

Project 1	Great reward for doing the right thing; made participation worth it.

Project 2	Very helpful
Project 3	$8,000; fair
Project 4	Very nice; helpful
Project 5	dna
Project 6	It's great,
Project 7	See above. It was hard for them to understand how to view the incentive level so, as it was performance-based, they paid the contractor a flat, per-unit fee and let the contractor collect the rebate dollars on top of that.

a. How much did it influence your decision to participate in the program?

Project 1	A lot
Project 2	A lot
Project 3	It would have if I hadn't already have gotten the other energy assessment. I wish that the pilot program could have used the one we already had completed. But it couldn't.
Project 4	150%! Keep that incentive! It was really big.
Project 5	dna
Project 6	It was part of the decision-making absolutely and that is something that we seek out on other programs to see if there is an energy audit required can we get funding for it.
Project 7	dna

b. About what percentage of the assessment do you think the incentive covered?

Project 1	dna
Project 2	70%
Project 3	50%
Project 4	About 50%
Project 5	dna
Project 6	80%
Project 7	dna

c. If the assessment incentive had been smaller, would you still have had an assessment completed?

Project 1	dna
Project 2	Probably not
Project 3	yes

Project 4	possibly
Project 5	dna
Project 6	Yes because of CTCAC
Project 7	dna

i. [IF YES] How low of an upgrade incentive would have been acceptable to you [ACCEPT ANSWER IN TERMS OF DOLLARS OR PERCENT OF ASSESSMENT]

Project 1	n/a
Project 2	n/a
Project 3	For future projects is about 50%
Project 4	$9,000
Project 5	dna
Project 6	Hard to answer; have to look at the Performa; maybe no incentive.
Project 7	dna

34. You received [INSERT UPGRADE INCENTIVE] as an incentive for the energy upgrades that improved [NUMBER OF UNITS] of your units. What do you think of the upgrade incentive?

Project 1	Great reward for doing the right thing; made participation worth it.
Project 2	really happy
Project 3	It was good
Project 4	Seemed pretty good
Project 5	dna
Project 6	Great, best game in town
Project 7	dna

a. How much did it influence your decision to participate in the program?

Project 1	A lot
Project 2	dna
Project 3	No influence (n/a?) Like I said, we were already going forward with all of the upgrades. So basically a pretty low incentive would have been ok. But in a stand-alone project I think covering about 50% of the cost is as low as feasible in order to do these.
Project 4	It was everything; I wouldn't have done it without it.
Project 5	dna
Project 6	Strongly influenced—however, would have been more influential and encouraging if the incentives increased exponentially.

Project 7	dna but probably somewhat. they were already doing a rehab—the incentives help defray costs. But the performance structure offered some assurance that the contractor would do quality work.

b. About what percentage of the total upgrade project do you think the incentive covered?

Project 1	dna
Project 2	dna
Project 3	$62K/6M~ 1%
Project 4	DK
Project 5	dna
Project 6	20%
Project 7	dna

c. If the upgrade incentive had been fewer dollars, would you still have had an upgrade completed?

Project 1	yes
Project 2	dna
Project 3	yes
Project 4	n/a
Project 5	dna
Project 6	Some but not all
Project 7	Dna, but probably because they were already doing a rehab—the incentives help defray costs.

i. [IF YES] How low of an upgrade incentive would have been acceptable to you [ACCEPT ANSWER IN TERMS OF DOLLARS OR PERCENT OF ASSESSMENT]

Project 1	dna
Project 2	n/a
Project 3	In a stand alone project need at least 50%
Project 4	n/a
Project 5	dna
Project 6	dna
Project 7	dna

ESA Participation

35. Did you participate in PG&E's ESA (Energy Savings Assistance) program? [IF NECESSARY: Pacific Gas and Electric Company's (PG&E's) Energy Savings Assistance Program provides income-qualified renters with easy, free solutions to help manage their energy use and save money on their monthly energy bills, including compact fluorescent lights, caulking, and showerheads; replacement of old refrigerators, furnace and/or water heaters; and energy saving tips.]

Project 1	No
Project 2	no
Project 3	No
Project 4	Yes has participated in the past with very good results. Can't say how recently.
Project 5	Not sure
Project 6	no
Project 7	no

[IF NO]

a. Are you aware of ESA? If yes, why did you not participate in ESA?

Project 1	no
Project 2	no
Project 3	and I also think the ESA plan, I think they also require a different income verification of all the residents. That is not something we do. Because we do our own income eligibility just because of the requirements of the financing of the properties. So it is not extra work that is generally worth it for us, to get the income verifications for the PG&E program
Project 4	Was not aware of it at first, but after description, yes
Project 5	no
Project 6	Tenant initiated
Project 7	No; but based on description it may have happened at the property in the past in the past.

[IF YES]

b. How would you describe your experience participating in the two programs?

Project 1	n/a
Project 2	n/a
Project 3	n/a
Project 4	dna
Project 5	n/a
Project 6	n/a

Project 7	n/a

c. Is there anything that could be done to improve the programs to make it easier for property owners to participate in both?

Project 1	n/a
Project 2	n/a
Project 3	n/a
Project 4	dna
Project 5	n/a
Project 6	n/a
Project 7	n/a

Financing and Tax Credits

36. Will you receive tax credits for this energy efficiency upgrade project?

Project 1	yes
Project 2	yes
Project 3	Yes
Project 4	yes
Project 5	DK
Project 6	yes
Project 7	no

[ASK IF WILL RECEIVE TAX CREDITS]

37. Please describe the tax credits that you will receive?

Project 1	CTCAC
Project 2	CTCAC
Project 3	CTCAC
Project 4	CTCAC http://www.treasurer.ca.gov/ctcac/ LIHTC The California Tax Credit Allocation Committee (CTCAC) administers the federal and state Low-Income Housing Tax Credit Programs. Both programs were created to encourage private investment in affordable rental housing for households meeting certain income requirements.
Project 5	n/a
Project 6	CTCAC

Project 7	n/a

[ASK ALL]

38. Have you or will you receive any other grants or financial assistance for completing this upgrade project?
    a. If so, which ones?

Project 1	dna
Project 2	Yes, CDLAC
Project 3	private bank loan; private bank loan for the first mortgage. Like you said the equity that came in. But besides the tax credit we also have federal energy tax credits because we installed a solar PV system. And there was existing debt on the property that we assumed. So it is mortgaged through the Department of Housing and Community Development that remained on the project
Project 4	no
Project 5	Yes; California Development Block Grant and HOME
Project 6	Just solar/MASH
Project 7	dna

39. Did you have access to financing for this project?

Project 1	yes
Project 2	Just the tax credits
Project 3	yes
Project 4	Yes
Project 5	yes
Project 6	yes
Project 7	yes

[IF YES, ASK] Did you use the financing?

Project 1	dna, but Implied yes
Project 2	n/a
Project 3	yes
Project 4	Yes;
Project 5	yes
Project 6	Yes,
Project 7	no

[ASK IF HAD ACCESS TO FINANCING]

40. Could you describe the financing products that you had access to?

Probe:

--Who was the lender?
--What were the loan limits?
--What's the interest rate?
--What is the term of the loan?
--Is it specifically for energy efficiency improvements?

Project 1	Bank of America, Union Bank, Citibank. All of the major banks. State Housing Finance organizations such as CA Housing Finance Agency, the State Department of Housing Community Development.
Project 2	n/a
Project 3	private bank loan for the first mortgage
Project 4	Conventional construction loan: Wells Fargo, 3%, $4M, 12 months, for whole rehab
Project 5	Yes; California Development Block Grant and HOME
Project 6	was leveraged through the lending on the property in conjunction with low income housing tax credits
Project 7	1) Through bank by taking some sort of equity line out on the property to get it;

a. Did you learn about any of these through the program?

Project 1	no
Project 2	no
Project 3	no
Project 4	no
Project 5	dna
Project 6	dna
Project 7	no

[ASK IF HAD NO ACCESS TO FINANCING]

41. Had you had access to financing what terms would be acceptable?

Project 1	n/a
Project 2	n/a
Project 3	n/a

Project 4	n/a
Project 5	n/a
Project 6	n/a
Project 7	n/a

a. Are there any terms that would be deal breakers and would cause you not to use financing?

Project 1	n/a
Project 2	n/a
Project 3	n/a
Project 4	n/a
Project 5	n/a
Project 6	n/a
Project 7	n/a

42. PG&E is considering an on-bill financing option in which the utility would provide financing for the project based on the expected bill savings resulting from the upgrades. Participants would pay the loan installments as line items on their monthly utility bill. What do you think of an on-bill financing option from PG&E?

Project 1	likes the sound of it, good idea but would need more info
Project 2	Could be interesting. Might complicate the tax credit benefit; maybe better for market-rate.
Project 3	Great idea if you have bill neutrality; So as my energy bill is normally $50 I would expect to continue paying $50
Project 4	Don't have an opinion. Property and asset managers would have an opinion
Project 5	Would have to see it on paper, but generally does not like the idea because he would like to see the loan and the utilities kept separate. Would be difficult to explain to others why the utilities (with the loan payment) was higher at one property than at another. It would complicate his budget.
Project 6	Great idea for MR; but very difficult for AH because utility ; master-metered, because of utility allowance; no incentive I think it's a great idea for a market-rate and single family homes. I think it would be very difficult for people to buy into that, owners to buy into that, and try to control their tenants' behavior in the affordable housing vertical Because there are utility allowances like take for instance maybe a master meter or a – in a master meter project – are you talking about master meter projects? It's very hard to get the tenants to keep their windows closed when the air-conditioning is on, to turn their lights off when they leave their place and the same in the wintertime close their window when the heat is

	on or turn the heat off when you leave the house. And there is a lot of environmental and – what's the other factor that I'm looking for? M: Conservation behavior kind of.
Project 7	Interesting—likes the idea of paying it over time and the energy savings pays for it; depends on the position of the owner—how capitalized they are; depends whether there would be any financing charges;

a. What terms would be necessary for you to consider using this product?

Project 1	dna
Project 2	Make sure that PG&E is reasonable with its terms (unlike the indemnification); the term would have to be long enough to feel comfortable that the savings would outweigh the cost of the loan.
Project 3	bill neutrality; So as my energy bill is normally $50 I would expect to continue paying $50
Project 4	n/a
Project 5	dna
Project 6	Would not
Project 7	If there was no access to funds (i.e., the building had an exhausted reserve and couldn't get financing from a bank), then would consider the PG&E financing option; If the PG&E rate beat the bank rate, then would use the PG&E rate.

[ASK ALL]

43. Did program staff provide you with any information on financing products for energy efficiency upgrade projects?

Project 1	no
Project 2	no
Project 3	no
Project 4	no
Project 5	dna
Project 6	No that I recall;
Project 7	no

[IF YES, ASK]:

a. What products did you learn about?

Project 1	n/a
Project 2	n/a
Project 3	n/a
Project 4	n/a
Project 5	dna
Project 6	n/a
Project 7	n/a

b. Did you use any of these products for your project? Why or why not?

Project 1	n/a
Project 2	n/a
Project 3	n/a
Project 4	n/a
Project 5	dna
Project 6	n/a
Project 7	n/a

c. What were the most compelling features across these products?

Project 1	n/a
Project 2	n/a
Project 3	n/a
Project 4	n/a
Project 5	dna
Project 6	n/a
Project 7	n/a

d. Were there any features that would cause you not to use any of the products?

Project 1	n/a
Project 2	n/a
Project 3	n/a
Project 4	n/a
Project 5	dna
Project 6	n/a
Project 7	n/a

Program Improvement

44. Can you think of any ways to improve the program that would make participating in it go more smoothly for property owners/managers like you?

Project 1	a lot of parties involved and didn't always feel like they were communicating effectively with each other. Improve that process so someone is the point person keeps others updated; also for each project there should be a clear schedule laid out incorporating each of the steps and possible timing contingencies.
Project 2	no
Project 3	no
Project 4	Nothing additional (see above)
Project 5	Provide a grace period for the CAS testing. Gas had to be turned off for an extended period of time to complete test out.
Project 6	The program worked very well. Keep Build It Green as the program administrator. Implementation manager and technical lead did a fantastic job.
Project 7	no

45. Were there any energy efficiency measures that you wanted to include in your project but that did NOT qualify for the program? If yes, what were those?

Project 1	dna
Project 2	Were interested in solar and low-flush toilets
Project 3	I don't think windows qualified. I think that they should. I think water saving measures should be included because that goes along with greening and is a large cost saver for the property
Project 4	no
Project 5	dna
Project 6	no
Project 7	Maybe building siding

46. The program is looking to work more with market-rate properties in 2014. Do you have any recommendations for the program to help it encourage more market-rate properties to make energy efficiency upgrades?

Project 1	dna
Project 2	Have to be economical; maybe on-bill financing would work.
Project 3	no

Project 4	Talk to private investor to learn what ROI they are looking for. Clarify owner savings vs. tenant savings.
Project 5	dna
Project 6	I would say the biggest thing probably is the financing mechanism. I think that is the biggest barrier to entry.
Project 7	helping them to appreciate the anticipated savings so managing agents and property owners can calculate out the benefits in terms of numbers

Closing

47. Is there anything else you believe is important for me to know about the program based on the conversation we've had today?

Project 1	no
Project 2	Overall fairly simple process, communication between all parties was good.
Project 3	no
Project 4	no
Project 5	dna
Project 6	Reiterate again how great the implementation staff was.
Project 7	no

48. If in looking over my notes, I need to clarify a point, may I contact you again for a quick follow-up question or two?

Project 1	yes
Project 2	yes
Project 3	yes
Project 4	yes
Project 5	Yes-email
Project 6	Yes.
Project 7	yes

On behalf of PG&E and the Energy Upgrade California Multifamily Pilot Program, thank you for your time.

G. PARTICIPATING RATER DATA TABLES

Permission to Use Quotes

This interview is part of an evaluation study. All transcripts will remain in confidence with the evaluation team. We would like to use quotes without names in our reporting to directly share participant experience. However, it is possible that even without a name, you could be identified through other information such as the project's name or characteristics. With this in mind, may we use direct quotes from this interview without identifying you by name or do you prefer that we not use quotes from this interview?

Note: throughout "dna" stands for did not ask. This was used in situations in which there was not have enough time to complete a full interview or it was used in cases where the interview content suggested that the question would not be relevant to the participant.

Project 1	Rater 1	Ok to record and to use quotes
Project 2		
Project 3		
Project 4	Rater 2	Ok to record and use quotes
Project 5	Rater 3	Ok to record, Don't use quotes
Project 6	Rater 4	Ok to record ok to use quotes.
Project 7	Rater 5	Ok to record; Did not get permission to use quotes.

Rater Overview

1. Could you describe your professional background?
    a. What credentials/certifications do you have?
    Probe for: HERS II, RESNET, BPI (Multifamily Building and Building, Certified Energy Plans Examiner (CEPE), etc.

Project 1	Rater 1	Mechanical Engineer, LEED AP, CEPE, HERS II, GreenPoint Rater, BPI Proctor
Project 2		
Project 3		
Project 4	Rater 2	HERS II, BPI MF&SF, CEPE, Commissioning, LEED background
Project 5	Rater 3	HERS I, infrared thermography level 2 building envelop BPI, RESNET certification for a rater. EEM Mortgages, ENERGY STAR® Partner of the year BIG green point rater, DOE builder challenge houses, CEPE, HERS II multifamily, HERS II blower door
Project 6	Rater 4	Several: HERS II multi, BPI multi, BIG multi, LEED, HERS

Project 7	Rater 5	Originally in corporate sales: NC dried up so developer and rater became involved in HERS rating in 2008. HERS II MF; lot of experience; BPI analyst BA, MF

b. Do you know whether any of your training was supported through ARRA (American Reinvestment and Recovery Act) or utility (PG&E, SCE or SDG&E) funding? If so, please explain.

Project 1	Rater 1	Probably some of it was; as a trainer, salary was ARRA-funded
Project 2		
Project 3		
Project 4	Rater 2	Yes-attended subsidized California Building Performance Contractors Association (CBPCA) training for himself and staff, may have been utility funded; BPI MF, Green Building retrofit program, LISC MF retrofit,
Project 5	Rater 3	Yes, probably both
Project 6	Rater 4	Absolutely; The initial BPI certification for building analysts were all ARRA funded; 2 main raters have spent about 50 hours each at the PEC; SDG&E sponsored, Mark Jewell's "energy efficiency sales for professionals"
Project 7	Rater 5	Not sure; did attend the PG&E/BIG-sponsored CAMFEB

c. How long have you been performing whole-building assessments?

Project 1	Rater 1	Since 2005
Project 2		
Project 3		
Project 4	Rater 2	15 years
Project 5	Rater 3	Since 2009
Project 6	Rater 4	2009
Project 7	Rater 5	Since late 2010

d. What types of buildings do you assess? Single family, multifamily, commercial, etc.?

Project 1	Rater 1	MF and commercial; multifamily is about 40-50% of our business if not more this year. It is really growing
Project 2		
Project 3		

Project 4	Rater 2	Most everything commercial, schools, NC; very few SF
Project 5	Rater 3	all
Project 6	Rater 4	Commercial-commissioning, single family, MF
Project 7	Rater 5	MF, SF, no commercial

e. In the last five years, about how many whole-building assessments of multifamily buildings have you completed, including any that you did before participating in the PG&E program?

Project 1	Rater 1	100's; Have a national presence and are allied with Partner Engineering
Project 2		
Project 3		
Project 4	Rater 2	30-40
Project 5	Rater 3	At least 100
Project 6	Rater 4	39 Buildings
Project 7	Rater 5	At least 100

2. How long have you been working in the multifamily sector?

Project 1	Rater 1	2009
Project 2		
Project 3		
Project 4	Rater 2	Since ARRA funding program in 2008/9
Project 5	Rater 3	Since 1998
Project 6	Rater 4	Since 2009
Project 7	Rater 5	Since late 2010

a. What types of properties do you assess? Affordable housing? Market-rate?

Project 1	Rater 1	Both- We do market-rate as well. I see a little bit less push from that. You know the big market is from the tax credit financing… low income has to do it. Market-rate a lot of times they are not going to do it because they have to unless they are acquiring a building and they have to do it anyways
Project 2		
Project 3		
Project 4	Rater 2	Both, but only a few MR
Project 5	Rater 3	Mostly affordable housing.
Project 6	Rater 4	Mostly affordable housing. Our clients we deal predominantly with the real estate asset managers that I know are going to convert properties. In other words I

		don't generally try and do that business by going to a mom and pop
Project 7	Rater 5	both

b. Aside from whole-building assessments, what other sorts of projects have you completed in the multifamily sector before becoming a rater?

Project 1		
Project 2	Rater 1	dna
Project 3		
Project 4	Rater 2	All kinds of retrofits and past NC
Project 5	Rater 3	dna
Project 6	Rater 4	dna
Project 7	Rater 5	dna

c. Have you participated in another PG&E program – the Energy Upgrade California Whole House – also referred to as the "Home Upgrade" program?

Project 1		
Project 2	Rater 1	n/a
Project 3		
Project 4	Rater 2	Yes-mainly only for 2-4 unit MF buildings
Project 5	Rater 3	yes
Project 6	Rater 4	yes
Project 7	Rater 5	yes

[IF YES]

i. How many jobs as a rater have you completed in the EUC Home Upgrade program?

Project 1		
Project 2	Rater 1	n/a
Project 3		
Project 4	Rater 2	About a 1/3 of the project was a 2 to 4 unit program and about 2/3 was the MF. We have done a handful of assessments for SF projects but it just not our market
Project 5	Rater 3	As agency, 50-100
Project 6	Rater 4	65
Project 7	Rater 5	100+ statewide

3. [FOR EACH PROJECT ASK:]
    a. Did you have an existing business relationship with [INSERT PROPERTY OWNER] before you began the [INSERT PROPERTY NAME] project?

Project 1	Rater 1	yes
Project 2	Rater 1	yes
Project 3	Rater 1	yes
Project 4	Rater 2	yes
Project 5	Rater 3	yes
Project 6	Rater 4	Yes; [Oakland] is something that we do with a client that we've got like eight or nine properties in flow for this particular client right now, so it's a client that we know pretty well and we knew about the test in for C-Tac before we knew about the test in for the EUC program.
Project 7	Rater 5	somewhat

    b. Who on the [INSERT PROPERTY NAME] team first knew about the Multifamily Whole-building Program and the available incentives? Was it yourself, the contractor the owner or someone else?

Project 1	Rater 1	rater
Project 2	Rater 1	Rater
Project 3	Rater 1	rater
Project 4	Rater 2	The owner
Project 5	Rater 3	The owner
Project 6	Rater 4	Energy rater, Learned about at the MF CAMFEB
Project 7	Rater 5	Contractor brought the program to the owner; was doing SF extended it to MF

Program Processes

4. How would you describe your experience participating in the program? What makes you say this?

Probe for:
--Did your participation go as you expected?
--Did anything surprising occur?

Project 1	Rater 1	Overall was a success with a few hiccups related to 1)
Project 2		the pilot phase. E.g., clients would ask about

Project 3		verification/test out and the protocols had not been created yet; PG&E would not sign off on CAS issues due to their own hold ups. Currently, hard to sell a program that has not been defined for the coming year. Sometimes we were on the phone for hours on wait with PG&E to call CAS issues in. They would respond to it and we would try to track them down. We are expecting to get paid by PG&E. PG&E is telling us they can't pay us until the diagnostic testing has had its corrections. Well they are the ones doing the corrections; it's the guy down the hall from them. So I feel like there was a little bit of conflict of interest where it was like, basically if you don't want to pay us, you just won't respond to what we call in. Appreciated how practical (implementation staff technical lead) Dryden was; does not miss point of the program by rules. Flexibility and communication were key (technical lead) , Sean, and (implementation staff) . (not hard or dogmatic about schedule and rules); flexibility—WH does not need to be as big as it was—accepted omitting WH; fan energy
Project 4	Rater 2	For the most part, especially in a pilot, as few surprises as possible is good. Overall good. But there were a few idiosyncrasies related to energy modeling—technical disagreements with the (implicit) program guidelines but overall ok. Not significant technical differences so the back and forth just wasted time. Not in the program guidelines at the time. … eventually we were able to resolve any issues that we did come up with in a timely fashion so that it did not impact the overall progress of our projects. I think everything went as well as I could expect given that this was a new program, ... So you have to take that into account when you are participating in something new and just say, be ready for changes through the process.
Project 5	Rater 3	Great; rushed by timing of the pilot; first rater's existing calculations inaccurate,
Project 6	Rater 4	Overall good—the program is bringing clarity to CAS testing which is important
Project 7	Rater 5	Generally positive. Had to remember that's it still a pilot so there are a lot of things still being worked out. Felt that assessment rebate was held up by the pilot

		process. Some miscommunication with implementation staff but trust their technical judgment. Had issues around the rebate processing. Some difficulty working with tenants who were exhausted by frequent entrances. Need to streamline the information submission. Sug: Maybe use a secure portal instead of email. Rater inputs necessary data, administrator checks it and then authorizes to generate an incentive. Sug: need to make sure that the rebate can be signed over to the rater

5. How would you describe working with the program implementation team: Build it Green?

Probe for:
-- Adequate level of communication
-- Adequate level of coordination
-- Adequate level of technical support
-- Professionalism

Project 1 Project 2 Project 3	Rater 1	Great relationship but sometimes was left out of loop on email with owner which undermined the raters central project role (implementation technical lead) is very practical and the program is not too dogmatic. So there was flexibility that allowed energy savings to take place using less conventional approaches (e.g., energy fans, omitting every other oversized WH for the modeling)
Project 4	Rater 2	Very amendable; in general the team was good to work with. Staff changed during the pilot: 2 or 3 people were replaced. Other staff seemed unaware of program requirements.
Project 5	Rater 3	(implementation technical lead) was superb, one of the smartest energy analysts I have ever seen; she and her people are very accommodating; (implementation manager) was fabulous
Project 6	Rater 4	In the dark about how program is deciding to admit one property in and another not; Potential client needs to know how likely they are to be enrolled Test out was great; explained what was necessary for test out. On another project-more than a couple of weeks before knowing whether or not it could participate

Project 7	Rater 5	Some miscommunication with implementation staff though trusts their technical judgment. Staff turnover created an information vacuum for several weeks. To the extent possible, believes that implementer should be in a collaborative role as opposed to and authoritarian or policing role since this increases collegiality and avoids giving owners the impression that EE professionals are doing shoddy work.

6. Please think about what worked well in your communication with implementation staff.
    a. What communication channels worked well for submitting applications and documentation?

Project 1	Rater 1	Liked mix of communication and conference calls, email; But sometimes they communicating directly with client; May be an ongoing problem if client reaches out to implementation staff directly
Project 2		
Project 3		
Project 4	Rater 2	Via email; some calls as needed to accelerate requests
Project 5	Rater 3	By email worked fairly well; but low staffing levels; eventually return email and phone calls after a few days; ideally they would get back to you within 24 hours; Some staff were quicker to respond than others.
Project 6	Rater 4	On site QA test out was great
Project 7	Rater 5	Email-but should be portal based, Communication broke down when implementation staff turned over. Was done with assessment in September but no rebate check until just before Thanksgiving.

    b. What communication channels worked well for technical support and requirements?

Project 1	Rater 1	Mix of channels including phone, email, in-person etc.
Project 2		
Project 3		
Project 4	Rater 2	Via email; some calls as needed to accelerate requests
Project 5	Rater 3	Email is best way (suggested); telephone, in the field
Project 6	Rater 4	Email was great, responsive
Project 7	Rater 5	Phone and email

7. Did you communicate with the PG&E program management team?

Project 1	Rater 1	Yes
Project 2		
Project 3		
Project 4	Rater 2	Yes
Project 5	Rater 3	No
Project 6	Rater 4	No
Project 7	Rater 5	yes

[IF YES]

a. What were the reasons for your communication with the team?

Project 1	Rater 1	Communicated at the beginning to get initial information on the pilot
Project 2		
Project 3		
Project 4	Rater 2	Just at the beginning to screen the project
Project 5	Rater 3	n/a
Project 6	Rater 4	n/a
Project 7	Rater 5	Trying to track down assessment incentive

b. In terms of these reasons, what worked well during the communication process?

Project 1	Rater 1	Communicating by phone
Project 2		
Project 3		
Project 4	Rater 2	Communicating by phone
Project 5	Rater 3	n/a
Project 6	Rater 4	n/a
Project 7	Rater 5	phone

8. Thinking about the sequence of steps from property owner recruitment to assessment and scope of work, to assessment incentive request, to retrofit, verification and upgrade assessment request, to final completion, can you make any suggestions for how these steps should be improved?

Project 1	Rater 1	Some of the questions during the screening are too detailed—like what is the insulation currently in the walls—so should be uncovered in the audit. But not necessarily a sticking point
Project 2		
Project 3		

		CAS issue remediation can be inefficient when working with PG&E. wound up teaching implementation staff about CAS issues during a Field check HERCC committee report template-incredibly ambiguous-should tighten it up. Example of Ambiguous: table says qualifications-one person is unlikely to have all of them-so supposed to combine across people? Lots of room for interpretation. QC of report: critiqued number of units in one report section and not another
Project 4	Rater 2	Findings ways to help enroll and qualify contractors smoothly using a contractor-centered web portal and/or a contractor-specific FAQ Finding ways to incentivize contractors: the contractor just has to do more work. There is no incentive for them to do this. And that is why contractors are dragging their feet and don't want to register and don't want to check their subs. It is just more headache for them. Then they have to deal with us doing all the extra testing and going into the units. Then of course if we find a failed something then they have to fix it. What I am saying is there is nothing… even if it seems like they have to do more work they are going to resent it. We are actually technically doing all the work right? Then really if there are any problems it is normally the plumber or the HVAC contractor who has to fix it. It is not them. But they have to maintenance this process and there could be some extra overhead. That is all I am saying. I don't have any sympathy for them. I am just saying if you were trying to grow this program there might be a benefit to having an incentive at the successful completion of the EUC-MF program for the contractor. I was just thinking there might be a more willingness from the contractors to maybe bring some of their other projects into the program.
Project 5	Rater 3	No
Project 6	Rater 4	That the testing was done not by one of us but by an employee that is actually not with our company anymore.

Project 7	Rater 5	The applications should be automated through a portal as much as possible; owners should be aware that CAS test-out may require entrance into every unit

a. Were there any obstacles in the assessment work flow?

Project 1	Rater 1	no
Project 2	Rater 1	no
Project 3	Rater 1	no
Project 4	Rater 2	No; but took a little more time to add in the EUC requirements on top of the assessments they already provide their client
Project 5	Rater 3	no
Project 6	Rater 4	There are several I would say at least small to medium size issues that I had with this particular property. And I think factors that should be considered for all programs particularly in their time frame windows, an issue is the holidays. When it comes to between Thanksgiving and Christmas it is very difficult to wrap up a project or even initiate a project during that time window because everyone is doing their Thanksgiving meals. And their places are so clogged with presents and the Christmas tree and everything that getting into that unit and actually seeing, you know you've got to go tape off every duct and they're buried under different stuff and then you've got to put the ladder up to get to this one and you have to move the tree to get to it and you know what normally would take an hour and fifteen minutes can easily take four hours When you're dealing with low income affordable housing you often constraint with personnel availability which is that for entering a unit that is low income sometimes the property managers will be proactive and just - and create a timeframe that you are not allowed to enter before 10 o'clock because you have a high frequency of if people are home they're sleeping late
Project 7	Rater 5	The test-in was relatively easy.

b. Which steps took longer or were more complicated than you expected? Please explain.

Project 1 Project 2 Project 3	Rater 1	None-except CAS-see below
Project 4	Rater 2	Contractor dragged feet when it came to enrolling and qualifying.
Project 5	Rater 3	The first assessment done by another rater was done poorly and had to be redone.
Project 6	Rater 4	Test out was difficult due to Christmas timing. Apartments filled with decoration, so difficult to access vents.
Project 7	Rater 5	Applications and submissions; the test-out was difficult because tenants were exhausted by multiple entrances Receiving assessment incentive

c. Was the paperwork or application at any one step more complicated or did it take longer than you expected? Please explain.

Project 1 Project 2 Project 3	Rater 1	None-except CAS-see below; and therefore took a long time to get paid from the owner who was being paid from PG&E
Project 4	Rater 2	no
Project 5	Rater 3	no
Project 6	Rater 4	Only issue was to figure out how to document CAS. This was clarified on site with the Q/A team
Project 7	Rater 5	Yes the assessment incentive took a long time (multiple months) to process.

9. Did any safety concerns arise over the course of this project? If so, please describe how they were handled.
   Probe for:
   -- mold, lead, etc.

Project 1	Rater 1	no
Project 2	Rater 1	no
Project 3	Rater 1	no
Project 4	Rater 2	Yes-combustion safety-see below
Project 5	Rater 3	no

Project 6	Rater 4	No direct concerns; but security is an issue. Some of the AH units are rough and scary. In the units, there can be drugs and paraphernalia lying around.
Project 7	Rater 5	Yes (CAS); multiple gas line leaks on the property with several tenants smoking. In-unit hot water heater outgassing CO.

10. What do you think of the steps the program takes to ensure combustion appliance safety in particular? Please explain your answer.

Project 1 Project 2 Project 3	Rater 1	For testing in and testing out, PG&E guidelines for call-in are specific and detailed; But list is perhaps overly comprehensive. Really need to focus on some general items: (high CO in appliance, ambient CO in unit, spillage and draft) PG&E has clear guidelines for when they have to call in an issue. There are set procedures if there are issues. However, if there are issues, then working with GSR can be extremely slow and inefficient. CAS testing is painful and little to no energy savings – is a barrier to entry
Project 4	Rater 2	Overall important
Project 5	Rater 3	Generally, combustion safety is critical and should be overseen by a third party. Not safe enough.
Project 6	Rater 4	Over time, the unknowns around CAS may dissuade raters from pushing the programs to properties with a lot of gas appliances.
Project 7	Rater 5	Overall important; Has important health and safety ramifications for the tenants.

a. Did any Combustion appliance safety issues emerge during assessment or test out on any of your projects?

Project 1	Rater 1	yes
Project 2	Rater 1	yes
Project 3	Rater 1	yes
Project 4	Rater 2	yes
Project 5	Rater 3	no
Project 6	Rater 4	Yes: draft diverters were misaligned and there were maintenance issues based on the filter size

Project 7	Rater 5	Yes (see above) multiple gas line leaks and in-unit hot water heater

b. Who on the project team was responsible for dealing with and identifying these issues?

Project 1	Rater 1	rater
Project 2	Rater 1	rater
Project 3	Rater 1	rater
Project 4	Rater 2	rater
Project 5	Rater 3	n/a
Project 6	Rater 4	Contractors and Raters-but some miscommunication between them The contractor said I didn't touch it so I don't want to fix it because it's not my liability, so then it becomes well who is going to fix this because it has to be fixed because I've looked at it and I think it's incorrect
Project 7	Rater 5	Rater required to identify them; contractor required to fix them.

c. How were these issues resolved?

Project 1	Rater 1	For critical issues, typically PG&E which is good for owner since it is free; occasionally the contractor
Project 2	Rater 1	For critical issues, typically PG&E which is good for owner since it is free; occasionally the contractor
Project 3	Rater 1	For critical issues, typically PG&E which is good for owner since it is free; occasionally the contractor
Project 4	Rater 2	Through a combination of the rater, PG&E GSR technicians and implementation staff putting their heads together. We identified a few issues where (PG&E) helped us trouble shoot… like there was some grey areas on what you do when a stove fails a test. BPI says recommend repairs. But the PG&E protocol is not totally clear. So there were a few things that we were able to phone them and work through with them over the phone. And then also with implementation staff. So we came to a good conclusion that allowed us to keep moving forward on the project
Project 5	Rater 3	n/a
Project 6	Rater 4	By contractors and raters

Project 7	Rater 5	PG&E GSR technicians at first, but then contractor and owner's field staff teamed up to proactively test for and correct CAS issues.

d. How did these issues impact the jobs?

Project 1	Rater 1	Burned time and budget waiting on phone and coordinating meetings with PG&E GSR technicians
Project 2		
Project 3		
Project 4	Rater 2	Slowed the project down a bit but didn't affect it overall. Also one tenant was without hot water for a few days: while we were testing with the implementation staff and a technical person in attendance, they found a water heater that had a problem. It was pumping out Carbon Monoxide, which is a dangerous thing. It was not going into the residential unit. It was venting to the outside of the building. But it was the type of thing that basically necessitated shutting off that unit so that meant a tenant was without water heating for 3 or 4 days until a replacement or repair could be done. But that is unavoidable
Project 5	Rater 3	n/a
Project 6	Rater 4	Expanded the scope of work
Project 7	Rater 5	Did not ask

e. Do you have any suggestions for how the program might modify its Combustion appliance safety protocols to minimize impact on the project?

Probe for:

-- combustion safety issues require a visit from PG&E field staff

-- the ease of working with PG&E field staff and their schedules

Project 1	Rater 1	Immediate call in criteria is inconsistent with PG&E's lack of response. PG&E calls it emergency but wait times range from 10-45 minutes. In some cases, over reaction, minute gas leak could have been there for 20 years; PG&E says things call for immediate action, but aren't efficiently responsive. PG&E wants a call immediately by the person who found it; but rater doesn't want field person to do it since can be on hold
Project 2		
Project 3		

	10 to 45 minutes. Field CAS guy has to do 14 units in a day. Can't waste time on the phone GSR can only handle one issue at a time. Issues with incentives because CAS not fixed, can't pay you, but caught up on PG&E side. Some were immediate, some same day, schedule with renter, hard to coordinate follow-up visit with PG&E-very difficult to budget; typically PG&E fixes it. Cases in which project address don't exist in PG&E records Sug (start around 40:00): PG&E has SF policy, should adopt MF-specific response (asked for "homeowner" to be on site; only allowed one issue to be asked at a time) Sug: 20 or more units-will always be failures between 50 and 75% will likely have at least one failure—PG&E can you have a GSR technician in the area be on the standby; PG&E tech could follow Partner guy. Sug: Forward info electronically to the GSR Sug: Leave VM, then call us about when they are free I don't want to say they came to the program late but it was a timing issue that there already has to be a rehab. Some of them had already started the rehab so we hadn't done the test in. So it didn't come out until the test out. I think ideally if the program is long term where we can catch properties before construction then we do test in and they are aware of them. That way they can fix them and can budget them. They would know they are there. A lot of times it is tough to budget to fix it after construction is complete because the money is all spent. If it is a contractor problem then the contractor has already been paid and he is gone. The last thing he wants to do is come out and fix something. So I think the test in helps but it is a matter of catching the properties at the right time to make sure you can do the test in Make sure the rater is involved and make sure the right people at PG&E know to talk to each other down the hallway. Because that was a little frustrating. The owner is not going to pay us until they get the incentive from PG&E. Well PG&E won't pay until implementation staff tells them that all the diagnostic problems has been resolved. And well a lot of times it is a different division of PG&E that is resolving them and they are slow

Project 4	Rater 2	10% test in and 100% test out is fairly minimal and appropriate. PG&E was alright to work with. Once people understand that we are primarily looking for safety issues and to ensure that no unsafe conditions will be present once a project is done, which is a little scary. You want to make sure you followed all the rules and regulations. That is the one nice thing about this program and even the 2-4 unit program is they are really trying to convince people to go to entirely sealed systems where you are reducing the potential for failed combustion safety type zones.
Project 5	Rater 3	n/a
Project 6	Rater 4	Be clear as to what CAS issues contractors are responsible for fixing.
Project 7	Rater 5	Owners should be made aware that CAS test-out can be a long process.

11. Was the program clear in what was required and what would take place during test-out/ the Field Quality Control visit?

Project 1 Project 2 Project 3	Rater 1	Eventually yes: no CAS failures
Project 4	Rater 2	yes
Project 5	Rater 3	Yes; implementation staff set expectations early on and nothing surprising came up
Project 6	Rater 4	Yes, implementation staff QA joined on site
Project 7	Rater 5	yes

[IF NO]

a. Please explain what was not clear.

Project 1 Project 2 Project 3	Rater 1	(protocols were not yet in place)
Project 4	Rater 2	n/a
Project 5	Rater 3	n/a
Project 6	Rater 4	n/a
Project 7	Rater 5	n/a

12. Can you think of any ways to improve the program that would make participation go more smoothly for raters like you?

Project 1 Project 2 Project 3	Rater 1	Make sure that the CAZ diagnostic testing and resolution is clear; wasn't written down initially; protocols are evolving
Project 4	Rater 2	submission portal
Project 5	Rater 3	Should coordinate with TCAC to increase savings in the AH market. If you lower the utility bill for the occupant, they can afford to pay 7 to 10 dollars more a month in rent. Across multiple apartments, owners get more equity in their property. Raters should know the assumptions behind the software, such that actual energy savings are modeled. E.g., not knowing the assumptions will cause a rater to model duct leakage using total duct leakage not total duct leakage to the outside. Out of work CEPEs could be used for this.
Project 6	Rater 4	Okay I'm a person that will happily invest $50,000 to broadcast a PG&E program to the masses. If the program administers will be fair to me, in other words, when I bring a program, a property into that program I do not want the program manager to send every other rater on record notification that that rater has been brought into the program and that you guys can all place a bid on this one. Your program allows the property owner to sign a form that says when the rater incentive is actually paid it can be paid directly from the program administrator to the rater. (helps negate property owners from failing to pay raters)
Project 7	Rater 5	Rater portal for incentive applications

a. How can implementation staff help support you and your company in meeting project timelines and meeting program requirements?

Project 1 Project 2 Project 3	Rater 1	Rater forums/conference calls/sub groups
Project 4	Rater 2	implementation staff is responsive to rater/contractor schedule:

		They have been pretty responsive as far as when they wanted to come out and do testing the wanted to work around our schedule. I am going to ask that they continue to do that because our schedule is driven by the contractor's schedule. So especially on these projects where they have fixed timelines and stuff like that. In my experience with them implementation staff was pretty good about that.
Project 5	Rater 3	Can be open to feedback; host open forums to discuss issues
Project 6	Rater 4	dna
Project 7	Rater 5	Rater portal for incentive applications

b. Did the program polices or protocols conflict with policies or protocols for other programs?

Project 1	Rater 1	No
Project 2		
Project 3		
Project 4	Rater 2	Yes
Project 5	Rater 3	Not sure
Project 6	Rater 4	dna
Project 7	Rater 5	dna

[IF YES]

c. Please explain the conflicts.

Project 1	Rater 1	n/a
Project 2		
Project 3		
Project 4	Rater 2	blower door testing required for SF EUC but not EUC-MF
Project 5	Rater 3	n/a
Project 6	Rater 4	n/a
Project 7	Rater 5	n/a

13. Can you think of any ways to improve the program that would make participation go more smoothly for owners and contractors?

Project 1	Rater 1

Project 2 Project 3		Sometimes had to wait to approve contractors so project schedules would become delayed. Waiting on assessments payment because owner is waiting on incentive from PG&E
Project 4	Rater 2	For contractors, provide contractor-specific web page and portal
Project 5	Rater 3	No; should ask them through a forum
Project 6	Rater 4	Bring clarity to whose responsibility CAS issues are
Project 7	Rater 5	Set up expectations around CAS testing.

Working with Contractors

14. Did you bring the contractor to the project or was the contractor hired by the property owner or manager?

Project 1 Project 2 Project 3	Rater 1	Hired by owner
Project 4	Rater 2	Hired by the owner
Project 5	Rater 3	Hired by the owner
Project 6	Rater 4	Hired by the owner
Project 7	Rater 5	Hired by the owner

[IF RATER BROUGHT THE CONTRACTOR TO THE PROJECT, ASK]

a. What is the nature of your working relationship with this contractor?
Probe for:
--worked together on past projects
--existing partnership
--contractual relationship

Project 1 Project 2 Project 3	Rater 1	n/a
Project 4	Rater 2	n/a
Project 5	Rater 3	n/a
Project 6	Rater 4	n/a
Project 7	Rater 5	n/a

15. How was working with contractors and overseeing their work?

Project 1 Project 2 Project 3	Rater 1	Did not work too much with contractor
Project 4	Rater 2	Overall ok, but contractor dragged feet a little due to the program requirements and background checks
Project 5	Rater 3	The contractor did not understand CAS and was not familiar with the program. Had to educate them all along the way.
Project 6	Rater 4	And for this project when we started that process we had a lot of difficulty with the contractor because there are actually two different contractors working on that property. Combustion safety testing and the knowledge that a BPI building analyst would have for the project. There was cad testing for this property and we had to explain what needed to be done for it. For the single family side it requires that the contractor hire a BPI building analyst, have them on staff and have them understand that work skill. So there was so for the contractor to have that knowledge it would have made the process a lot easier because they would have under – if they would have had someone on staff who would have been able to see the issues with the water heaters and the furnaces and to understand how to correct those issues for the water heaters and furnaces instead of having us coming out there and trying to explain it to them. And then trying to explain how to correct it, so it would have so all of the triplicate inspections that had to occur for combustion safety testing and then failure and retesting and then Q/A viewing of all those corrections it would have made that whole process so much easier had the contractors had that knowledge in advance and taken on that responsibility. There was also issues because the cad testing was outside of the work scope of the contractors, so whenever we came up this water heater that was not upgraded, has a draft flue deficiency, someone had to fix it. The contractor said I didn't touch it so I don't want to fix it because it's not my liability, so then it becomes well who is going to fix this because it has to be fixed because I've looked at it and I think it's incorrect
Project 7	Rater 5	Had an existing relationship with the contractor on the SF side of the program.

a. Did any issues arise working with contractors?

Project 1		
Project 2	Rater 1	no
Project 3		
Project 4	Rater 2	no
Project 5	Rater 3	no
Project 6	Rater 4	Yes, Contractors did not understand CAS testing
Project 7	Rater 5	Contractor poor performance on the SF side began to erode owner faith on the MF project

16. Has your experience indicated, or do you expect there to be, any differences between working with contractors who have existing relationships with owners and contractors who don't? If so, please explain.

Project 1		
Project 2	Rater 1	It is always better for the property owner to come with their own contractor. More trust.
Project 3		
Project 4	Rater 2	Thinks owner criteria for contractors should include willingness to participate in the program
Project 5	Rater 3	dna
Project 6	Rater 4	dna
Project 7	Rater 5	Did not answer via follow up email

17. Based on your experience with the program, can you think of any ways the program might improve with respect to how it enrolls, trains, or integrates contractors into the program?

Project 1		
Project 2	Rater 1	No opinion
Project 3		
Project 4	Rater 2	Use a contractor-specific web portal: the problem is that none of us want to become experts at the EUC program. We want to implement it in one-way or the other, as a contractor, owner or rater. So clicking onto a website that has everything there… (currently) it is very jargon easy. It is very technical and I don't know if there is a way to un-technical (implementation staff staff) it. You know what I mean? Have a power user mode and a dumb project manager mode. I am not sure but there has got to be some way to do that.

Project 5	Rater 3	Should debrief with participant contractors in a forum
Project 6	Rater 4	Bring clarity to CAS and whose responsibility it is
Project 7	Rater 5	Did not answer via follow up email

[ASK IF RATER WORKS IN MULTIFAMILY MARKET-RATE SECTOR:]

a. Are your suggestions equally applicable to both affordable housing and market-rate projects?

Project 1		
Project 2	Rater 1	yes
Project 3		
Project 4	Rater 2	yes
Project 5	Rater 3	yes
Project 6	Rater 4	n/a
Project 7	Rater 5	n/a

[IF NO]

b. Which ways are applicable to affordable housing projects, which are applicable to market-rate projects and which are applicable to both?

Project 1		
Project 2	Rater 1	n/a
Project 3		
Project 4	Rater 2	n/a
Project 5	Rater 3	n/a
Project 6	Rater 4	n/a
Project 7	Rater 5	n/a

Working with Owners

18. Based on your experience with the program, can you think of any ways the program might improve with respect to how it enrolls and works with owners and managers?

Project 1		
Project 2	Rater 1	No, fairly smooth
Project 3		
Project 4	Rater 2	Simplify the website: Use a owner-specific web portal: the problem is that none of us want to become experts at the EUC program. We want to implement it in one-

		way or the other, as a contractor, owner or rater. So clicking onto a website that has everything there… (currently) it is very jargon easy. It is very technical and I don't know if there is a way to un-technical (implementation staff) it. You know what I mean? Have a power user mode and a dumb project manager mode. I am not sure but there has got to be some way to do that.
Project 5	Rater 3	Yes; through a forum
Project 6	Rater 4	Bring clarity to the CAS element of the program
Project 7	Rater 5	Provide owners with ball park estimates of what their incentives may be. Everything is a business decision. The extent possible, frame in terms of money.

[ASK IF RATER WORKS IN MULTIFAMILY MARKET-RATE SECTOR:]

a. Are your suggestions equally applicable to both affordable housing and market-rate projects?

Project 1		
Project 2	Rater 1	yes
Project 3		
Project 4	Rater 2	yes
Project 5	Rater 3	yes
Project 6	Rater 4	n/a
Project 7	Rater 5	yes

[IF NO]

b. Which ways are applicable to affordable housing projects, which are applicable to market-rate projects and which are applicable to both?

Project 1		
Project 2	Rater 1	n/a
Project 3		
Project 4	Rater 2	n/a
Project 5	Rater 3	n/a
Project 6	Rater 4	n/a
Project 7	Rater 5	n/a

Energy Models

19. Do you think the energy modeling software included all key energy components of the building? If not, please explain what was not included. [ASK FOR EACH PROPERTY RATER ASSESSED]

Project 1 Project 2 Project 3	Rater 1	Yes, as long as you know work arounds. TDV is impossible to do calcs for outside of EPro
Project 4	Rater 2	No; need to be improved. Currently 70- 80% accurate model. Does not include exterior lighting and lighting is poorly modeled (interior). In-unit appliances ok to deal with; laundry rooms are not. Even high rise still stuck—commercial software might be more appropriate but does not deal with in-unit appliances well.
Project 5	Rater 3	Software does; the first modeler did not input everything correctly though
Project 6	Rater 4	Has all components but certain upgrades are difficult to model—things at per building level Certain upgrades are difficult to model because it is primarily the things that are input to the HERS tab which is at the building level, which is the lighting and the refrigerators and dishwashers and washers and dryers. All are put into one specific task and is at a per building level, so you can't – you have to – the [funky? 18:57] way is I have to add up all of the light for the entire building and then divide it by the number of dwelling units so that you get an assumed average and that you would put that into the model and then it multiplies it back out for the number of dwelling units. So lighting upgrade, refrigerators, dishwashers, washers and dryers are all very difficult unless you are doing a 100% upgrade. Sometimes you don't do a 100% upgrade on refrigerators because only half of the property and half of the units have a really old refrigerator and the other half has a decently new one, so it makes it hard to give a property owner the flexibility to upgrade only the components that really do need an upgrade and will save energy as part of upgrading;
Project 7	Rater 5	Has been using EnergyPro since 2010. Likes the software. Thought it generally included all the key aspects.

20. Do you think there were big energy savings opportunities on the [PROPERTY NAME] that were missed due to modeling software limitations? If so, please explain. [ASK FOR EACH PROPERTY RATER ASSESSED]

Project 1 Project 2 Project 3	Rater 1	No, but doesn't think the program allowed Exterior lighting or if it did, there was lot of back and forth to figure it out (which is expensive). Detached exterior lighting (like parking lot lighting) on a property is a great potential energy saver. It may have eventually been allowed but there was not an approved method for performing this calculation (as with other measures)
Project 4	Rater 2	Yes: Lighting is not being calculated correctly because the model is built for SF: All the exterior lighting on a project, building mounted lighting, site mounted lighting, parking lot lighting, that all needs to be modeled. There is no way to do that.
Project 5	Rater 3	no
Project 6	Rater 4	One opportunity is water efficiency; Because if you can tell it just how much water is currently being consumed, it would give you an accurate understanding of how much energy you are using to heat the hot water. And then if you can reduce the heating demand, then you can create energy savings which is usually therm savings used by natural gas water heaters. So that is I would say the biggest opportunity in Energy Pro for savings.
Project 7	Rater 5	Modeled in the software fine, but owner was unwilling to do(attic insulation, AC-maybe heat pump

21. Is there any reason to expect the software models would not align with actual savings seen in a billing analysis of the property (beyond the fact the software models are often inaccurate)? [ASK FOR EACH PROPERTY RATER ASSESSED]

Project 1	Rater 1	No, but the models were not calibrated by bills
Project 2		No, but the models were not calibrated by bills
Project 3		No, but the models were not calibrated by bills
Project 4	Rater 2	Have a very low vacancy rate. Would be very difficult to get all units' billings analysis; HERCC says that 10-15% units worth should be ok. Should probably go with a standardized EPA appliance for external calculation of lighting, W/D, and

		appliances. Might increase the accuracy above the model.
Project 5	Rater 3	No doesn't think so
Project 6	Rater 4	Utility bills; inside the modeling software you can average out the estimated energy consumption using the utility bill data, but for a multifamily property even if you have just one building and you have 15 tenants in that one building, it is impossible to retrieve all of their utility bills to use that information, one for calibrating the model against the actual utility usage as well as using that information for other parts in the assessment report. So really getting the tenant utility bills is an impossible task and you really can't – no one can achieve a 100% compliance with that piece of the work scope for multifamily buildings
Project 7	Rater 5	Did not answer via follow up email

a. Was the property master metered but only some units treated?

Project 1	Rater 1	Electricity individually metered, gas mater metered; all units treated. (data came from candidate matrix)
Project 2	Rater 1	Electricity individually metered, gas mater metered; only a portion of the units treated. (data came from candidate matrix)
Project 3	Rater 1	No, all units treated
Project 4	Rater 2	No; individually metered
Project 5	Rater 3	No, all units treated
Project 6	Rater 4	No, Never see master metered
Project 7	Rater 5	Electricity and gas individually metered; only a portion of units treated (data came from screening questionnaire)

b. Did the property receive measures from another program (i.e., ESA) around the same time?

Project 1	Rater 1	No
Project 2	Rater 1	No
Project 3	Rater 1	No
Project 4	Rater 2	Yes, EUC SF
Project 5	Rater 3	no
Project 6	Rater 4	Ask (PG&E staff) for ESA;

Project 7	Rater 5	Yes, EUC SF

c. Were the units occupied at the time of the assessment/test-in?

Project 1	Rater 1	yes
Project 2	Rater 1	yes
Project 3	Rater 1	yes
Project 4	Rater 2	yes
Project 5	Rater 3	no
Project 6	Rater 4	yes
Project 7	Rater 5	yes

Outreach

22. How did you first hear about the Energy Upgrade California Multifamily Whole-building Program?

Project 1		
Project 2	Rater 1	Email from implementation staff
Project 3		
Project 4	Rater 2	Heard about word of mouth but then also heard more from the owner: We attend seminars and stuff like that on incentive programs. I think we heard about it but I think it was [OWNER] saying, can you guys do this program for us? That is what got us into the program and made us jump through the hoops to get certified. Or not certified but we had to apply and fill out all the paperwork and all that. I think our insurance was fine so I don't think there were any particular issues. It was just a matter of going through the approval process
Project 5	Rater 3	Through implementation staff
Project 6	Rater 4	dna
Project 7	Rater 5	From the CAMFEB training

23. Are there other good ways the program could have reached you or can reach other raters?

Project 1	Rater 1	DK, but based on limited conversations he's had with others, other raters though that since this was a small program, they'd never get in. Also, they thought one rater company (AEA) in particular was going to be
Project 2		
Project 3		

		handed all the projects. Their perception (that I heard from a couple raters) was that AEA would be handed all the slots.
Project 4	Rater 2	Through trainings: BPI MF certified, GPR Existing MF certified
Project 5	Rater 3	Through TCAC activities
Project 6	Rater 4	dna
Project 7	Rater 5	Did not answer via follow up email

Training

24. Did you attend the program-sponsored California Multifamily Existing Building Program Training "CAMFEB"? [IF NECESSARY: The training combines curricula that prepares professionals for both the BPI Multifamily certification exam and the "beta" HERS II Multifamily requirements. An optional fifth day will also allow professionals to receive a GreenPoint Rated MF Existing Buildings certification upon successful exam passage]

Project 1		
Project 2	Rater 1	no
Project 3		
Project 4	Rater 2	yes
Project 5	Rater 3	yes
Project 6	Rater 4	yes
Project 7	Rater 5	yes

[IF YES]

a. What did you think of this training? Please explain.

Project 1		
Project 2	Rater 1	n/a
Project 3		
Project 4	Rater 2	Thought it was pretty good for himself; staff thought it was worthwhile too.
Project 5	Rater 3	Dense and good training but rater should have some background or experience first the program should be more selective about who attends based on the rater's background and experience
Project 6	Rater 4	The BIG Ex MF portion was on par with other BIG trainings both in quality of materials and value of presentation. The BPI MF portion addressed the key sections that California auditors , like myself, struggle

		with on the exam (boilers). The CalCerts portion (this was my 2nd) still lacked any reference on how to approach high-rise, a very different audit and model. The BPI MF cert was the reason why both (my colleague) and I attended this training. Normally we would not both be out of the office and the field for a whole week. The BIG Ex MF cert was a bonus. We had hoped to get more information regarding the new PG&E program while in the training but instead implementation staff collected our program questions and instructed us to wait for the program webinar to follow.
Project 7	Rater 5	Helpful because it was required by the program

b. Having completed a whole-building project for the program, is there anything that should have been covered in the training that was not?

Project 1		
Project 2	Rater 1	n/a
Project 3		
Project 4	Rater 2	can't think of anything.
Project 5	Rater 3	dna
Project 6	Rater 4	Combustion Appliance Testing protocols, reporting, test-in failure remediation steps when renovations are declined. Options for Property Owners with small buildings (i.e. less than 5 units) that want an inclusive property upgrade
Project 7	Rater 5	Did not answer via follow up email

c. Did you earn certifications by going to the training that you did not have before?

Project 1		
Project 2	Rater 1	n/a
Project 3		
Project 4	Rater 2	Yes-staff did
Project 5	Rater 3	dna
Project 6	Rater 4	BPI MF, BIG Ex MF for both myself and my partner
Project 7	Rater 5	yes

[IF NO]

d. Why did you not attend this training?

Project 1 Project 2 Project 3	Rater 1	Qualified out of it. Had the requisite background already
Project 4	Rater 2	n/a
Project 5	Rater 3	n/a
Project 6	Rater 4	n/a
Project 7	Rater 5	n/a

25. Did you attend a program webinar that gave you an overview about how to participate in the program?

Project 1 Project 2 Project 3	Rater 1	yes
Project 4	Rater 2	yes
Project 5	Rater 3	yes
Project 6	Rater 4	yes
Project 7	Rater 5	yes

[IF YES]

a. What did you think of this webinar? Please explain.

Project 1 Project 2 Project 3	Rater 1	Fine, but knew the info already
Project 4	Rater 2	Don't remember/didn't pay much attention; flipped through the PPT presentation; So I used that as a reference. For instance when I was talking to my clients about the program I would have that open and flip through it. So I used the information.
Project 5	Rater 3	There should be more time. When it was time to answer questions from the attendees they didn't have enough time to address them
Project 6	Rater 4	little memory of the original webinar last February.
Project 7	Rater 5	Did not answer via follow up email

b. In what ways was this webinar valuable, if at all?

Project 1	Rater 1	n/a

Project 2		
Project 3		
Project 4	Rater 2	PPT was valuable; used the information with clients
Project 5	Rater 3	dna
Project 6	Rater 4	webinars are inconvenient. They take up valuable business hours and the speakers rarely provide bullet proof answers to the important questions after an hour and a half of summarizes that most of the real players in the industry know already
Project 7	Rater 5	Did not answer via follow up email

c. Having completed a program project, is there anything that should have been covered in the webinar that was not?

Project 1		
Project 2	Rater 1	no
Project 3		
Project 4	Rater 2	Directed information is important; separate program and technical information to provide relevant information at a glance; I need to understand how the program runs with bubble diagrams that say you are here and you got to get to here and this is the process. I like to look at stuff at a glance that shows me everything I need to do. Then I can dial in on, ok I don't have that information and that is what I need. So I tend to be impatient with some stuff.
Project 5	Rater 3	There should be more time. When it was time to answer questions from the attendees they didn't have enough time to address them
Project 6	Rater 4	A program update webinar for past participants who don't need the basics, that covers program changes and gives opportunity for discussion to get real answers across the industry would be valuable
Project 7	Rater 5	Did not answer via follow up email

[IF NO]

d. Why did you not attend this webinar?

Project 1		
Project 2	Rater 1	n/a
Project 3		

Project 4	Rater 2	n/a
Project 5	Rater 3	n/a
Project 6	Rater 4	n/a
Project 7	Rater 5	n/a

26. Did the program provide you any training outside of the CAMFEB or webinar, say in the field or in person?

Project 1		
Project 2	Rater 1	no
Project 3		
Project 4	Rater 2	no
Project 5	Rater 3	(implementation staff technical lead) and her team were phenomenal. Learned a lot and made sure rater was doing things right.
Project 6	Rater 4	Yes in the field see above
Project 7	Rater 5	Yes in the field

[IF YES]

a. What did this training consist of?

Project 1		
Project 2	Rater 1	n/a
Project 3		
Project 4	Rater 2	n/a
Project 5	Rater 3	(implementation staff technical lead) and her team were phenomenal. Learned a lot and made sure rater was doing things right.
Project 6	Rater 4	in the field see above
Project 7	Rater 5	implementation staff team provided informal advice during the QA/QC portion

b. What did you think of this training?

Project 1		
Project 2	Rater 1	n/a
Project 3		
Project 4	Rater 2	n/a

Project 5	Rater 3	(implementation staff technical lead) and her team were phenomenal. Learned a lot and made sure rater was doing things right.
Project 6	Rater 4	Positive-see above
Project 7	Rater 5	Good-very collaborative

27. Is there any additional training you would like the program to provide you going forward?

Project 1		
Project 2	Rater 1	no
Project 3		
Project 4	Rater 2	yes
Project 5	Rater 3	yes
Project 6	Rater 4	yes
Project 7	Rater 5	Did not answer via follow up email

[IF YES]

a. What sorts of training would you like to have? Why?

Project 1		
Project 2	Rater 1	n/a
Project 3		
Project 4	Rater 2	Do a clear and detailed outline with a sample report. Tailor to the program. Or go to an online tool, like they have on the SF side where you are just populating what they want you to populate
Project 5	Rater 3	The program should train HERS II raters to do CAS testing. CAS testing is critical. There are many ARRA-trained HERS II raters who are unemployed and the contractors do not know this topic well enough. Even if the contractors have BPI certification, the installers they oversee might not. MF blower door training is important since there could be leakage between units of people who smoke and use chemicals
Project 6	Rater 4	In San Diego, TRC the program admin provided a half-day high-rise modeling update training for past Raters. If you want an successful MF program that will be applicable to high-rise buildings, than you need a real training for high-rise because these are in affect a commercial building acting like a residential building

		and other than BPI's boilers, no training defines lighting-power-density auditing procedure, pressure and airflow dynamics in units connected to common interior hallways, or any of the other distinctions of high-rise versus low-rise.
Project 7	Rater 5	n/a

b. How is this training valuable or necessary for participating in the program?

Project 1		
Project 2	Rater 1	n/a
Project 3		
Project 4	Rater 2	Helps streamline and minimize time spent on the reporting
Project 5	Rater 3	The program should train HERS II raters to do CAS testing. CAS testing is critical. There are many ARRA-trained HERS II raters who are unemployed and the contractors do not know this topic well enough. Even if the contractors have BPI certification, the installers they oversee might not. MF blower door training is important since there could be leakage between units of people who smoke and use chemicals
Project 6	Rater 4	Did not answer
Project 7	Rater 5	n/a

28. For a project that consists of multiple buildings and configurations, what additional tools would help you understand how to package the project for work flow and submittal purposes?

Project 1		Always great to do QC on just 1 of multiple buildings so that changes can be made early and incorporated in all models. Otherwise this is common and no big deal.
Project 2	Rater 1	
Project 3		
Project 4	Rater 2	Develop MF CAS testing tool: they have a 2 to 4 unit CAS testing tool. But they didn't have one for the MF. Although it references it in the program documents. It says use our CAS tool. But they really didn't have anything. I think if there were a streamlined, fill-out-able PDF tool that allowed you to populate as you went through and then it became the document that you submit. So you are only filling something out once.
Project 5	Rater 3	dna

Project 6	Rater 4	When should I model the property as one .bld, as individual .blds per building or by building type? Will per unit modeling (due to pick and choose upgrades) be accepted by the PA? Pictures, what ftp site should everything be uploaded to because emailing is impractical for submission.
Project 7	Rater 5	Did not answer via follow up email

Participation Decision

29. After attending the training and/or the webinar, what was the biggest obstacle you had to get past before deciding to participate in the program?
    Probe for:
    --Lack of potential property owner clients?
    --Lack of certifications required by the program?
    --Software complexity?
    --Program complexity?
    --Cost of insurance?

Project 1	Rater 1	No obstacles
Project 2		
Project 3		
Project 4	Rater 2	No obstacles
Project 5	Rater 3	No obstacles
Project 6	Rater 4	Figuring out how to deal with and budget for CAS testing and issues (still an ongoing issue)
Project 7	Rater 5	Providing the owner with a ballpark estimate and getting their buy-in

30. What are the reasons you decided to participate in the program?

Project 1	Rater 1	Target market area
Project 2		
Project 3		
Project 4	Rater 2	Market we want to focus in and Existing client asked him to be on the project
Project 5	Rater 3	Existing client asked him to be on the project
Project 6	Rater 4	Client asked them to participate
Project 7	Rater 5	Client/contractor asked him to be on the project

31. What are the main reasons other raters might not participate in this program?

Project 1	Rater 1	Incentives might not cover their cost; or if they are only working with one property , then it may not be worth the administrative ramp up
Project 2		
Project 3		
Project 4	Rater 2	Complexity of the program.
Project 5	Rater 3	dna
Project 6	Rater 4	Too small to deal with the administrative burden or figuring out how to sell it. Difficulty with figuring out how to budget for CAS testing; don't know what the re-vamped program will be to create a business plan for it.
Project 7	Rater 5	Did not answer via follow up email

Marketing

32. What do your marketing efforts in the multifamily sector typically consist of?

Project 1	Rater 1	Go to MF events. Rater company execs include former real estate acquisitions and real estate asset managers. have existing networks, talk the talk; If a person does not have an existing relationship with a building's decision makers it is very difficult to create one from the curb knocking on a door.
Project 2		
Project 3		
Project 4	Rater 2	Attendance at meetings, past clients, other than that not much marketing
Project 5	Rater 3	Declined to comment about his marketing efforts
Project 6	Rater 4	Having business conversations
Project 7	Rater 5	Word of mouth

33. What messages and outreach methods are effective in getting property managers or owners to consider assessments and energy upgrades? Could you explain how and why these messages and methods are effective?

Project 1	Rater 1	Talking the talk;
Project 2		
Project 3		
Project 4	Rater 2	Doing good work and highlighting incentives
Project 5	Rater 3	Declined to comment about his marketing efforts
Project 6	Rater 4	For AH owners, its just a question of letting them know that a substantial portion of the EE project they are already going to do could be paid for.
Project 7	Rater 5	Do a rough assessment first give owners a ball park figure to begin with. Things have to be framed as a

		business decision. Can't scare them away with too many things at first. Have connections to lots of properties. So build relationships over time and look for deeper energy savings implementations next time.

34. What are the most effective ways to market and to message to market-rate properties? How about to affordable properties?

Project 1 Project 2 Project 3	Rater 1	MR: Change in the last five years: potential tenants are beginning to ask how green the properties are so owners are beginning to feel pressure to be LEED or ENERGY STAR® rating or greenpoint rated etc. Affordable housing has very thin margin lines. So typically they are not one to spend money on stuff out of pocket. But they are the ones that are being driven by laws that they have to do some of this stuff. So I think a lot of it for the market-rate to do it, it is going to have to be a mandate or they see a benefit in the returns.
Project 4	Rater 2	MR: not sure AH: attend the CA Affordable Housing meeting. Bring case studies and a knowledgeable business-savvy person to talk to the banks etc. : Case study should address: And you want to highlight some for-profit groups doing the retrofits and some non-profits. Show some samples of some real costs. Here was your total project cost. Here was your energy project cost and here were the qualifying measures you guys did. Here is your dollars. It was 15% of your total cost. For the raters, their cost was half of that or a third of it or whatever it is. I think programs like these underestimate the time and cost to do this stuff.
Project 5	Rater 3	Declined to comment about his marketing efforts
Project 6	Rater 4	MR: Don't know-not their focus; AH: let us show you where to claim rebates for what you are likely already going to be doing. (esp. on HUD conversions)
Project 7	Rater 5	Same for each. Need to give them a ball park figure to begin with.

35. What are the best ways to communicate, display or present assessment results to property owners?

Project 1	Rater 1	Report is generally waste of time and money: the incentives and savings are most important. It's a business decision- they want a quick financial analysis
Project 2		
Project 3		
Project 4	Rater 2	written assessment with incentives up front
Project 5	Rater 3	HERS II SOFTWARE AND HERS SCORING
Project 6	Rater 4	Highlight the rebate money; the cost analysis that we also provide in the report. Telling the property owner how much energy they are going to save really doesn't give them any information that they care to know. Really the cost analysis that should be provided to them would be exactly how much energy savings their average tenant is going to receive and thereby how much increase to rent the landlord can charge without altering the budget of their tenant because that's really the number that these property owners care about when it comes to energy savings to dollars.
Project 7	Rater 5	Did not answer via follow up email

36. Over the next year, the program will expand its marketing efforts. Do you have any recommendations for how it should:
    a. Reach out to market-rate property owners or managers?
    Probe for messaging, outreach methods.

Project 1	Rater 1	Increase assessment incentive; finders fee; hit at acquisition; direct targeting of those folks- Go through PG&E database and find them – then contact directly
Project 2		
Project 3		
Project 4	Rater 2	Don't know (We have zero marketing dollars. All of our work is from word of mouth networking.)
Project 5	Rater 3	Declined to comment about his marketing efforts
Project 6	Rater 4	no
Project 7	Rater 5	Not sure.

    b. Reach out to affordable property owners or managers?
    Probe for messaging, outreach methods.

Project 1	Rater 1	dna
Project 2		
Project 3		

Project 4	Rater 2	AH: attend the CA Affordable Housing meeting. Bring case studies and a knowledgeable business-savvy person to talk to the banks etc.
Project 5	Rater 3	Declined to comment about his marketing efforts
Project 6	Rater 4	Yes, use case studies and speak to the rebates.
Project 7	Rater 5	Not sure

c. Support participating energy raters' marketing and outreach efforts?

Project 1	Rater 1	Call raters 'energy consultant'
Project 2		Make it a closed program
Project 3		Minimal docs done their way Sometime implementation staff was our client as much as the building owner… implementation staff wants some things to be satisfied and the client wants something different. Shouldn't these be the same? Using HERCC report template is painful…. We've created a better version of this for use in SCE program
Project 4	Rater 2	dna
Project 5	Rater 3	Declined to comment about his marketing efforts
Project 6	Rater 4	Nail the program down; define it, make it known so they can work on the business model and market it themselves. can't spill that budget until PG&E announces A) that there really will be a program and B) what the program is going to be because the last thing I need to do is fill my firm with a bunch of tire kickers that are actually never going to convert because the incentives are low. That will drag my company's profitability down horribly. s part of operations I explain each step what needs to happen so we can see a timeline of the project and every phase that needs to be completed without a defined, with a clear definition of the program such as all the spreadsheets that need to be filled out and incentives of full assertable program handbook that defines every if maybe contingency possibility.
Project 7	Rater 5	Did not answer via follow up email

Incentive Levels

37. The assessment incentives range from $2,500 to $10,000 per building or more depending on the number of units and whether the property is affordable or market-rate. What do you think of the assessment incentive levels with respect to:
    a. The percentage of the assessment you think the incentives covered?

Project 1	Rater 1	increase pay to rater always motivates; provide a percentage of the rebate up front to help the rater cover costs while the project is in construction, pay the rater directly and don't have it go through the property owner; Close to 100%
Project 2		
Project 3		
Project 4	Rater 2	Just covered assessment and report writing, not test out.
Project 5	Rater 3	Did not answer
Project 6	Rater 4	It's ok; but the CAS requires a lot more for test-in and the test-out and there can be possible failures.
Project 7	Rater 5	Did not answer via follow up email

    b. How well it encourages owners to have an assessment done?

Project 1	Rater 1	Did not answer
Project 2		
Project 3		
Project 4	Rater 2	Does encourage owners
Project 5	Rater 3	Did not answer
Project 6	Rater 4	dna
Project 7	Rater 5	Was encouraging

38. How do <u>affordable rate</u> property owners view the assessment incentive level?

Project 1	Rater 1	Did not answer
Project 2		
Project 3		
Project 4	Rater 2	Encourages them
Project 5	Rater 3	Did not answer
Project 6	Rater 4	dna
Project 7	Rater 5	Was encouraging

    a. Should the assessment incentive levels for affordable-rate properties be adjusted? If so, how?

Project 1	Rater 1	Raters should get some money up front and at the end - at test out.
Project 2		
Project 3		
Project 4	Rater 2	Not sure
Project 5	Rater 3	Did not answer
Project 6	Rater 4	The assessment incentive levels help push those already interested in assessment and retrofits but they won't push those who have no interest. I will say that an experienced rater knows that the low income properties are much harder to survey than a middle income property. Write that down in your notes. Why? Because those apartments are far more crowded and cluttered. They are lower square footage. There is usually three times as many people living in the unit per square foot
Project 7	Rater 5	Did not answer via follow up email

39. How do market-rate property owners view the assessment incentive level?

Project 1	Rater 1	Did not answer
Project 2		
Project 3		
Project 4	Rater 2	Don't know
Project 5	Rater 3	Did not answer
Project 6	Rater 4	The market-rate owners are not "hot" to do EE like the AH are. The assessment incentive levels help push those already interested in assessment and retrofits but they won't push those who have no interest.
Project 7	Rater 5	Don't know

a. Should the assessment incentive levels for market-rate properties be adjusted? If so, how?

Project 1	Rater 1	Should be increased to the same level as AH; Raters should get some money up front and at the end - at test out.
Project 2		
Project 3		
Project 4	Rater 2	Don't think so
Project 5	Rater 3	Did not answer

Project 6	Rater 4	in the end of everything the amount of incentives that bring a property owner in have to be appealing enough that they'll abandon their resistance to doing a new thing and listening to somebody they've never talked to before and really look at the paperwork and everything else applying to The assessment incentive levels help push those already interested in assessment and retrofits but they won't push those who have no interest. Should be increased because of the CAS testing.
Project 7	Rater 5	Did not answer via follow up email

40. What do you think of the upgrade incentives?

Project 1		
Project 2	Rater 1	Did not answer
Project 3		
Project 4	Rater 2	Strange that the SF program offers such a higher incentive per unit. Work performed by rater is about the same for SF for MF: But there is triple the incentive for the SF program for the MF program for essentially the same energy savings. Like, for instance, this [Rohnert Park] project, we maxed out our incentive on SF and they had essentially triple the incentives for the identical retrofit strategy for the 2 to 4 unit program and the MF program. So there was an offset, which was a $10,000 affordable housing modeling and testing protocol. But even when you throw that in there the SF program clearly outshines the MF program. And they are doing the same work. So I don't have a good feeling for that but it seems like I don't see any real cost savings between us doing the MF and us doing the SF program on a cost per unit. There was very little difference in the hours we had to put into it. So our cost to develop and manage the program takes a larger chunk of the MF incentive money than the SF
Project 5	Rater 3	Did not answer
Project 6	Rater 4	in the end of everything the amount of incentives that bring a property owner in have to be appealing enough that they'll abandon their resistance to doing a new thing and listening to somebody they've never talked to

		before and really look at the paperwork and everything else applying to
Project 7	Rater 5	Encouraged owner to participate

a. Should the upgrade incentive levels be adjusted? If so, how?

Project 1	Rater 1	Better incentives – steeper incentive structure
Project 2		
Project 3		
Project 4	Rater 2	Probably to be more in line with the SF program
Project 5	Rater 3	Did not answer
Project 6	Rater 4	Did not answer
Project 7	Rater 5	Did not answer via follow up email

Program Requirements

41. What do you think of the certifications or eligibility requirements the program has for raters who want to participate in the program?

Project 1	Rater 1	Trainings and/or certifications are one thing (and very easy to get if you just sit in a class) but most of these graduates lack any practical knowledge. They may need mentorship. Taking the test does not make a person qualified to do the work.
Project 2		
Project 3		
Project 4	Rater 2	good
Project 5	Rater 3	Should be HERS II Raters
Project 6	Rater 4	Did not answer
Project 7	Rater 5	Did not answer via follow up email

a. Are there any certifications or requirements that should be adjusted or changed? If so, why?

Project 1	Rater 1	Add an experience requirement. When unqualified (inexperienced) raters do a property and flub it up it looks bad for everyone: the rater, the industry, the program, etc. I believe this market is mature enough to mandate verifiable proof of experience on a certain number of projects.
Project 2		
Project 3		
Project 4	Rater 2	no
Project 5	Rater 3	Did not answer
Project 6	Rater 4	Did not answer

Project 7	Rater 5	Did not answer via follow up email

42. What do you think of the certifications or eligibility requirements the program has for contractors who want to participate in the program?

Project 1 Project 2 Project 3	Rater 1	Don't know what they are. However, if a combustion equipment is changed out the CONTRACTOR should be held responsible for proper installation including spillage draft and CO. Rater can just QC the work by the contractor at the end and not do 100% at test out just as it is done in HERS. Test in combustion testing and the quantity tested – the point of the test in is to be able to estimate the amount of work necessary to fix all the issues by test out so the owner and contractor can factor that in to the work scope – that is the point. Quantities tested should be adjusted according to if that point/ goal is met.
Project 4	Rater 2	Provide an incentive to contractors to increase their enthusiasm for the program.
Project 5	Rater 3	Contractors should perform the scope of work and also be liable for any CAS issues on the work they are performing. The rater should not be held to BPI CAS testing since he does none of the work. The contractor should be liable.
Project 6	Rater 4	Did not answer
Project 7	Rater 5	Did not answer via follow up email

a. Are there any certifications or requirements that should be adjusted or changed? If so, why?

Project 1 Project 2 Project 3	Rater 1	Did not answer
Project 4	Rater 2	No
Project 5	Rater 3	Did not answer
Project 6	Rater 4	Did not answer
Project 7	Rater 5	Did not answer via follow up email

Working with Tenants

43. How was working with the tenants of [ASK FOR EACH PROPERTY]?

Project 1	Rater 1	dna
Project 2	Rater 1	dna
Project 3	Rater 1	dna
Project 4	Rater 2	Overall smooth: For us what is nice about it is that we have a good client and this project was already going to be under construction. So all the testing could be… so it comes under the overhead of hey this project is going to already be under construction. Setting up another interruption where we have to go into a residential unit and test it was not that big of a deal. Because the tenants already knew. They are already being moved in and out of their units based on what type of construction is already happening. So there is already disruption happening at the facilities. This was just another little speed bump in the program and then our staff has been doing MF audits for quite awhile. So my staff is totally used to dealing with tenants and understands the process. That is pretty smooth. I don't have to worry about my staff interacting with tenants.
Project 5	Rater 3	No tenants since it was a gut rehab
Project 6	Rater 4	Difficult; it was Christmas time; had to work around trees and presents.
Project 7	Rater 5	At first good since many were excited that they would be getting new windows. Later it became more difficult due to multiple entrances into the units

a. What were the issues, if any, with working with the tenants of [ASK FOR EACH PROPERTY]?

Project 1	Rater 1	dna
Project 2	Rater 1	
Project 3	Rater 1	
Project 4	Rater 2	No overall pretty smooth
Project 5	Rater 3	n/a
Project 6	Rater 4	it was Christmas time; had to work around trees and presents.
Project 7	Rater 5	Later it became more difficult due to multiple entrances into the units

b. Can you think of any ways the program might make the experience easier for tenants?

Project 1	Rater 1	dna
Project 2	Rater 1	
Project 3	Rater 1	
Project 4	Rater 2	Have apartment managers deal with this since they have the most experience with the tenants.
Project 5	Rater 3	n/a
Project 6	Rater 4	Avoid holidays
Project 7	Rater 5	Emphasize that the test outs are completed with their health and safety in mind.

Closing

44. Is there anything else you believe is important for me to know about the program based on the conversation we've had today?

Project 1	Rater 1	If there are 2-3 firms then they are assured a large chunk of work. It is costly to learn all the policies and procedures for a EUC program (or non EUC program) and if a company only gets 1 or 2 it will likely lose money (or make very little). If a company knows it is assured work it can more aggressively market. Also with just a few a common report and reporting can be done so all documents are the same no matter what firm is doing the work. Rater (Energy Consultant) is an extension of the program and not something the owner has to vet… they know the firm is legit. Also asked about when the program would start up again
Project 2		
Project 3		
Project 4	Rater 2	No But asked about when the program would start up again
Project 5	Rater 3	no
Project 6	Rater 4	now multiple upgrades required (for the SF side). You cannot participate in this program unless you do at least three measures. But to get the EUC incentives we have to take the three buildings that have more than four units as one group, the multifamily group and then all the other four unit buildings, they're a totally different group but they're all going through EUC. You start trying to explain to a homeowner or a property owner then you just start

		triggering all the confusion that causes and inevitable no.
Project 7	Rater 5	dna

45. If in looking over my notes, I need to clarify a point, may I contact you again for a quick follow-up question or two?

Project 1	Rater 1	yes
Project 2		Yes
Project 3		Yes
Project 4	Rater 2	Yes
Project 5	Rater 3	Yes
Project 6	Rater 4	Yes
Project 7	Rater 5	Yes

Those are all the questions I have today. On behalf of PG&E and the Energy Upgrade California Multifamily Program, thank you for your time.

H. PARTICIPATING CONTRACTOR DATA TABLES

Permission to Use Quotes

This interview is part of an evaluation study. All transcripts will remain in confidence with the evaluation team. We would like to use quotes without names in our reporting to directly share participant experience. However, it is possible that even without a name, you could be identified through other information such as the project's name or characteristics. With this in mind, may we use direct quotes from this interview without identifying you by name or do you prefer that we not use quotes from this interview?

Note: throughout "dna" stands for did not ask. This was used in situations in which there was not have enough time to complete a full interview or it was used in cases where the interview content suggested that the question would not be relevant to the participant.

Project 1	Contractor 1	Ok to record and use quotes without name
Project 2	Contractor 2	Ok to record and use quotes without name
Project 2	Contractor 3	Ok to record and use quotes without name
Project 3	Contractor 4	Ok to record and use quotes without name
Project 4	Contractor 4	
Project 5	Contractor 5	Ok to record and use quotes without name
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

Contractor Overview

1. Could you describe your professional background?
    a. What licenses, credentials and certifications do you hold?
    Probe for: licensed general contractor or specific trades, HERS II, RESNET, BPI (Multifamily Building and Building, Certified Energy Plans Examiner (CEPE), etc.

Project 1	Contractor 1	1972-1981 carpenters union; 1982 to now, project management with GC; primarily does NC in MF sector
Project 2	Contractor 2	GC with LEED AP, Masters in Engineering and a Masters in Real Estate Development; undergraduate degree in Planning. I have a Professional Certificate in Architectural Engineering
Project 2	Contractor 3	and I moved into project management about ten years ago and I've been doing large multifamily housing renovation projects ever since,
Project 3	Contractor 4	Home building for 13 years;
Project 4	Contractor 4	

Project 5	Contractor 5	I've got like general contractor license. I am a developer. We do have subdivisions that we do. I am a home inspector. I've done the LEED program. I've done the lead based paint program. I've done the asbestos program
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

b. Typically, what types of buildings do you work on? Single family, multifamily, commercial, etc.?

Project 1	Contractor 1	MF, NC for non-profit;
Project 2	Contractor 2	MF-apartments
Project 2	Contractor 3	MF, commercial,
Project 3	Contractor 4	Nc, remediation, all of the above
Project 4	Contractor 4	
Project 5	Contractor 5	all
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

c. In the last five years, about how many multifamily buildings jobs have you completed in which a principal aim was to increase the energy efficiency of the property, including any that you did before participating in the PG&E program?

Project 1	Contractor 1	5
Project 2	Contractor 2	11
Project 2	Contractor 3	10
Project 3	Contractor 4	2
Project 4	Contractor 4	
Project 5	Contractor 5	1
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

2. How long have you been working in the multifamily sector?

Project 1	Contractor 1	32 years
Project 2	Contractor 2	20 years
Project 2	Contractor 3	10 years
Project 3	Contractor 4	13 years
Project 4	Contractor 4	

Project 5	Contractor 5	9 years
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

a. What types of owners do you work for? Affordable housing? Market-rate?

Project 1	Contractor 1	Both, but doing more MR recently since state monies are drying up
Project 2	Contractor 2	Used to work mostly with MR but now AH too
Project 2	Contractor 3	mostly MR
Project 3	Contractor 4	Mainly AH
Project 4	Contractor 4	
Project 5	Contractor 5	Market-rate and affordable
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

3. [FOR EACH PROJECT ASK:]
   a. Did you have an existing business relationship with [INSERT PROPERTY OWNER] before you began the [INSERT PROPERTY NAME] project?

Project 1	Contractor 1	DK
Project 2	Contractor 2	no
Project 2	Contractor 3	no
Project 3	Contractor 4	yes
Project 4	Contractor 4	DK
Project 5	Contractor 5	yes
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

b. Who on the [INSERT PROPERTY NAME] team first knew about the Multifamily Whole-building Program and the available incentives? Was it yourself, the rater, the owner or someone else?

Project 1	Contractor 1	owner
Project 2	Contractor 2	owner
Project 2	Contractor 3	owner
Project 3	Contractor 4	owner
Project 4	Contractor 4	owner
Project 5	Contractor 5	The owner
Project 6	Contractor 6	Did not interview

Project 7	Contractor 7	Did not interview

Program Processes

4. How would you describe your experience participating in the program? What makes you say this?
   Probe for:
   --Did your participation go as you expected?
   --Did anything surprising occur?

Project 1	Contractor 1	A lot of good hand holding; a lot of good information; presented very well- very straightforward; Overall good
Project 2	Contractor 2	Fine; initial doc seemed insurmountable; "oppressive"; background checks on subcontractors and liability -felt more appropriate for SF— if I had to start the project with this guideline, I don't know that I would have done it.
Project 2	Contractor 3	It was good, It seemed to be pretty well put together and the goal is good obviously; it was actually easier than I thought. Nothing surprising occurred.
Project 3	Contractor 4	With PG&E is pretty easy; (PG&E staff) Brown
Project 4	Contractor 4	It seemed like there was kind of a disconnect between PG&E and BayREN, as far as like we're already approved for multifamily. Why do we have to go through this whole episode again of going through seminars and watching videos and all this kind of stuff? Because we just want to get it for the certification for the single-family. Because the units were only three units per building that qualified for the single-family program. So at (project) s we had both the multifamily and the single-family. We had to qualify for both of those programs in order for them to get the rebates
Project 5	Contractor 5	The level of EE is the approach he typically uses, so fit in well. Bad project management Miscommunication around appliance installation scheduling (delayed) and testing (very close on the heels) such that to make a long story short I had to run 150 cords to each and every single one of the gas stoves so they can put the electronic pilot to light the stove so they can test the stove.

		Numbers for apartments got flipped so couldn't get gas meters turned on by PG&E.
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

5. How would you describe working with the program implementation team: Build it Green?
   Probe for:
   -- Adequate level of communication
   -- Adequate level of coordination
   -- Adequate level of technical support
   -- Professionalism

Project 1	Contractor 1	Good: very informative
Project 2	Contractor 2	Good: (implementation staff) was fantastic—very interested in solving problems and was very responsive
Project 2	Contractor 3	Was great; very informative; (implementation staff) helped out with webinar; emails with (BIG technical lead)
Project 3	Contractor 4	Does not recall
Project 4	Contractor 4	
Project 5	Contractor 5	Very nice. BIG (implementation staff technical lead) - had good knowledge of the measures and planning and how to do it. Sort of helped project manage;
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

6. Thinking about the sequence of steps from property owner recruitment to assessment and scope of work, to retrofit, verification and final completion, can you make any suggestions for how these steps should be improved?

Project 1	Contractor 1	No; pretty smooth
Project 2	Contractor 2	Pretty clear- no need
Project 2	Contractor 3	from dealing with a lot of other contractors is everybody really likes the program the way it is and I haven't really heard anybody complain. I definitely didn't have any complaints the way it went.
Project 3	Contractor 4	No comments, no suggestions.
Project 4	Contractor 4	No comments, no suggestions.
Project 5	Contractor 5	Figure out who is in charge. (implementation staff technical lead) wound up managing

		So I told the rater you know you guys got to get in on the ground floor and let the contractor know what it is that you guys are expecting from us. So that I think would be a big help for you guys when you guys get into talk to these owners or these developers that you guys have got to be in on the ground floor. Would have liked to seen a piece of paper; itemized what you need to do for this project. About what was expected? Why do you need electronic over a BBQ lighter?
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

a. Which steps took longer or were more complicated than you expected? Please explain.

Project 1	Contractor 1	No comments, no suggestions.
Project 2	Contractor 2	No comments, no suggestions.
Project 2	Contractor 3	No-pretty easy, but The one thing I didn't expect was at some point during the process I was asked to do a criminal background check on all my employees. Criminal background check-already have to do them- -had to get new clearances -costs a lot of $ to do it: it costs a lot of money to do that. You know you don't just criminal background checks people for free. I have 190 employees so it cost me a lot of money to get the background checks done at the time that you guys wanted them done. They wouldn't accept my clearances from before. I had to get new ones done. I didn't really understand why all that had to be that way. -insurance was good -refused to sign the liability statement but a higher up within company must have
Project 3	Contractor 4	No comments, no suggestions.
Project 4	Contractor 4	No comments, no suggestions.
Project 5	Contractor 5	Was suddenly told to install stoves so they could be CAS tested; No one told him about any deadline prior
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

7. Did any safety concerns arise over the course of this project? If so, please describe how they were handled.

Probe for:
-- mold, lead, etc.

Project 1	Contractor 1	Not aware of any
Project 2	Contractor 2	Not that he was aware of, but that may have been more on [CONTRACTOR 1] side. [CONTRACTOR 2] was just doing windows and exterior lighting.
Project 2	Contractor 3	no
Project 3	Contractor 4	no
Project 4	Contractor 4	no
Project 5	Contractor 5	No problems
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

8. What do you think of the steps the program takes to ensure combustion appliance safety? Please explain your answer.

Project 1	Contractor 1	Thinks they are great; it's a necessity
Project 2	Contractor 2	Did not have perspective on that
Project 2	Contractor 3	Good the program is putting emphasis on that.
Project 3	Contractor 4	Was not involved, can't comment
Project 4	Contractor 4	Was not involved, can't comment
Project 5	Contractor 5	They are fine.
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

f. Did any CAS (Combustion appliance safety) issues emerge during any of your jobs?

Project 1	Contractor 1	Yes; Re-ducted the whole boiler room and then rater caught a mistake that had to be fixed
Project 2	Contractor 2	n/a
Project 2	Contractor 3	No-but seemed unclear as to what it was, identifying the smashing of CFLs as a CAS topic
Project 3	Contractor 4	No issues
Project 4	Contractor 4	No issues
Project 5	Contractor 5	no
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

g. Who on the project team was responsible for dealing with and identifying these issues?

Project 1	Contractor 1	rater
Project 2	Contractor 2	n/a
Project 2	Contractor 3	n/a
Project 3	Contractor 4	n/a
Project 4	Contractor 4	n/a
Project 5	Contractor 5	rater
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

h. How were these issues resolved?

Project 1	Contractor 1	Contractor fixed it
Project 2	Contractor 2	n/a
Project 2	Contractor 3	n/a
Project 3	Contractor 4	n/a
Project 4	Contractor 4	n/a
Project 5	Contractor 5	n/a
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

i. How did these issues impact the jobs?

Project 1	Contractor 1	Did not impact
Project 2	Contractor 2	n/a
Project 2	Contractor 3	n/a
Project 3	Contractor 4	n/a
Project 4	Contractor 4	n/a
Project 5	Contractor 5	n/a
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

j. Do you have any suggestions for how the program may might modify its Combustion appliance safety protocols?

Project 1	Contractor 1	no
Project 2	Contractor 2	n/a
Project 2	Contractor 3	n/a
Project 3	Contractor 4	DK
Project 4	Contractor 4	DK

Project 5	Contractor 5	Make clear how stoves may need to be checked with electronic ignition as opposed to BBQ lighter.
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

9. Can you think of any ways to improve the program that would make participation go more smoothly for contractors like you?

Project 1	Contractor 1	Not really
Project 2	Contractor 2	Get the PG&E restrictions on employee background checks and liability pulled out
Project 2	Contractor 3	No-appreciated how You were very lenient with the webinar hour. I mean you gave us five or six chances to get it done so I don't think so. And to be honest with you I didn't want to do it because you know I wasn't getting any incentive you know for doing it and we were being asked to provide more insurance and more background checks and more things. So I was hesitant.
Project 3	Contractor 4	Some of the stuff, I didn't understand some of the things when I was listening to the seminars, being that this was all new to me. Green, I've heard of green and things like that, but I didn't know the magnitude of how some of the things worked. They were kind of a little unclear. But for the most part, like I said, when (PG&E staff) finally kind of stepped in, because some things I wasn't sure, she was able to clarify things for me, and make it a little bit easier for me to understand
Project 4	Contractor 4	
Project 5	Contractor 5	Start at the beginning, need a team meeting; communication
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

10. Can you think of any ways to improve the program that would make participation go more smoothly for owners and raters?

Project 1	Contractor 1	Dna
Project 2	Contractor 2	Dna
Project 2	Contractor 3	dna
Project 3	Contractor 4	No, Pretty smooth, good communication
Project 4	Contractor 4	No, Pretty smooth, good communication

Project 5	Contractor 5	Start at the beginning, need a team meeting; communication
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

Working with Raters

[INTERVIEWER NOTE: note that some contractors may have been the raters – so in addressing this question be advised that their answers may reflect that situation.]

[FOR EACH PROJECT ASK]

11. Was the [PROJECT NAME] project the first time you worked with [RATER]?

Project 1	Contractor 1	Did not work with rater directly
Project 2	Contractor 2	Yes
Project 2	Contractor 3	Does not remember working with the rater at all; owner provided him a scope of work
Project 3	Contractor 4	yes
Project 4	Contractor 4	yes
Project 5	Contractor 5	no
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

[IF NO]

b. Do you have an existing and established relationship with [RATER]?

[IF YES]

a. Would you please explain what that is?

Project 1	Contractor 1	no
Project 2	Contractor 2	No; teams put together by Owners/managers
Project 2	Contractor 3	n/a
Project 3	Contractor 4	n/a
Project 4	Contractor 4	n/a
Project 5	Contractor 5	Have worked with them before on other projects
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

12. How was working with [RATER]?

Project 1	Contractor 1	n/a
Project 2	Contractor 2	Great

Project 2	Contractor 3	n/a
Project 3	Contractor 4	DK
Project 4	Contractor 4	Very easy
Project 5	Contractor 5	Fantastic, but mixed,
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

a. Did any issues arise working with raters?

Project 1	Contractor 1	n/a
Project 2	Contractor 2	no
Project 2	Contractor 3	n/a
Project 3	Contractor 4	no
Project 4	Contractor 4	no
Project 5	Contractor 5	Never saw the assessment; some miscommunication issues;
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

b. Were there any issues with the Scope of Work? Was it clear? Did it describe the upgrades in enough detail to complete the work correctly?

Project 1	Contractor 1	No issues
Project 2	Contractor 2	No issues; very clear
Project 2	Contractor 3	owner provided him a scope of work
Project 3	Contractor 4	Yes-cut and dry
Project 4	Contractor 4	Yes- scope of work expanded as there continued to be money on the project and the measures were added.
Project 5	Contractor 5	Never saw this
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

Energy Models

[FOR EACH PROJECT ASK]

13. Do you think there were big energy savings opportunities on the [PROPERTY NAME] project that the energy modeling software significantly undervalued or did not model well? If so, please explain.

Project 1	Contractor 1	no

Project 2	Contractor 2	Not any important ones-good bang for buck
Project 2	Contractor 3	no
Project 3	Contractor 4	No comment
Project 4	Contractor 4	No comment
Project 5	Contractor 5	No; never saw the model;
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

14. Were there any energy improvements that were not included in the [PROPERTY NAME] project that you believe should be included?

Project 1	Contractor 1	no
Project 2	Contractor 2	Don't know
Project 2	Contractor 3	no
Project 3	Contractor 4	DK
Project 4	Contractor 4	Pretty comprehensive
Project 5	Contractor 5	Yes
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

[IF YES]

a. Would you please list what those are?

Project 1	Contractor 1	n/a
Project 2	Contractor 2	n/a
Project 2	Contractor 3	n/a
Project 3	Contractor 4	n/a
Project 4	Contractor 4	n/a
Project 5	Contractor 5	Possibly solar but almost done with the project so hard to get it in later
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

Outreach

15. How did you first hear about the Energy Upgrade California Multifamily Whole-building Program?

Project 1	Contractor 1	Through the owner
Project 2	Contractor 2	While working on the project
Project 2	Contractor 3	Word of mouth
Project 3	Contractor 4	Through owner

Project 4	Contractor 4	Through owner
Project 5	Contractor 5	Learned about it from implementation staff
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

16. Are there (other) good ways the program could have reached you or can reach other contractors?

Project 1	Contractor 1	DK
Project 2	Contractor 2	Again if there was an ability for a contractor to share in the proceeds and they had some financial stake in it, without increased liability, there would be more interest. since the contractors do not receive any incentives directly, the program should focus on managers and owners who are incented. Then enrolled contractors can offer service. if you can figure out how to make money with the program then people are going to pay attention Or if you are more likely to get the job because it is mandated. So if you are able to separate yourself from some other contractor because you are qualified and the qualifications are so stringent that the dollars are going to talk
Project 2	Contractor 3	Home Depot, Lowes- Wherever they have to go to get their supplies (especially tools) is the best place to reach out to them.
Project 3	Contractor 4	Local (Marin, Contra Costa) chapters of No Cal Builders exchange; quarterly newsletter; PCBC (purchasing contractors building convention) in June 25/26 at Moscone center—all suppliers-have it's where all the builders come there, and all the suppliers bring all their products there, and show case all the latest and greatest stuff. So I think if PG&E had a booth there, I think that would be huge, too.
Project 4	Contractor 4	
Project 5	Contractor 5	dna
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

Training

17. Did you attend the program-sponsored California Multifamily Existing Building Program Training "CAMFEB"? [IF NECESSARY: The training combines curricula that prepares professionals for both the BPI Multifamily certification exam and the "beta" HERS II Multifamily requirements. An optional fifth day will also allow professionals to receive a GreenPoint Rated MF Existing Buildings certification upon successful exam passage]

Project 1	Contractor 1	dna
Project 2	Contractor 2	no
Project 2	Contractor 3	no
Project 3	Contractor 4	no
Project 4	Contractor 4	
Project 5	Contractor 5	no
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

[IF YES]

e. What did you think of this training? Please explain.

Project 1	Contractor 1	dna
Project 2	Contractor 2	n/a
Project 2	Contractor 3	n/a
Project 3	Contractor 4	n/a
Project 4	Contractor 4	
Project 5	Contractor 5	n/a
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

f. In what ways was this training valuable, if at all?

Project 1	Contractor 1	dna
Project 2	Contractor 2	n/a
Project 2	Contractor 3	n/a
Project 3	Contractor 4	n/a
Project 4	Contractor 4	
Project 5	Contractor 5	n/a
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

g. Having completed a whole-building project for the program, is there anything that should have been covered in the training that was not?

Project 1	Contractor 1	dna
Project 2	Contractor 2	n/a
Project 2	Contractor 3	n/a
Project 3	Contractor 4	n/a
Project 4	Contractor 4	
Project 5	Contractor 5	n/a
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

h. Did you earn certifications by going to the training that you did not have before?

Project 1	Contractor 1	dna
Project 2	Contractor 2	n/a
Project 2	Contractor 3	n/a
Project 3	Contractor 4	n/a
Project 4	Contractor 4	
Project 5	Contractor 5	n/a
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

[IF NO]

i. Why did you not attend this training?

Project 1	Contractor 1	dna
Project 2	Contractor 2	Too many days long
Project 2	Contractor 3	dna
Project 3	Contractor 4	dna
Project 4	Contractor 4	
Project 5	Contractor 5	More for raters
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

18. Did you attend a program webinar that gave you an overview about how to participate in the program?

Project 1	Contractor 1	yes
Project 2	Contractor 2	yes
Project 2	Contractor 3	yes
Project 3	Contractor 4	yes

Project 4	Contractor 4	
Project 5	Contractor 5	no
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

[IF YES]

e. What did you think of this webinar? Please explain.

Project 1	Contractor 1	Went pretty well;
Project 2	Contractor 2	Not particularly useful because already had read all the paperwork in detail.
Project 2	Contractor 3	Boring but informative; not enough interaction; very dry
Project 3	Contractor 4	Dense but valuable;
Project 4	Contractor 4	
Project 5	Contractor 5	n/a
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

f. In what ways was this webinar valuable, if at all?

Project 1	Contractor 1	very informative
Project 2	Contractor 2	Not particularly valuable because was already familiar with everything
Project 2	Contractor 3	Doesn't remember it.
Project 3	Contractor 4	She had no background in green or EE building so it helped her come up to speed
Project 4	Contractor 4	She had no background in green or EE building so it helped her come up to speed
Project 5	Contractor 5	n/a
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

g. Having completed a program project, is there anything that should have been covered in the webinar that was not?

Project 1	Contractor 1	Did not discuss PV or solar hot water; what is wa ht is not.
Project 2	Contractor 2	no

Project 2	Contractor 3	Nice to know about: huge low flow toilets.
Project 3	Contractor 4	no
Project 4	Contractor 4	no
Project 5	Contractor 5	n/a
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

[IF NO]

h. Why did you not attend this webinar?

Project 1	Contractor 1	n/a
Project 2	Contractor 2	n/a
Project 2	Contractor 3	n/a
Project 3	Contractor 4	n/a
Project 4	Contractor 4	n/a
Project 5	Contractor 5	Was given the information/link but contractor never had time to have a look; even after the project is finished has not watched it.
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

19. Did the program provide you any training outside of the CAMFEB training or webinar, say in the field or in person?

Project 1	Contractor 1	no
Project 2	Contractor 2	no
Project 2	Contractor 3	no
Project 3	Contractor 4	no
Project 4	Contractor 4	no
Project 5	Contractor 5	no
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

[IF YES]

a. What did this training consist of?

Project 1	Contractor 1	n/a
Project 2	Contractor 2	n/a
Project 2	Contractor 3	n/a
Project 3	Contractor 4	n/a

Project 4	Contractor 4	n/a
Project 5	Contractor 5	n/a
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

b. What did you think of this training?

Project 1	Contractor 1	n/a
Project 2	Contractor 2	n/a
Project 2	Contractor 3	n/a
Project 3	Contractor 4	n/a
Project 4	Contractor 4	n/a
Project 5	Contractor 5	n/a
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

20. Is there any additional training you would like the program to provide you going forward?

Project 1	Contractor 1	Not really-am really busy; but would Entertain any email that implementation staff sends
Project 2	Contractor 2	yes
Project 2	Contractor 3	yes
Project 3	Contractor 4	no
Project 4	Contractor 4	no
Project 5	Contractor 5	dna
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

[IF YES]

c. What sorts of training would you like to have? Why?

Project 1	Contractor 1	n/a
Project 2	Contractor 2	Interested in both technical training-how to install measures optimally; and sales training.
Project 2	Contractor 3	information packet to contractors about the implementor
Project 3	Contractor 4	n/a
Project 4	Contractor 4	n/a
Project 5	Contractor 5	n/a
Project 6	Contractor 6	Did not interview

Project 7	Contractor 7	Did not interview

d. How is this training valuable or necessary for participating in the program?

Project 1	Contractor 1	n/a
Project 2	Contractor 2	dna
Project 2	Contractor 3	
Project 3	Contractor 4	n/a
Project 4	Contractor 4	n/a
Project 5	Contractor 5	n/a
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

Participation Decision

21. After attending the training and/or the webinar, what was the biggest obstacle you had to get past before deciding to participate in the program?
Probe for:
--Lack of potential property owner or property manager clients?
--Lack of certifications required by the program?
--Software complexity?
--Program complexity?
--Cost of insurance?

Project 1	Contractor 1	No obstacles
Project 2	Contractor 2	Signing the agreement; potential personal liability to the contractor for failing to comply with SS# trace and background check;. "Very one-sided" But because there is no profit to me as a contractor, why would I want the liability? It is one thing to have the liability without swearing that I have this policy. when you are having to swear that you are compliant and then you have a failure and PG&E is just going to use it to… because PG&E doesn't want to be liable. They are going to push all the liability back on the contractor because of this certification. That the ability to be pushed out of business because PG&E has got their legal maneuvering opportunities that I would not be able to defend because I don't have insurance against this. I could not adequately insure the risk. So it would cause me to not want to participate.

		To me this was just a legal maneuvering to benefit PG&E. It was just clearly one sided
Project 2	Contractor 3	Liability agreement
Project 3	Contractor 4	There was no question whether we were going to participate. We had to. For them, they'd be able to get the rebates and their funding and all that kind of stuff.
Project 4	Contractor 4	
Project 5	Contractor 5	Was already 80% done with the job, so he was just signed up onto the project.
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

22. What are the reasons you decided to participate in the program?

Project 1	Contractor 1	Owner/client wanted to participate for a project that was already started
Project 2	Contractor 2	Had already started the project when owner decided to participate. Had he known about the contractor agreement forms beforehand, he would likely not have worked on the project.
Project 2	Contractor 3	Owner/client wanted to participate
Project 3	Contractor 4	There was no question whether we were going to participate. We had to. For them, they'd be able to get the rebates and their funding and all that kind of stuff.
Project 4	Contractor 4	
Project 5	Contractor 5	Owner asked him to so she could collect the rebate
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

23. What are the main reasons other contractors might not participate in this program?

Project 1	Contractor 1	Easier for bigger firms to participate than for littler ones due to the liability/insurance issues
Project 2	Contractor 2	Contractor agreement form
Project 2	Contractor 3	Maybe nothing in it financially for the contractors; no incentives
Project 3	Contractor 4	I don't know, unless they've got to get in contact with raters and stuff like that. So I think that's an extra charge on the bottom line. Other than that, everything else is free. It's just a matter of signing up for it. So I wouldn't see any other reason why they wouldn't, or wouldn't want to, because everybody's going green
Project 4	Contractor 4	

		here, looking for ways to save money, and efficiency and things like that.
Project 5	Contractor 5	No real incentive for the contractor…. I'm not getting any rebate is what I'm saying.
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

Program Requirements

24. What do you think of the certifications or eligibility requirements the program has for contractors who want to participate in the program?

Project 1	Contractor 1	Upper management might views on it. Probably easier for bigger
Project 2	Contractor 2	Does not like the potential personal liability to the contractor for failing to comply with SS# trace and background check;. "Very one-sided" "oppressive"; background checks on subcontractors and liability - felt more appropriate for SF— The work that ended up being implemented as part of the program was also performed so I had control of the labor. And I didn't have to rely on any subcontractors
Project 2	Contractor 3	The insurance was good, not too high. The liability statement I didn't sign that. I refused to sign that. I had to send them up the ladder to my boss, that's something that I didn't really understand that either. We have liability insurance obviously you know for every job site. So I wasn't sure why – it seemed to me like and I could be wrong but it seemed like there was additional insurance being requested.
Project 3	Contractor 4	
Project 4	Contractor 4	Insurance was fine. Employees self-perform. Had an issue with employees' privacy and subs waiver; typically overseeing subs work; I didn't find them difficult or anything like that. Get a couple of insurance certificates and watch the webinar, and some of the things we already had in place. On my end it made it very easy That one, that was kind of an issue. The employees and subs kind of balked at it… They just were feeling that - you know, people are very protective of their privacy these days, and giving out their information. A lot of them were really skeptical So we did do it with some of our employees, and a couple of our subs did, too. We had a little difficult time trying to get them to sign the waiver and all that stuff, because they thought it was kind of an invasion of their privacy.

Project 5	Contractor 5	Seemed fine. Nothing stuck out to him; the paperwork and applications were easy and straightforward It was actually pretty easy because he helped me through the steps and there wasn't a whole lot to do. Yeah it was easy to work out
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

b. Are there any certifications or requirements that should be adjusted or changed? If so, why?

Project 1	Contractor 1	dna
Project 2	Contractor 2	Yes, strip PG&E's legal language from them.
Project 2	Contractor 3	dna
Project 3	Contractor 4	because we have our employees here that self-perform, and we know our employees, and as the contractor we should be responsible for them. Subcontractors, you never know, especially if they're going in and out of people's homes. We do put precautions in place where a subcontractor is not allowed to be in a home by themselves. There is always somebody from our company or maybe the property management company is always in there with them at all times. So that area, yeah, doing the background check, I think, was a little overkill, really;
Project 4	Contractor 4	M: Okay. So you're typically overseeing your subs anyway. R: Right, because they were checking for DUIs, and it's like what does my DUI that I got last year have to do with me performing my work in construction? They were having a hard time with the correlation.
Project 5	Contractor 5	no
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

Marketing

25. How do you typically promote your services to the multifamily sector, if at all?

Project 1	Contractor 1	Repeat work, non-profits, reputation, website; MF over parking garages; can't build them fast enough
Project 2	Contractor 2	Don't really; rely on referrals
Project 2	Contractor 3	Referrals, word of mouth

Project 3	Contractor 4	Cold calls, builders exchange, general networking
Project 4	Contractor 4	
Project 5	Contractor 5	I don't; -usually work on SF (but existing client in another space so "referral"
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

26. What messages and outreach methods are effective in getting property managers or owners to consider assessments and energy upgrades? Could you explain how and why these messages and methods are effective?

Project 1	Contractor 1	Talk about the energy credits.
Project 2	Contractor 2	DK
Project 2	Contractor 3	"Go green" Shame them into it; tell them to get with the energy and water saving practices that the rest of the state has implemented
Project 3	Contractor 4	make their places more appealing to possible renters, that they have efficient windows and appliances. So it'll save on their PG&E
Project 4	Contractor 4	
Project 5	Contractor 5	Has to be worthwhile; And help existing projects get better insulation and appliances.
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

27. What are the most effective ways to market and to message to market-rate properties? How about to affordable properties?

Project 1	Contractor 1	DK
Project 2	Contractor 2	Certainly having it in the utility bills and taking that approach, it would get some notice.
Project 2	Contractor 3	Offer contractor incentives to encourage marketing and outreach; "finder's fee" Depending on property size, fewer than 50 units $500; 50 or more $1,000. One thing that was interesting to me is that a lot of the incentives that are being offered are going directly to the ownership so I'm kind of curious as to what incentives may be out there just for the contractors. Oh man that's huge and these guys you know all of us are in competition with each other and I would love to walk up to somebody and say I got those two people on Build it Green, I got $2,000

		No suggestions-everyone likes the program as it is. But one thing is interesting is going directly; contractor incentives- I think so because what happens is you know these people, the owners, they have a good idea about what they want to do but it's basically the contractors that are giving them the suggestions and if the contractors are all about build it green and doing things a certain way then I can pretty much guarantee you that it's going to be implemented into the renovation process because like I said owners look to us for advice and you know what we think things should be done. So definitely aim it towards the contractors would be a great thing. to me if an owner takes the time to research and to get on the pilot program and to do things the right way then they deserve every cent of it that they get. If the contractor is taking all this information to an owner and helping them to make the decision then I think that a finder's fee or a signup fee or whatever you want to call it for the contractor to bring – I think that that's appropriate
Project 3	Contractor 4	DK
Project 4	Contractor 4	Dk
Project 5	Contractor 5	dk
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

28. Over the next year, the program will expand its marketing efforts. Do you have any recommendations for how it should:
    d. Reach out to market-rate property owners or managers?
    Probe for messaging, outreach methods.

Project 1	Contractor 1	DK
Project 2	Contractor 2	Highlight incentives
Project 2	Contractor 3	tenants are smart, smarter than the apartments give them credit for. I have tenants complaining about wasting light and windows, you know heating, you know the windows are bad and the air is just coming in and you're wasting They're looking for the low flow toilets and they're looking for fluorescent lights and they're looking for

		communities that care about the environment and all that stuff
Project 3	Contractor 4	DK
Project 4	Contractor 4	Dk
Project 5	Contractor 5	dna
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

e. Reach out to affordable property owners or managers?
Probe for messaging, outreach methods.

Project 1	Contractor 1	Dna
Project 2	Contractor 2	Highlight incentives
Project 2	Contractor 3	Dna
Project 3	Contractor 4	Dna
Project 4	Contractor 4	dna
Project 5	Contractor 5	dk
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

f. Support participating contractors' marketing and outreach efforts?

Project 1	Contractor 1	Dna
Project 2	Contractor 2	dna
Project 2	Contractor 3	Going green-shame-
Project 3	Contractor 4	Being listed as a program-approved contractor
Project 4	Contractor 4	Being listed as a program-approved contractor
Project 5	Contractor 5	dk
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

Incentive Levels

29. How do <u>affordable rate</u> property owners/managers view the assessment incentive level?

Project 1	Contractor 1	DK
Project 2	Contractor 2	DK
Project 2	Contractor 3	
Project 3	Contractor 4	DK, but know they're happy
Project 4	Contractor 4	

Project 5	Contractor 5	As a reward, helpful-was going to be doing this anyway;
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

a. Do you think increasing the assessment incentive would increase the likelihood of affordable rate properties opting for an assessment and retrofitting their properties?

Project 1	Contractor 1	DK
Project 2	Contractor 2	n/a
Project 2	Contractor 3	probably
Project 3	Contractor 4	yes
Project 4	Contractor 4	yes
Project 5	Contractor 5	No since they will do it anyway; will own the property for 40 years—are interested in doing it right the first time.
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

30. How do market-rate property owners/managers view the assessment incentive level?

Project 1	Contractor 1	DK
Project 2	Contractor 2	DK
Project 2	Contractor 3	dna
Project 3	Contractor 4	DK
Project 4	Contractor 4	Dk
Project 5	Contractor 5	May not be enough to convince them. As far as the owner is concerned if the unit is efficient or it's not efficient he doesn't really care as long as the people the PG&E bill. I mean it's not hurting him any if the people who are going to pay the PG&E leave they don't want to live there. Now if PG&E is going to give one heck of an incentive for them to change his units you know that might help, but the unit has got to be pretty bold for him to start changing it.
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

a. Do you think increasing the assessment incentive would increase the likelihood of market-rate properties opting for an assessment and retrofitting their properties?

Project 1	Contractor 1	DK
Project 2	Contractor 2	n/a
Project 2	Contractor 3	dna
Project 3	Contractor 4	n/a
Project 4	Contractor 4	n/a
Project 5	Contractor 5	Maybe
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

31. What do you think of the upgrade incentives?
    a. What percentage of the retrofit job (not the assessment) do you think the incentives covered?

Project 1	Contractor 1	DK
Project 2	Contractor 2	
Project 2	Contractor 3	dna
Project 3	Contractor 4	dk
Project 4	Contractor 4	dk
Project 5	Contractor 5	DK, but Was helpful-a lot of money
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

    b. How do property owners/managers view the upgrade incentive levels?

Project 1	Contractor 1	DK
Project 2	Contractor 2	DK
Project 2	Contractor 3	dna
Project 3	Contractor 4	DK, but know they're happy
Project 4	Contractor 4	DK, but know they're happy
Project 5	Contractor 5	Is helpful
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

    c. Should the upgrade incentive levels be adjusted? If so, how?

Project 1	Contractor 1	DK
Project 2	Contractor 2	n/a
Project 2	Contractor 3	dna
Project 3	Contractor 4	n/a
Project 4	Contractor 4	n/a

Project 5	Contractor 5	dna
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

Working with Tenants

32. How was working with the tenants of [ASK FOR EACH PROPERTY]?

Project 1	Contractor 1	Was fine
Project 2	Contractor 2	Fine-units were occupied during construction
Project 2	Contractor 3	Been really good but their homes are being turned upside down so expect some level of frustration.
Project 3	Contractor 4	Challenging; had to make special considerations for some: issues such as babies and elderly people, different work schedules or sleep schedules that had to be taken into consideration
Project 4	Contractor 4	
Project 5	Contractor 5	No tenants, complete rehab
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

a. What were the issues, if any, with working with the tenants of [ASK FOR EACH PROPERTY]?

Project 1	Contractor 1	No-happy with the upgrdaes
Project 2	Contractor 2	No-although the installation is an inconvenience, the tenants like the new measures.
Project 2	Contractor 3	Really none
Project 3	Contractor 4	Babies, elderly, sleep schedules; 48 hour notifications; a lot of coordination. but we had an exception one at (project) who knew their tenants very well, and the tenants trusted them. They knew how their tenants were, and so they kind of helped guide us. Okay, these are the only times that we can be in there. The difficulty with some of the things we just ran into was maybe our sub; we scheduled him, but the sub got a hiccup at another unit and wasn't able to make it down to that unit. So the tenants were expecting us to come in that day, and it didn't happen. Then we had to reschedule. So there was a few times that we had some frustrated people, but it was out of our control. So we try to do what we can to accommodate them. At (project) s they
Project 4	Contractor 4	

		were really good as far as if something happened, they would give them movie passes or something like that, of if they had to be out of the house for certain hours, they gave them movie passes so that they could leave the house for so many hours so we could get in there. So (project) s was - you know, we had some challenges there, but the property managers really accommodated us or made it easy for us. Well, I wouldn't - yeah, easy. Less difficult.
Project 5	Contractor 5	n/a
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

b. Can you think of any ways the program might make the experience easier for tenants?

Project 1	Contractor 1	Set up with managers to do presentations-community rooms and presentations areas
Project 2	Contractor 2	Lots of communication
Project 2	Contractor 3	dna
Project 3	Contractor 4	Dk-just have to accommodate and work around; property managers should lead tenant interface
Project 4	Contractor 4	
Project 5	Contractor 5	n/a
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

Closing

33. Is there anything else you believe is important for me to know about the program based on the conversation we've had today?

Project 1	Contractor 1	no
Project 2	Contractor 2	no
Project 2	Contractor 3	no
Project 3	Contractor 4	Background checks. Invasion of privacy. Overkill. Already accepted and covered by employer.
Project 4	Contractor 4	Background checks. Invasion of privacy. Overkill. Already accepted and covered by employer.
Project 5	Contractor 5	(Owner) says I have to keep these apartments by law for about 40 years. So if I put something cheap into the apartments they're going to break down. People are going to break them or whatever and I've got to change it after four or five years. If I put first quality in the

		beginning my long term is less costly by putting first quality in So she pretty much had the plan in place that you had 75 – 80 percent of the stuff already completed and installed. Do you think the money changed what was going to happen? I mean it was a nice reward but do you think if the money weren't there do you think the project would have basically ended the same way it ended?
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

34. If in looking over my notes, I need to clarify a point, may I contact you again for a quick follow-up question or two?

Project 1	Contractor 1	yes
Project 2	Contractor 2	yes
Project 2	Contractor 3	dna
Project 3	Contractor 4	yes
Project 4	Contractor 4	yes
Project 5	Contractor 5	yes
Project 6	Contractor 6	Did not interview
Project 7	Contractor 7	Did not interview

Those are all the questions I have today. On behalf of PG&E and the Energy Upgrade California Multifamily Program, thank you for your time.

I. NON-PARTICIPANT AND DROPOUT OWNER DETAILED FINDINGS

Property 1: Non-profit, affordable housing

Property characteristics:

- **Age:** Built in 1994
- **Units:** 56
- **Utility bills:** Tenants pay

General

- Increased energy efficiency during this period is crucial, since it is likely to not be improved until the next ownership turnover.
- The tenants liked the changes, in large part because the upgrades were all replacing 15 year old equipment. Significant upgrades in lighting and appliances.

Tax Credits / Financing

- Tax credits are the primary driver for this management company and the owners of facilities that they manage.
- Energy efficiency 20% above Title 24 is required to take advantage of tax credits. Any efficiency below this is free-ridership. Any efficiency above this is likely due to the program.
- Tax credits expire on a 15 year cycle. This means that each building managed by this company has a turnover in ownership every 15 years, and thus improvements are required (and often delayed until) this change in ownership.

Barrier to Pilot Participation

- This particular project was almost completed when implementation staff contacted the building manager. An energy rater had already been consulted to help create a scope of work that would allow them to meet the requirements to be 20% more efficient than Title 24. They had already secured a contractor and decided which measures to install. Much of the work required to participate was already completed.
- This company dropped out of the program due to the background check requirement. The work was largely done, and this company did not feel that it would have been advisable or feasible to go to their workforce mid-job and ask for paperwork that would meet these requirements.

Future Participation

- This respondent would certainly have participated if he had known about the project earlier and could have included the background-check requirements in the initial contractor negotiations.
- This company manages other buildings that they would like to have participate.

Satisfaction Scores

- Professionalism: 9 or 10
  - BIG staff
- Information provided by program:
  - 9 or 10

Property 2: Non-profit, affordable housing

Property characteristics:

- Age: Built in 2001
- Units: 95
- Utility bills: Tenants pay (though some other properties are master-metered)

General

- Respondent works for a management company that managed on behalf of an ownership group limited partner who owns 99.99% of the property. They are taking advantage of tax credits which require a 15 year cycle of improvements to keep up to code ("re-syndicate"), at which time incentive programs allow funding of additional upgrades.
- There are different tax credit categories.
  - Some are competitive on a point system that gives points for energy efficiency, but it is possible to get a high point score with little or no efficiency. This program makes it easier to get additional efficiency points. However, non-profit organizations would wait to see if the tax credit is approved first, before taking advantage of EUC, since they couldn't front the money for an efficiency focused project without piggybacking on a larger retrofit project.
  - The smaller, non-competitive tax credits require a minimum point value, and so are more likely to possibly not include any efficiency improvements without additional external incentives.
- Energy upgrades were already in scope of work, so no additional measure costs, but it does require additional administrative costs and time.

Heard of program

- Housing California Conference contact. Terra Segal at California Housing partnership.
- Future channels that would work well
  - California Housing Partnership
  - Non-profit Housing Association (NPH)
  - AMA and other property management organizations.
- Tax credits all go through California Tax Credit Allocation Committee

Tax Credits / Financing

- Similar situation to Property 1

- Must be tied to a larger rehab project (at least for affordable housing) because the rebates are not enough to justify efficiency-only improvements The rebate comes after the work is done, so non-profits can't front enough money for this. This is different than Property 3which is overseen by a public agency.
- Financing outside of the set tax-credit re-syndication system is almost impossible for these management companies. The tax-credit re-syndication locks in financing for 15 years…so changing that setup would require a level of organizational approval with the limited partner that would be nearly impossible to get, especially if the limited partner is a group investing in a fund rather than one entity.
  - In addition, if there are other loans already involving the property, these lenders need to approve additional financing as well. They do not want additional loans from third parties as they fear that the owners or managers may choose to prioritize repayment of these other new financing sources before the existing loans.
    - This is different than Property 3, which is overseen by a public agency and tends to work with a single bank for each project. Public agencies are themselves the property owner, they are a mission driven organization, and are able to float more up-front administration costs.
- On-bill financing would get around these issues, though property would have to be able to support this without additional financing.

Barrier to Pilot Participation

- Energy upgrades were already in scope of work, so no additional cost. However, testing, paperwork, and additional burden n residents made them decide to not participate. Three projects across both single family and multifamily could have gotten about half a million in rebates, and even then it was not worth participation because the money doesn't go to the non-profit who manages the properties, but to the ownership group. Thus the rebate money cannot be used for administrative expenses, and the rebates come after the project anyway, so significant extra administrative burden is hard for the non-profit to absorb into the project budget and timeline. Extra time and/or easy financing is key to increased participation in this sector.
- A one year timeline is too short. The specifics of tax-credit re-syndication may not be known for many months, and participation in EUC Multifamily is completely contingent upon this approval. This means that they couldn't sign up for a 1 year rebate timeline since they do not know at which point in the year the projects will be approved and finalized.
- Bay Area Regional Energy Network (BAYREN) – Offers some assistance with scope of work as well as testing. Though the incentives are not as high, the administrative burden is lower. This is a competing option.
- Construction contracts were all already signed, so additional liability requirements were a burden. If they had known of these going in it would have been less of a problem.
- This organization already had a relationship with an energy rater. In this case, the rater was able to quickly become qualified for the program, but if this had not happened they may not have participated, since it would have required getting a completely new energy rater up to speed on their specific project.

Differences with non-affordable housing market

- Financing would be easier as there are fewer financing stakeholders
- Split incentive – owner paid utility properties more likely to participate.

Future Participation

- This company manages other buildings that they would like to have participate.
- Has participated in other programs. Some other properties are 2-4 unit buildings, and so would fall under the Single Family EUC program.
- Good for projects with very tight budgets.
- Admin costs depend heavily on skill of site staff at property. Knowledgeable site staff allow faster paperwork processing.

Satisfaction Scores

- Professionalism: 9
- BIG staff information provided by program: 7 or 8
  - A lot of paperwork up-front, and respondents lacks an energy background, so leaned on energy consultant for information program required.

Property 3: Public agency, affordable housing

Property characteristics:

- **Age:** Built in 3 phases:1st: early 70's, 2nd: Mid 80's, 3rd: Late 90s
- **Units:** 1st: 48 units, 2nd; 14 units, 3rd: 17 units
- **Utility bills:** Tenants do NOT pay utility bills. Master-metered.
- **Affordable housing?:** Yes
- **Company type:** Public agency

General

- The retrofit of this particular property was planned for 2014 as part of a larger multi-property retrofit effort. This specific property was fast-tracked in order to try to meet the pilot deadline, but they were unsuccessful.
- This mission-driven public agency is always looking for rebates and grants to help fund property improvements. They have Siemen's industries, an energy services company, under contract to look for these opportunities and provide energy consultations and audits. Siemens pointed out this program, and the RHASNC decided to try to take advantage of it. Unlike Properties 1 and 2 which are managed by non-profits, this property is both owned and managed by one organization, and so the RHASNC has the authority and the capital to perform improvements like these, though it is still advantageous to do it along with retrofit projects that are already planned.
- Is still interested in participating.

- The EUC incentives were to go to improvements in exterior lighting. They would go to more (and more efficient) lighting that they will not provide without these incentives.

Heard of program

- Contacted by Siemens industries
  - Already under contract with Siemens industries to do audits of their portfolio for energy performance contracting. Siemens is always looking for rebates and grants.
- Future channels that would work well
  - National Association of Housing and Redevelopment Officials (NARO)
  - Non-profit Housing Association (NPH)

Tax Credits / Financing

- As a public agency, they do not receive tax credits for these properties.
- They are not beholden to a 15-year schedule, but look at when the economy of scale for their portfolio makes it financially feasible to make upgrades. Many properties are considered at once.
- This property is overseen by a public agency and tends to work with a single bank for each project. Public agencies are themselves the property owner, they are a mission driven organization, and are able to float more up-front administration costs.
- They like to use a local bank, but don't necessarily use the same one each time.
- On-bill financing would be attractive.
- Fiscal year runs April through March. The start of their fiscal year would be the best time to get involved.

Barrier to Pilot Participation

- Timeframe could not fit into 2013. Still wants to participate in 2014
- Higher incentives would not have made a difference. The bank who was putting forward financing needed to approve the project first, and this took too much time.
- Going through the board of commissioners, a staff report, working with financers…for larger projects this process would take about 6 months.
- Does take staff time to coordinate with tenants, but this was not a significant barrier.

Energy Rater relationship

- Semen's could not fulfil the energy rater requirements, so found a 3rd party energy rater. This wasn't a difficult process, and if this agency participates again they will likely do the same thing and go through Siemens.

Future Participation

- Will certainly try to participate in the future. This would probably come in the form of many properties at once.

Satisfaction Scores

- Professionalism:10
  - Implementation staff and PG&E
- Information provided by program: 10

Properties 4 and 5: For Profit, Market-Rate]

Property 4 characteristics:

- **Age:** Phase 1: 1972, Phase 2: 1975
- **Units:** 60
- **Utility bills:** 6 buildings: 1 Master metered, 1 with Gas and Electric, 4 with Tenant electric, owner pays others
- **Affordable housing?:** Not low income
- **Company type:** Limited partnerships (for profit)

Property 5 characteristics:

- **Age:** 1964
- **Units:** 36
- **Utility bills:** Tenants pay electric, owner pays for others
- **Affordable housing?:** Not low income
- **Company type:** Limited partnerships (for profit)

General

- Respondent is the President of a property management company.

Heard of program

- Mia Kitahara at StopWaste.org
  - Multifamily brainstorming session/council about what type of energy efficient programs would work for multifamily housing, beginning of 2012.
- Good ways to get the word out are apartment associations (though only 25% of multifamily are members.
  - California Apartment Association(not affiliated with the national apartment association)
  - National Apartment Association (not affiliated with the CA apartment association)
  - AOA – apartment owners association northern California branch
  - PG&E bills

Primary motivation for participation

- Reduce ROI on improvements
- Reduce operating cost, keep property up-to-date.

- Get help paying for improvements that need to be done, but are not as much of a priority because they aren't major aspects of setting the rent
- If incentives push ROI under 3 years, it is a sure thing. Between 3 and 5 is possible, depending on what else is going on, and over 5 years could possibly be done but would be a much lower priority.

Tax Credits / Financing

- N/A.

Barrier to Pilot Participation

- Process took so long…but they acknowledge that they started late.
- Assessment process took some time, then CAS issues to be addressed, didn't leave time for financing.
- Usually could complete the whole process in 12 months (though sometimes it would be tough, depending on property/project)
- Can't start the process in earnest until assessment is complete, as they don't know the specifics and scale of the project before that is completed.
- Budgets are generally made (in the market, not just for this interviewee) in September or November. Ideally the assessment would have been completes before then to allow a scope of work to be included in budget planning.

Energy Rater relationship

- Did not have an existing relationship with an assessor: implementation staff gave him three numbers, one for southern CA, one for Central CA, and one for Northern CA. 1st assessor charged too much for one property, even with the program incentive. He then recommended a small 1-person rater. The 1 person rater was cheap enough, but didn't offer much explanation of the results which really have helped. The original recommended assessor did end up doing one of the properties. They were much better with communication and explaining the implications of their results. Without this explanation, the results of both properties would have been much less useful.
- Build It Green's guidance as to what to do with the results of the energy assessment in relation to the program was very helpful…it isn't obvious.
- Combustion Safety issues are cumbersome…they had 17 different issues that were all very near each other within one 60 unit building. When they contacted PG&E to fix them they wanted the owner to set up 17 different appointments on 17 different dates. It was so cumbersome that they paid for it themselves and ate the cost.

Financing

- No tax credits.
- Prefer to do a program like this along with a larger upgrade to the building, since so much construction will be happening at once.
- Likely financing scenarios for market-rate multifamily housing.
  - Scenario one

        - Most existing building s are already leveraged with an existing loan. On a project that is intended to refresh the building in order to be able to raise the rent, they would take out a specific smaller line of credit to do the construction (construction loan). After the work was done, they could make the case to the bank that they can now charge higher rent to incoming tenants, and get a new overall loan load to pay off their old loan general loan in addition to the construction loan. This would leave them with an improved building, higher rents, and one larger newer loan to pay off.
    - Scenario two
        - Similar to the one above, but with a property that has just been purchased. Get a loan to buy the property, a construction loan to do the improvements, then a larger permanent loan to pay off the original loan and the construction loan.
    - Scenario three
        - If they have owned the building for a very long time and it needs general upkeep (not necessarily to raise rents, but just to keep the building up to date and in repair), they would prefer to do those upgrades in cash, since no increase in rent is likely to happen a loan with an interest payment is less attractive.
    - Scenario four
        - This is less common, but does happen frequently. The building owner opens a line of credit with the bank (i.e. a $100,000 credit line for improvements that end up costing $60,000). This specific credit line is then repaid on a monthly basis by income from the property, which has increased slightly due to lower energy operating costs. This is more hassle, but works out to a kind of reverse on-bill financing but with the program participant and the bank managing the repayment, rather than with the IOU.
- In this specific case, they paid for it in cash. The property already has a loan against it, so that made it difficult to leverage again, and they wanted to avoid a construction loan for a small building refresh. If a project is primarily energy efficiency related, it isn't generally going to allow an increase in rent, which means a loan is to be avoided if possible.
- A fixed rate loan would be more attractive than a construction loan and possibly more attractive than paying cash, but after the housing bubble banks are very hesitant to allow another non-construction loan on a property because this sets up competing debts that would have to negotiate with each other in the event of a default.
- On-bill financing is an attractive option, and would make it much more likely that an efficiency project would fit within the existing financing structure of the property.

Future Participation

- Plan on participating with Property 4 in 2014.

Satisfaction Scores

- Professionalism:10
- BIG staff information provided by program: 5

- Could be clearer. Implementation staff did not provide materials, but relayed info through phone calls and meetings.

Barriers

- The cost of the assessment is prohibitive. Make sure the emphasize certainty and speed of assessment rebate, or offer a cheaper $150 preliminary assessment to give them a good idea of if they will qualify.
- Ease of financing is key. Generally owners of market-rate buildings will not want or be able to take out a regular loan for an energy efficiency project as it generally won't allow rents to raise. Also, it doesn't reduce operating costs as much as in low-income housing, because much of the market-rate buildings are already updated as they go. On-Bill financing is very attractive, or at least financing that doesn't require trying to leverage an already leveraged property.
- ROI is important, and is why they decided to do the project. Energy efficiency does reduce operating costs, and if the combination of reduced operating costs and rebates push the ROI under 5 (ideally 3) years, it will get done.

General

- Energy Efficiency generally doesn't allow them to charge more rent (however, framed as "nice new quiet double paned windows" it might). Tenants generally don't consider this when comparing living space.
- Energy efficiency projects don't really raise the resale value of the building, except for a reduction in operating costs. It isn't a primary consideration like other aspects of the building are.

Property 6: For Profit, Market-Rate

Property characteristics:

- Age: DK
- Units: DK
- Utility bills: Tenants pay
- Affordable housing: No, but mostly students.
- Company type: Owned by Respondent, Managed by management company,

General

- This apartment facility is market-rate, but also primarily student housing. The efficiency projects was undertaken by itself, unlike other apartments in which the efficiency measures were installed as part of a larger retrofit. The primary motivator was rebates, and the convenience of replacing aging measures all at once and this reducing operation costs and administrative time required to replace things as they fail.
- This property did end up participating in the Single Family program, which works differently in that it requires blower door testing for test-in and test-out. The pre-post testing resulted in a smaller rebate than expected, and the specific results of the tests were disputed by the participant. The participant feels that the program is a positive thing, and would want to participate again if this test-

in-test-out rebate determination process were revised to remove the risk of an unexpected debate amount.

Heard of program

- The respondent had participated in similar SMUD programs and somehow got into contact with PG&E through that effort.

Decision Making

- Respondent is the ultimate decision maker. Respondent consults with one other person, the property manager.

Primary motivation for participation

- Rebates, and reducing the hassle required to replace measures piece by piece as they break, rather than all at once.

Tax Credits / Financing

- No tax credits.

Barrier to Pilot Participation

- This participant would participate in buildings that did qualify for multifamily instead of single family, as the multifamily has no risk of the rebate being different than what has been determined by the initial assessment.

Energy Rater relationship

- This respondent had a negative relationship with the energy rater, but it is important to note that this rater was working under the requirements of the Single Family program which uses a test-in/test out blower door test. The rebate is determined by the test-out, not modeling. Not only was the rebate much less than the participant expected, but she felt that the individual measurements were suspect. For example, the test-out efficiency was worse than the test-in, and some of the building dimensions seemed incorrect. The participant has worked with implementation staff and the energy rater to voice her concerns and feels that the implementer has been very professional in dealing with this issue, but was unable to get her a better rebate.

Financing

- This respondent paid for the project with a credit card. They expressed a similar idea as other respondents, in that a property that is already leveraged for financing, as this one is, it is difficult to secure additional loans on the property. The respondent doesn't expect to be able to raise rents or expect the property value to raise significantly. For improvements at this level, she said that she will either use a credit card to avoid a loan, or will "borrow" form the budgets of other properties she has in order to complete a larger project on an individual property.

Future Participation

- This respondent will not participate in the Single Family program again, unless the test-in/test-out requirement for rebate calculation is changed. She still finds the Multifamily program attractive, since the rebate level is not at risk of changing due to a test-out result.

Satisfaction Scores

- Professionalism:10
  - Implementation staff was very helpful to the extent that they could be.
  - Information provided by program was good
  - One refused to answer. She thought that giving a score for this would be inaccurate, since she was wrapped up in the back-and-forth negotiation with the rebate.

Barriers

- As described previously, the test-in test-out of the Single Family program is a barrier, but not for Multifamily.
- She is enthusiastic about participating in other Multifamily eligible buildings, since there is no risk of the rebate amount changing after the initial assessment.

J. NON-PARTICIPANT RATER DATA TABLES

Rater Overview

1. Could you describe your professional background?

ODCID	Response
1	Professional rater for residential new construction
3	General contractor specializing in insulation, lighting, heating. Heavily involved with most of PG&E energy efficiency programs
4	Energy Consultant primarily in new construction
6	Licensed civil engineer
8	Energy Consultant for both Residential and Nonresidential
13	Energy Efficiency Consultant and Rater
19	Certified Energy Manager
21	Energy consultant for the city of San Francisco, specializing in multifamily
24	Sustainability Consultant
30	Architect in New Construction and Energy Consultant
36	Windows installers
40	Certified construction manager

a. What credentials/certifications do you have?

Probe for: HERS II, RESNET, BPI (Multifamily Building and Building, Certified Energy Plans Examiner (CEPE), etc.

ODCID	Response
1	BPI Single-Family New Homes, BPI Single-Family Existing Homes BPI Multifamily, LEAD rater
3	BPI envelope, BPI building analyst, HERS II
4	CEPE, Certificate in Lighting and Plumbing Design, Certified Energy Planner
6	LEAD AP, Certified Structural Engineer, Certified Green Pointe Rater (SF/MF), Certified Green Building Professional
8	CEPE, LEAD AP, GreenPoint Rater multifamily New/existing construction, BPI Multifamily
13	BPI building analyst certification, GreenPoint Multifamily (New and Existing)
19	BPI Multifamily, GreenPoint Multifamily
21	BPI SF/MF building analyst, certified energy manager, HVAC certification, environmental engineering degree

24	BPI building analyst, enveloping, BPI SF/MF, Degree in Environmental Sustainability, GreenPoint Rater
30	BPI Multifamily, Resnet, Hers, CEPEC
40	BPI Multifamily

b. Do you know whether any of your training was supported through ARRA (American Reinvestment and Recovery Act) or utility (PG&E, SCE or SDG&E) funding? If so, please explain.

ODCID	Response
1	BPI Multifamily was partially paid for my PG&E
3	No
4	CEPE and Certified Energy Analyst as supported by PG&E and California Energy Council
6	Most likely PG&E because all trainings tend to be at the PG&E center
8	GreenPoint was partially funded by PG&E (paid for BPI exam out of pocket)
13	BPI & GreenPoint done through either PG&E or BIG
19	BPI Multifamily was done through SDG&E, all training has been done through Build it Green
21	BPI Multifamily & GreenPoint Multifamily – PG&E
24	No
30	BPI Multifamily & GreenPoint Multifamily – funded through ARRA
40	Construction Energy Management funded by ARRA possibly; BPI Multifamily – was funded by PG&E/BGE

c. How long have you been performing whole-building assessments?

ODCID	Response
1	2.5 years
3	20
4	NA-Rater does not personally perform whole-building assessments. Rater subcontracts assessments out
6	5 years
8	5 years
13	5 years
19	3 years
21	7 years
24	5 years
30	4 years

36	N/A – not a rater
40	20 years

d. What types of buildings do you assess? Single family, multifamily, commercial, etc.?

ODCID	Response
1	Single-Family, Multifamily
3	Single-Family
4	NA-Rater does not personally perform whole-building assessments. Rater subcontracts assessments out
6	Single-Family, Multifamily, Small Commercial
8	Multifamily
13	Multifamily
19	Commercial
21	Multifamily
24	Single-Family, Multifamily
30	Single-Family, Multifamily, Commercial
36	N/A – not a rater
40	Single-Family, Multifamily

e. About how many whole-building assessments of multifamily buildings have you completed?

ODCID	Response
1	None but have done countless 2-4 unit buildings
3	None
4	NA-Rater does not personally perform whole-building assessments. Rater subcontracts assessments out
6	None
8	10
13	50
19	None
21	20-40
24	3
30	None
36	None – not a rater
40	2

2. How long have you been working in the multifamily sector?

ODCID	Response
1	2.5 years
3	20 years
6	5 years
8	5 years
13	4 years
19	3 years
21	7 years
24	8 years
30	6 years
36	10 years
40	20 years

a. What types of properties do you assess? Affordable housing? Market-rate?

ODCID	Response
1	Market-Rate
3	Market-Rate
4	Market-Rate
6	Market-Rate + Affordable Housing
8	Affordable Housing
13	Market-Rate + Affordable Housing
19	Market-Rate
21	Market-Rate + Affordable Housing
24	Market-Rate
30	Market-Rate
36	N/A not a rater
40	Market-Rate + Affordable Housing

b. Aside from whole-building assessments, what other sorts of projects have you completed in the multifamily sector before becoming a rater?

ODCID	Response
1	Multifamily New Construction
3	Window Installation, HVAC, Lighting system design, Insulation
4	Energy and mechanical systems design
6	Energy Design Consulting
8	Energy modeling and reporting
19	Energy Management Design and Consulting
30	Architectural design
36	Window installation
40	None

3. When you do work in the multifamily sector, do you generally provide or recommend contractors, or does the property owner/manager provide the contractors?

   Probe for:

   --worked together on past projects
   --have an existing partnership
   --have a contractual relationship

ODCID	Response
1	Rater's company is a full fledge construction company.
4	Normally property owners have their own contractors but when possible, rater has an existing partnership with other contractors to use on a project.
6	Owners have their own contractors – they often refer rater potential work
8	Owners have their own contractors – they often refer rater potential work
13	Sometimes recommend contractors with existing partnership. Most of time owners have their own contractors
19	Owners have their own contractors – they often refer rater potential work
21	Owners have their own contractors
24	Have an existing relationship with contractors which connected rater with Multifamily work - they often refer rater potential work
30	Owners have their own contractors
36	Respondent is a contractor
40	Owners have their own contractors – they often refer rater potential work

4. Have you participated in another PG&E program – the Energy Upgrade California Whole House – also referred to as the "Home Upgrade" program?

ODCID	Response
1	No
3	Yes
4	No – rater claims he subcontracts out for that program
6	No
8	No
13	No
19	No
21	No
24	No
30	Yes
36	Yes
40	No

   a. Are you currently still participating in that program?

ODCID	Response
3	Yes
30	Yes

b. How many jobs as a rater have you completed in the EUC Home Upgrade program?

ODCID	Response
3	10
30	2

c. Which of the following best describes your opinion of that program:
   i. excellent
   ii. good
   iii. fair
   iv. poor

ODCID	Response
3	Poor
30	Good

Outreach Summary

5. How did you first hear about the Energy Upgrade California Multifamily Whole-building Program?

ODCID	Response
1	Was already attending Single Family rating training for simultaneously
3	Build it Green's mailing list
4	Rater actively participates in related programs and trainings and would discover similar programs along the way
6	Build it Green's mailing list
8	Build it Green's mailing list
13	Build it Green's mailing list
19	Build it Green's mailing list
21	Heard about it while working under related program "BAY REN" which was supported through PG&E
24	Rater is active on EUC SF and is often up to date on these programs
30	PG&E website
36	Found out through client(Existing multifamily building owner)
40	Build it Green's mailing list

6. Are there other good ways the program could have reached you?

ODCID	Response
1	By email or while attending related training programs
3	Email or utility forums
4	Workshops and seminars
6	Email
8	Email, Phone, Webinar
13	Trade shows and related professional development courses
19	Email or call
21	Email or call
24	PG&E website with central depository for such programs
30	Email, PG&E website
36	Email or call
40	Email or call

a. Can you think of ways it could reach other raters?

ODCID	Response
1	Don't Know
4	Don't Know
8	Email, phone, seminars, and workshops,
13	Local events and shows
19	Don't Know
21	Don't Know
24	Home Energy Forums; professional social media like LinkedIN, newsletters related to rating, trade events
40	Don't Know

Participation Decision

7. Why have you not participated in the program yet?
   Probe for:
   --Lack of potential clients?
   --Lack of certifications required by the program?
   --Software complexity?
   --Program complexity?
   --Cost of insurance?

ODCID	Response
1	Lack of potential clients. Current company is focused on New Construction not existing
3	Lack of potential clients. Rater's service area lack buildings that exceeded 4+ units. Rater also claimed that the pilot program was not accepting anymore applications for new projects

ODCID	Response
4	Lack of clients. Rater does not traditionally serve multifamily existing. Mainly new construction and whole-building assessment is often subcontracted out
6	Lack of clients. Rater does not traditionally serve multifamily existing
8	Lack of clients. Rater not aware of program or program requirements. Cite there is a lack of follow-up from PG&E or implementation staff
13	Liability and insurance requirements. Legal concerns associated with multifamily existing buildings
19	Lack of potential clients. Rater currently deals with New construction multifamily or commercial only
21	Conflict with current employer (city government) since they offer competing program "BAY RENT"
24	Was not intending to participate in multifamily program or pursue multifamily clients
30	Lack of potential clients. When rater tried to introduce a college dormitory into program, they were not qualified as Multifamily
36	Not an energy rating company. Simply inquired about program on behalf of client
40	Lack of potential clients or referral from contractors. Rater also claimed that the pilot program was not accepting anymore applications for new projects

8. Are you aware of the program's eligibility requirements for raters?

ODCID	Response
1	Somewhat
3	Somewhat
4	No
6	No
8	No
13	Yes
19	Yes
21	No
24	Yes
30	No
36	No
40	No

[IF YES]

a. What do you think of these requirements?

ODCID	Response
1	No issues
3	No issues

ODCID	Response
13	Rater does not like the liability and insurance requirements. Feels the program forces all the legal burdens on rater
19	No issues
24	No issues

b. Are there any requirements that should be adjusted or changed? If so, why?

ODCID	Response
3	Yes; Remove Requirement: "Removal of combustion appliances from thermal envelope" because it is costly to do
13	Make sure program is free of any potential legal liabilities when participating

9. Although you have not participated in the program yet, do you think it is likely that you will participate in it the future? Why or why not?

ODCID	Response
1	Yes
3	Yes
4	Yes
6	Yes
8	Yes
13	Yes
19	Yes
21	No
24	No
30	Yes
36	No
40	Yes

a. Under what conditions would you likely participate in the program?

ODCID	Response
1	if existing multifamily clients reach out to respondent for work
3	When pilot phase is over and there are interested clients
4	Yes, it just depends if there is multifamily existing work coming in
6	When there is a steady flow of multifamily existing clients
8	When she can get more information about the program from implementation staff or PG&E which can help her introduce EUC program to her multifamily existing clients
13	if the program gains traction with other raters and multifamily clients
19	Yes, it just depends if there is multifamily existing work coming in

ODCID	Response
21	Unless rater leaves current job, she is unable to because she works for the city government and promotes the competing "BAY Rent" program
24	None – current career goals is not to do ratings especially in multifamily
30	Unless the laws forces multifamily existing owners to take on these measures, tenants will not participate so neither will rater
36	Rating or assessments not part of company services
40	More referrals for work from contractors of multifamily existing clients, steady flow of clients

10. What changes could the program make to get you interested in participating?

ODCID	Response
1	N/A – nothing wrong with program. respondent is willing to participate but currently lacks client base
3	N/A – nothing wrong with program. respondent is willing to participate but currently lacks client base
4	N/A – nothing wrong with program. respondent is willing to participate but currently lacks client base
13	If legal concerns that might come up from multifamily clients were properly addressed
19	N/A – nothing wrong with program. respondent is willing to participate but currently lacks client base
21	N/A – nothing wrong with program just not interested in pursuing
24	N/A – nothing wrong with program just not interested in pursuing
30	If the client qualifies and requests to participate in the program. Increase incentives for owners to encourage interest
40	N/A – nothing wrong with program just not interested in pursuing

Marketing

[ASK SECTION IF RATER HAS BEEN ACTIVE IN MULTIFAMILY SECTOR]

11. What messages and outreach methods are effective in getting property managers or owners to consider assessments and energy upgrades? Could you explain how and why these messages and methods are effective?

ODCID	Response
4	They (property owners) won't consider any of those until the prospective tenants ask for it. Or if competing properties offer better energy efficiency in which they would start putting in more efficient equipment in order to attract tenants
6	Market energy efficiency as low maintenance, cheaper to operate in the long run

ODCID	Response
8	Have rater communicate similar programs to property owners. "Since Affordable multifamily existing have to do all energy upgrades anyway, they would be better off taking advantage of these programs"
13	Market these program at community events
21	DK - her clients come to her already interested in perform in energy upgrades
24	If you can communicate that upgrades can provide better quality/value and attract tenants and lead to higher financial valuation of property (Applying experience from Single Family which tenant says could be similar for multifamily)
30	DK –owner is not likely going to invest more than he has to on a multifamily property
40	"It all comes down to money" – whether helping them save or providing them money

12. What are the most effective ways to market and to message to market-rate properties? How about to affordable properties?

ODCID	Response
4	Not sure if it is possible, better to appeal to their tenants so they can appeal to them in turn (Market-Rate Properties)
6	DK
8	Affordable housing multifamily building owners rely on raters to provide them with this type of information
21	DK - her clients come to her already interested in perform in energy upgrades
24	DK – it is really tenant driven at the end of the day
30	DK – it is going to have to be really regulatory driven or tenant demand to push for change

13. From what you know of the needs and interests of multifamily building owners and managers, do you think that they would be interested in this program? Why or why not?
[ASK IF RATER WORKS ON BOTH MARKET-RATE AND AFFORDABLE HOUSING PROPERTIES IN THE MULTIFAMILY SECTOR]

ODCID	Response
4	It depends, if they are Affordable Housing properties then most likely because they are actively seeking ways to keep costs down for their tenants
6	It depends on the way the property is designed. For the older buildings with a central metering system for all their units, this might appeal to them because they are ultimately responsible for the bill
8	Yes, it would work for Affordable housing multifamily existing because part of their funding relies on ensuring they meet the standard for Energy Efficiency.
13	Yes, it would work for Affordable housing multifamily existing because part of their funding relies on ensuring they meet the standard for Energy Efficiency as dictated by

ODCID	Response
	the city. For Market-rate, they are less likely unless they are specifically trying to pursue some sort of LEAD recognition
21	Yes, because it's an opportunity for them to offset costs of performing upgrades
24	Refused – Does not feel qualified to answer
30	No, because the incentive funding will never be reasonable at covering the cost necessary to perform a decent analysis. In addition, the tenants ultimately pay for the bills not the owners. Owners will not do upgrades unless absolutely necessary.
40	Yes, because it saves them money (no difference with Affordable housing or Market-Rate)

a. Do you think owners and managers would have different levels of interest in the program depending on whether they had market-rate or affordable housing properties?
[IF YES] Why would there be different levels of interest?

ODCID	Response
4	Market-rate owners would be less interested because their costs are not connected to the energy bills of the property unlike affordable housing
6	Market-rate property owners will not be as concerned because they are ultimately not responsible for paying the utility bills
8	Market-rate property owners will be different because they require the program pay for a majority of the work in order to be worth their while.
21	The same level of interest but the speed of action for affordable housing is likely slower because they have other issues such as cost and compliance to worry about.
24	Refused – Rater does not feel qualified to discuss affordable housing
30	DK – Not involved with Affordable-housing
40	(no difference with Affordable housing or Market-Rate)

14. Are the multifamily property managers or owners you've worked with aware of the program?

ODCID	Response
4	No
6	No
8	No
13	Yes
19	No
21	Yes
24	N/A does not work in multifamily
30	Yes
40	No

[IF YES]

a. How did they find about the program?

ODCID	Response
13	Build It Green, Local Career Fair
21	Rater refers her clients to the EUC Multifamily program if appropriate
30	PG&E Website

b. In what ways is the program appealing to them?

ODCID	Response
13	Did not answer
21	Allows owners to get rebates on the work they plan on doing
30	Allows owners to get rebates on the work they plan on doing

c. In what ways is the program not appealing to them?

ODCID	Response
13	They are skeptical of whether or not the promised or estimated savings from the program are realized and worth the time
21	If the program requires additional services that increase costs and offsetting rebates from programs
30	Their classification of Multifamily building is not clear

d. What keeps owners and managers from having their properties assessed through the program?

ODCID	Response
13	The state of the economy prevents them from making decisions about unnecessary upgrades
21	DK – all clients tend to be interested in these programs
30	The cost of a wholehouse assessment is still too labor intensive and expensive even with rebates so they are not going to do it. Especially if they still have to spend for the upgrades

e. What keeps owners and managers from completing recommended upgrades through the program?

ODCID	Response

13	Landlords do not replace or upgrade anything unless absolutely necessary or personally beneficial to them
21	When the savings after factoring in rebate is still not enough to offset a significant portion of the costs
30	They are not responsible for the utilities therefore they do not have any interest in doing any of the upgrades

Training

15. Did you attend the program-sponsored California Multifamily Existing Building Program Training "CAMFEB"? [IF NECESSARY: The training combines curricula that prepares professionals for both the BPI[42] Multifamily certification exam and the "beta" HERS[43] II Multifamily requirements. An optional fifth day also allows professionals to receive a GreenPoint Rated Multifamily Existing Buildings certification upon successful exam passage]

    [IF YES]

ODCID	Response
1	Yes
3	No
4	Yes
6	Yes
8	Yes
13	Yes
19	Yes
21	Yes
24	Yes
30	Yes
36	No
40	Yes

a. Why did you decide to attend this training?

ODCID	Response
1	To be knowledgeable and qualified in case of future multifamily work
4	Profession is an energy consultant and actively participate in these trainings to stay up to date and knowledgeable about multifamily in case of incoming work
6	multifamily is rater's target sector in profession and is actively participated in trainings related to multifamily
8	To obtain the BPI certification that was not offered in the initial 2010 CAMFEB training
13	Professional development and to see what EUC Multifamily offered

42 (Building Performance Institute)
43 (Home Energy Rater)

ODCID	Response
19	Rater is interested in working with multifamily buildings and training was free
21	To obtain BPI Multifamily certification to work for an related program
24	Professional development. To obtain BPI Multifamily certification and advance knowledge in the general building efficiency industry
30	Curiosity with existing multifamily building practices
40	Career interest and professional development

b. What did you think of this training? Please explain.

ODCID	Response
1	No issues. The program was challenging and subject was surprisingly different than single-family
4	No issues recalled. However, Rater indicated it has been too long and has taken many other courses since to remember CAMFEB Specific Training
6	No issues recalled. However, Rater indicated it has been too long and has taken many other courses since to remember CAMFEB Specific Training
8	Explanation of the rebates during training was confusing for rater. Rater expressed confusion if implementation staff or PG&E is responsible for rebates so if rater were to recommend program to client, she is unsure if the information she is providing will be correct and will not know who to refer client to if issues arise. *"The rebate part of it was hard to understand… getting stuff from PG&E or implementation staff, and its hard if you are trying to give your clients some information about the rebate, I'm not sure if I am giving them the right information"*
13	No Issues
19	No Issues – Rater felt the training was well conducted
21	Program should have focused less on the program requirements because there was not enough hands on experience or field work
24	No Issues – Rater felt the training was well conducted because of actual case studies in curriculum
30	Curricula overly focused on very old buildings using steam systems and energy modeling was in its infancy
40	No issues – Rater does not recall specifics of training

c. In what ways was this training valuable, if at all?

ODCID	Response
1	Learning about the building science and analysis of unique features of multifamily specific buildings. Rating certifications.
4	DK – Rater does not recall specifics of training
6	DK – Rater does not recall specifics of training

ODCID	Response
8	Getting more background behind multifamily buildings and the building science of multifamily existing buildings. Rating certifications.
13	Yes, there was a sense of mentorship during the training. Career advancement and certification
19	Staff was knowledgeable and able to learn a lot under a short amount of time. Rating certifications.
21	Specific examples of multifamily buildings and actual technical discussion of systems within, especially HVAC. Rating certifications.
24	Understanding boiler systems and situations encountered in the field. Rating certifications.
40	Obtaining the BPI Multifamily certification and understanding the Title 24 policy

d. Even though you have not enrolled in the program, do you think the training prepared you for participating in the program if you decide to enroll in the future? Why or why not?

ODCID	Response
1	Not sure; it has been a while since training and have not really applied M multifamily F rater training
4	DK – Rater does not recall specifics of training
6	DK – Rater does not recall specifics of training
8	No – Client's rebate requirements were not explained very well
13	Yes – instructions were clear and trainers were helpful in helping raters understand the program requirements
19	DK – Rater does not recall specifics of training
21	Possibly since a lot of the training was going over the program requirements rather than actual building science
24	Yes – instructions were clear and trainers were helpful in helping raters understand the program requirements
30	Yes – but that is in combination with rater's expertise
40	DK – Rater does not recall specifics of training

e. Is there anything that you think should have been covered in the training that was not?

ODCID	Response
1	More focus on Energy Modeling aspect of the training specifically on how calculations affect final model so rater can account for unique variables in a home or building. Respondent felt the training oversimplified the what is expected in an actual assessment

3	
4	DK – Rater does not recall specifics of training
6	DK – Rater does not recall specifics of training
8	Better follow-up and explanation of available rebates and party responsible for them. “
13	None
19	None
21	More fieldwork related to training
24	None
30	Yes, hands-on exercise of multifamily existing energy modeling
40	None

f. Did you earn certifications by going to the training that you did not have before?

ODCID	Response
1	BPI Multifamily, GreenPoint Multifamily
3	BPI Multifamily, GreenPoint Multifamily
4	DK – Rater does not recall specifics of training
6	DK – Rater does not recall specifics of training
8	None
13	BPI Multifamily, GreenPoint Multifamily
19	BPI Multifamily, GreenPoint Multifamily
21	BPI Multifamily, GreenPoint Multifamily
24	BPI Multifamily, GreenPoint Multifamily
30	BPI Multifamily, GreenPoint Multifamily
40	BPI Multifamily, GreenPoint Multifamily

[IF NO]

g. Why did you not attend this training?

ODCID	Response
3	Probably did but does not remember since this was back in 2010. Rater attended too many similar trainings
36	Did not know about it. Not a rater

16. Did you attend a program webinar that gave you an overview about how to participate in the program?

ODCID	Response
1	Yes
3	Yes
4	No
6	No

ODCID	Response
8	No
13	Yes
19	No
21	No
24	No
30	No
36	Yes
40	No

[IF YES]

i. Why did you decide to attend this webinar?

ODCID	Response
1	It was convenient and company is actively attending webinars about prospective building practice training and rebate programs
3	Interested in Multifamily projects and attended for information session
13	Convenient to attend and learning about the general aspects of program
36	Client referred contractor to program and was attending webinar to get more information

j. What did you think of this webinar? Please explain.

ODCID	Response
1	No issue; provided high level overview of training and EUC program
3	Worth attending to get information on how to participate
13	No issues
36	No issues

k. In what ways was the webinar valuable, if at all?

ODCID	Response
1	Save time by helping respondent determine whether her or her company was eligible in participating in EUC Multifamily program
3	Don't Know
36	Gave a high level understanding of what contractor and client needed to do in order to participate

l. Even though you have not enrolled in the program, do you think the training prepared you for participating in the program if you decide to enroll in the future? Why or why not?

ODCID	Response
1	Not sure; it has been a while since training and have not really applied multifamily rater training
3	No sure; no Multifamily clients available to try and even pursue program
13	Yes – the training was fine
36	Not sure; do not remember specifics of webinar
40	No – because rater claims training does not provide enough training on the field work

[IF NO]

m. Why did you not attend this webinar?

ODCID	Response
4	Respondent was not aware of webinar or does not recall EUC specific webinar since he actively participates in related webinars
6	No time to participate
8	Was not available to participate on day of
19	Was not aware
21	Was not interested in participating in EUC program because of conflict of interest with current employer
24	Was not aware
30	Was not aware
40	Does not recall this specific webinar

17. Is there any additional training or information you would like the program to provide?

ODCID	Response
1	No
4	No
6	Yes
8	Yes
13	Yes
19	No
21	Yes
24	No
30	No
36	No
40	Yes

[IF YES]

e. What sorts of training or information would you like to have? Why?

ODCID	Response
6	Offer mentorship or live field training because it is the best way for someone to learn when they have hands on experience
8	Just clarification or follow-up on what rebates are out there and who is overseeing them and how rater and potential clients could participate.
13	More sessions on legal aspects surrounding the program, networking event during training
21	More technical training and hands on experience with multifamily building science
40	Actual field work exercises

f. How is this training or information valuable to you?

ODCID	Response
6	Will allow rater to quickly pick up expertise and knowledge about how to rate buildings
8	Will allow rater to push clients to pursue energy efficiency related programs where applicable
13	It would provide new raters traction to immediately gain experience and traction in program
21	Practical for current profession
40	Will provide a practical experience of what is involved in rating and participating in the program

Closing

18. Is there anything else you believe is important for me to know about the program based on the conversation we've had today?

ODCID	Response
1	New construction market is more active right now. The program (EUC-MF) has a good reputation and will likely pick up as more first time clients go through the program.
3	Remove Requirement: "Removal of combustion appliances from thermal envelope" or else don't expect any multifamily clients to pursue the program
4	None
6	None
8	None
13	None
19	None
21	None
24	None
30	None
36	None
40	None