



Home Upgrade
Energy Upgrade California®

2018 Participant Handbook

For Pacific Gas and Electric Company (PG&E) territory
and PG&E - SoCalGas® shared territory

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Welcome to Energy Upgrade California® Home Upgrade, an innovative program that advances energy efficiency in existing homes.

As a program participant, you are critical to the success of Energy Upgrade California® Home Upgrade. Your expertise enables Customers to make their homes more energy efficient and helps the State reach its greenhouse gas reduction goals.

Home Upgrade will also help you—by providing marketing support to grow your business and providing training and education to improve the quality of the services you provide.

This handbook provides information about the program, and the processes and procedures you need to follow to perform energy efficiency upgrade projects in the program. The handbook serves as a supplement to the training and other in-person workshops that will be offered. Think of it as a roadmap for a sustained relationship with Energy Upgrade California!

The Participant Handbook is a living document. PG&E, SoCalGas® and Build It Green can revise the document at any time during the term of the program. The most current version will be available at www.homeupgrade.org.

The Energy Upgrade California® Home Upgrade program provides assistance and incentives for home-improvement projects that can reduce energy use and make homes more comfortable. This statewide program is managed locally by utilities and regional energy networks and directed by the California Public Utilities Commission in collaboration with the California Energy Commission. Funding comes from utility customers under the auspices of the California Public Utilities Commission. Incentives are offered on a first-come, first-served basis and are effective until funding is expended or the program is discontinued. Programs may be modified or terminated without prior notice. ©2018 Energy Upgrade California. Trademarks are property of their respective owners. All rights reserved.

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Chapter 1 About the Program

Energy Upgrade California® is an initiative to help Californians take action to save energy and conserve natural resources, help reduce demand on the electricity grid, and make informed energy management choices at home and at work. The Energy Upgrade California® Home Upgrade program provides assistance and incentives for projects that reduce energy use and make homes more comfortable.

This statewide program is administered locally by investor-owned utilities (IOUs -- PG&E, SCE, SoCalGas®, and SDG&E) and Regional Energy Networks (RENs -- BayREN and SoCalREN). It is supported by an alliance of the California Public Utilities Commission, the California Energy Commission, California IOUs, RENs, local governments, businesses, and nonprofits to help communities meet state and local energy and climate action goals. Funding comes from investor-owned utility customers under the auspices of the California Public Utilities Commission.

PG&E and Build It Green work together to implement the Program. Roles have been defined as follows:

Build It Green

- Implement the Program on behalf of PG&E and/or SoCalGas®
- Recruit, enroll, and train high quality home performance contractors
- Ensure appropriate credentials, licensing, and insurance are current
- Mentor contractors and encourage additional skills & training
- Develop and maintain project tracking systems
- Conduct technical and administrative reviews of rebate applications
- Submit rebate applications to PG&E for payment
- Conduct quality control and field verification

PG&E and/or SoCalGas®

- Report Program outcomes to the CPUC
- Process rebate and incentive payments
- Conduct quality control and field verification
- Lead Program design and measure requirements
- Lead customer marketing and communication
- Coordinate with BayREN, local governments and industry stakeholders

Program Overview

Energy Upgrade California® Home Upgrade is a *whole house* approach to energy efficiency, based upon building science principles. Many homes—particularly those built before Title 24 was enacted in 1978—can have leaky building enclosures, causing homeowners to use more heating or air conditioning to maintain a comfortable indoor temperature. Home Upgrade encourages homeowners to think about their house as a complete system, a “whole house,” rather than focusing on individual elements. The concept is to seal and insulate the house first, and then install heating and cooling systems that are correctly sized for the upgraded condition of the home.

Energy Upgrade California® Home Upgrade has four key components:

1. Educate customers on the house-as-a-system concept to promote the *whole house* approach
2. Install measures in accordance with the *whole house* approach to reduce customer energy use
3. Offer incentives and financing to reduce the upfront cost of energy efficiency projects
4. Educate contractors and raters in applied building science, quality installation of whole house measures, as well as sales and marketing to improve installation services provided

Energy Upgrade California® Home Upgrade currently only offers an Advanced Home Upgrade pathway (the “basic” Home Upgrade pathway was discontinued in May 2018). Advanced Home Upgrade utilizes energy modeling software to enable comprehensive or “deep” energy retrofits..

Customer Benefits include:

- Lower energy bills
- More comfortable home
- Enhanced indoor air quality
- Increased home value
- Reduced impact on the environment

Program Administration and Implementation in Shared Service Territory

Energy Upgrade California® Home Upgrade is administered in certain areas by multiple IOUs. For those program participants in PG&E-SoCalGas shared territory (primarily Kern, Kings, San Luis Obispo and Santa Barbara Counties) implementation is performed on behalf of both IOUs by Build It Green. This allows for streamlined rebate application submission and payment process for via a single implementer. However, natural gas and combustion appliance safety issue inquiries (per *NGAT Action Guidelines*, *Whole House Combustion Appliance Safety Test Procedure* and/or *SoCalGas Inspection Guidelines*) should still be directed to the appropriate Gas Utility Service provider in the territory that such issues may be encountered on a site-by-site basis. Gas service department contact phone numbers can be

found on the Test Measurement Form (see online [Document Library](#)) that is required for every Test-In and Test-Out assessment on every project.

For the purpose of reducing descriptive complexity, unless otherwise noted, this document should be interpreted to apply to both PG&E and SoCalGas® when being used to refer to circumstances in the PG&E-SoCalGas shared territory and to PG&E only in the remainder of PG&E service territory that is not shared with SoCalGas®.

Rebates and Incentives

Energy Upgrade California® Home Upgrade provides incentives and rebates up to \$5,500 to encourage program participation. Additional information about the rebates and incentives can be found in “Chapter 4 Advanced Home Upgrade Detailed Specification” of this handbook.

Local governments may offer additional rebates for water efficiency, renewable energy and green building upgrades. Rebates vary by city and county. Tax credits may also be available. Program participants can find information on local rebates and eligibility requirements at www.energyupgradeca.org.

Chapter 2 Participant Enrollment

Energy Upgrade California® Home Upgrade can augment the services of companies committed to home performance or provide a solid foundation for those transitioning from HVAC- or insulation-focused projects to more *whole house* based home performance.

The Program provides marketing support including: listing in the Participant Directory on the PG&E website pge.com/homeupgrade, listing in the Participant Directory on the Energy Upgrade California website energyupgradeca.org, referrals from the Energy Upgrade California® program, marketing materials, program webpage on PG&E website, and co-op marketing resources and materials. The Program also provides training and up to five free mentoring sessions to help train your staff and improve your installations.

To enroll in the Program, your company must meet the enrollment requirements, execute the Contractor (or Rater) Participation Agreement, and hold an all-staff kickoff meeting.

Contractor Enrollment Requirements

For contractors to enroll in Energy Upgrade California® Home Upgrade, you and/or your company must meet the Enrollment Requirements as described below.

Table 1. Contractor Enrollment Requirements

ADVANCED HOME UPGRADE	
CSLB License and proof of licensure	<p>Class “B” General Building <i>or</i></p> <p>Class “C” license appropriate to project scope and installation. Acceptable licenses include C-2, C-4, C-20 and C-36. Other C licenses may be accepted on a case by case basis.</p> <p>Proof of licensure includes: license number, classification, certification date and expiration date.</p> <p>License status and compliance with CSLB contractor bond requirements will be verified online and checked yearly for compliance.</p>
Insurance and Bonding	<p>Insurance certificates for general commercial liability, auto liability, workers compensation and bonding.</p>

	Liability Insurance must name “Build It Green” and “PG&E” as additional insured.
2 years of Work Experience	<p>Screen shot of 2-year history for relevant CSLB license (services provided and equipment, products, or materials installed as indicated on CSLB license)</p> <p style="text-align: center;">OR</p> <p>Documentation of BPI Goldstar accreditation, two years of similar work experience, and two professional references</p>
Training	<p>All Staff Kick-off Meeting to introduce Company to key Build It Green staff and review program participation</p> <p>All BPI Professionals (employee, subcontractor or consultant) performing Combustion Appliance Safety testing complete Advanced Technical Training including PG&E Make Safe Procedure. Training must be renewed every two years (qualifies for BPI CEU’s)</p> <p>Company leadership and install crew supervisors complete Home Upgrade Core Training (Required for contractors without BPI on-staff, recommended for all others) Training must be renewed every two years (qualifies for BPI CEU’s)</p>
Certifications and Proof of Certification	<p>Contractor: BPI* certified employee, subcontractor or consultant performing Combustion Appliance Safety testing</p> <p>Rater: HERS II Whole House Rater, BPI*</p> <p>Proof of certification includes: copies of certification identification cards, certification number and expiration dates</p>
Combustion Appliance Safety (CAS) Testing	<p>CAS and diagnostic testing performed by BPI certified employee or an employee of a BPI GoldStar company.</p> <p>Professional performing the CAS Test (employee, subcontractor or consultant) must complete Advanced Technical Training including PG&E Make Safe Procedure.</p>

Agreement to Terms & Conditions in Contractor Participation Agreement	<p>Signed Contractor Participation Agreement and agreement to all terms and conditions.</p> <p>Company represents and warrants that employees with access to Customer homes have no prior felony or misdemeanor conviction as well as no lawsuit or lien filed against the company or its leadership within the past 7 years.</p> <p>Program participants conduct background checks ‘at-hire’ and annually on all employees with access to Customer homes.</p> <p>Provide list of all Technicians and Sales personnel</p> <p>See Participation Agreement on the Program portal website www.homeupgrade.org.</p>
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* see certifications that qualify below

Rater Enrollment Requirements

Raters may enroll as an “Individual Rater” when working independently, or as a “Rater Company” in Energy Upgrade California® Home Upgrade. You and/or your company must meet the following Enrollment Requirements in Table 2 below.

Table 2. Rater Enrollment Requirements

RATER REQUIREMENTS	
Certifications and Proof of Certification	<p>HERS II Whole House Rater certification <i>and</i></p> <p>BPI certification*</p> <p>Proof of certification includes: copies of certification identification cards, certification number and expiration dates</p>
Insurance and Bonding	<p>Insurance certificates for general commercial liability, auto liability, workers compensation and bonding.</p> <p>Liability Insurance must name “Build It Green” and “PG&E” as additional insured.</p>
2 years of Work Experience	<p>Documentation of BPI Goldstar accreditation, two years of similar work experience, and two professional references</p>
Training	<p>Company leadership (owners, managers) attends a Program Participation Workshop</p> <p>All BPI Professionals (employee, subcontractor or consultant) performing Combustion Appliance Safety testing complete Advanced Technical Training including PG&E Make Safe Procedure</p> <p>Recommended for Rater Companies: Company leadership and field assessors complete Home Upgrade Core Training</p>
Combustion Appliance Safety (CAS) Testing	<p>CAS and diagnostic testing performed by BPI certified employee or an employee of a BPI GoldStar company.</p> <p>Professional performing the CAS Test (employee, subcontractor or consultant) must complete Advanced Technical Training including PG&E Make Safe Procedure.</p>
Agreement to Terms &	<p>Signed Contractor Participation Agreement and agreement to all terms and conditions.</p>

Conditions in Contractor Participation Agreement

Company represents and warrants that employees with access to Customer homes have no prior felony or misdemeanor conviction as well as no lawsuit or lien filed against the company or its leadership within the past 7 years.

Program participants conduct background checks 'at-hire' and annually on all employees with access to Customer homes.

Provide list of all Technicians and Sales personnel

See Participation Agreement on the Program portal website www.homeupgrade.org.

Execute Rater-Contractor Collaboration Form for each Participating Contractor and Rater partnership

* see certifications that qualify below

Building Performance Institute (BPI) Certification

BPI professional certifications that qualify for enrollment requirements in the Program include:

- Building Analyst
- Envelope Professional
- Manufactured Housing
- Heating
- Air Conditioning and Heat Pump

A BPI professional certification that includes a Combustion Appliance Safety (CAS) field examination is required for conducting CAS testing. Please refer to www.bpi.org for more detailed information.

BPI Gold Star is accepted for Participating Contractors and Raters, provided all required trainings are completed by the individuals performing CAS testing. Please refer to the www.bpi.org website for more specific information on how to enroll in the Gold Star Program.

Required Trainings

Energy Upgrade California® Home Upgrade may require substantial training and investment to succeed. The Program provides training to ensure Program participants success. Attendance at the following training events is a condition for enrolling in the program:

- Program Participant Staff All Hands Meeting Home Upgrade Core Training and/or Advanced Technical Training including PG&E Make Safe Procedure
- Completion of an all-staff kickoff meeting. Coordinate scheduling of the all-staff kickoff meeting with your Contractor Engagement Manager.

Please visit www.homeupgrade.org for a calendar of upcoming workshop and training events.

Program Participant Staff All Hands Meeting

Company leadership and staff must attend an All Hands Meeting to gain an overview of Program requirements and rules including: the application process, rebate and incentive levels, quality assurance and field verification requirements, project submission, and rebate processing.

Home Upgrade Core Training

In this course, you will learn the fundamentals of building science and gain practical insight into installing the core measures in the Home Upgrade Program, including;

- How to find air leaks in the building shell and properly seal them
- How to insulate the attic plane
- Basic blower door and duct testing procedures
- Essential combustion appliance safety testing practices

Course time is evenly split between classroom and hands-on field learning at PG&E's Energy Training Center in Stockton and other potential training facilities throughout PG&E service territory. A training schedule is available on the Events calendar at www.homeupgrade.org/events.

This training is required for all companies without a BPI-certified professional on staff and is strongly recommended for all participants. This course is three-days in duration, is eligible for 10.5 BPI CEUs, and free to participating contractors.

Advanced Technical Training

The course focuses on the PG&E Whole House Combustion Appliance Safety Test Procedure which builds upon BPI combustion appliance safety protocols and standards. In addition, the course focuses on actions to resolve combustion appliance safety issues in PG&E service territory, based on PG&E Natural Gas Appliance Testing (NGAT) Action Guidelines and PG&E Make Safe Procedure. A training schedule is available on the Events calendar at www.homeupgrade.org/events.

This training is required for all individuals who perform Combustion Appliance Safety testing in PG&E service territory. More information on the *Whole House Combustion Appliance Safety Test Procedure*, *NGAT Action Guidelines* and the *Make Safe Procedure* can be found at www.homeupgrade.org/resources/documents. This course is two-days in duration, is eligible for 8 BPI CEUs, and free to participating contractors.

Participation Agreement

Participating contractors must execute (sign and date) the *Contractor Participation Agreement*, scan and upload to the online enrollment portal. See Participation Agreement on the Program portal website www.homeupgrade.org/resources/documents.

Subcontractors

Participating contractors must hold the primary contract/scope of work with the Customer for all of the energy upgrade measures installed on a given project. Subcontractors working for Participating contractors must meet enrollment requirements as described above and must follow all Program processes and procedures.

Required and Recommended Equipment

All Program participants should have the following equipment available for diagnostic testing. Successful participation is dependent on having all the equipment needed to conduct a comprehensive and accurate home diagnosis.

Required diagnostic/testing equipment:

- Blower Door and Duct Tester Manometer(s) - digital pressure and flow gauge
- Digital Carbon Monoxide or Combustion Analyzer equipped with NOx filter, displays 'air free' and 'as measured', 1ppm resolution, +/- 5% or 10ppm accuracy
- Digital Combustible Gas Leak Detector (UL 913, tick rate/tone change indicator and LEL percentage display)
- Industry-approved Gas Leak Detector Solution 'bubble solution'
- Diagnostic smoke or hand mirror
- Personal CO monitor
- Duct mask/blue painters' tape

- Digital camera
- Small flashlight
- Ambient thermometer

Recommended diagnostic/testing equipment:

- Ladders (step and telescoping)
- Digital psychrometer
- Flow hood
- Contact moisture meter
- Exhaust fan flow meter
- Pressure pan(s)
- Flow plate
- Thermal imaging (Infrared) and/or Duct cameras

Good sources for equipment purchase include the Energy Conservatory (www.energyconservatory.com) and Inspector Tools (www.inspectortools.com).

In-Field Mentoring

The purpose of mentoring and feedback is to ensure new Program participants follow Program processes and procedures, including Combustion Appliance Safety testing protocols and procedures, and provide quality installation services to Customers. Each Participating Rater or Contractor is eligible for up to five mentoring sessions, free of charge. All personnel (sales, management and installation staff) are strongly encouraged to participate in the in-field mentoring session.

In-field mentoring may be scheduled to coincide with Test-Out assessments. To schedule field mentoring, first identify an available home, then contact Build It Green (510-590-3360 x607 or fieldqc@homeupgrade.org) to schedule an appointment.

Chapter 3 Customer Eligibility

Customers must be a PG&E Electric and/or PG&E Gas or SoCalGas® Customer as verified by an active Service Account ID (SAID). SAIDs can be found on a Customer's bill. An example customer bill is available for reference at www.homeupgrade.org/resources/documents.

Advanced Home Upgrade Requirements:

- Existing equipment, distribution system or building assembly must be upgraded to more efficient equipment, distribution system or building assembly of the same type and must be installed to meet or, ideally, exceed Title-24 code requirements

Fuel Switching

Switching an appliance, water heater or HVAC-equipment from electric to gas or gas to electric, called 'fuel-switching', is not eligible for a rebate in Advanced Home Upgrade.

Customer Utility-Supplied Fuel Type

Customers must receive gas or electric service from PG&E and/or SoCalGas® with respect to the measure installed for any given project to be eligible for a rebate. For example, a customer must receive gas service from PG&E and/or SoCalGas® to qualify for a gas water heater rebate. A customer must receive electric service from PG&E to qualify for an electric water heater rebate. PG&E electric Customers who use propane fuel for water or space heating are only eligible for rebates for electric savings.

Home Specifications

Eligible homes:

- Single family **detached** homes
- Manufactured, modular or factory built homes transported and assembled on site in conformance with state and local building code. In addition, homes must be greater than 320 square feet in size.
- Mobile homes on a chassis and axle constructed under HUD codes or that have a State of California Community Services Department sticker indicating status as a licensed mobile home do not qualify.
- Single-family **attached** homes including townhomes, condominiums, and apartments up to four units (2-4 Units) are eligible for Advanced Home Upgrade.

Ineligible Homes:

- Buildings with five (5) or more units with attached or shared building assemblies are **not eligible for this Program**. These homes may be eligible for the Energy Upgrade California® Multifamily program please see www.energyupgradeca.org or contact Build it Green for more information.

2-4 Unit or Single-Family Attached Homes

“2-4 Unit” (Single-family attached) homes are eligible for Advanced Home Upgrade. To participate, these projects must meet the following criteria:

- All property owners and units must agree to participate in diagnostic and Combustion Appliance Safety (CAS) Test-In and Test-Out. CAS tests can confirm if any units are all electric. CAS failures identified in any unit must be corrected in order for any unit in the 2-4 Unit building to be eligible for a Program rebate.
- Each unit must be metered separately for electric and gas service and submit a separate application.
- Upon job completion, all combustion appliances must be located outside the building envelope, power-vented or closed/sealed-combustion, or sealed off from the living space such that there is adequate combustion air and combustion gases are appropriately exhausted.

Renters and Property Owners

The Program is open to both property owners and renters with permission from the property owner. PG&E can only issue rebates or incentives to the PG&E Utility Account Holder on record. If the Property Owner is not the PG&E Utility Account Holder (renter), the Account Holder may sign a Customer Incentive Payment Assignment (CIPA) form to transfer the rebate to the Customer. The CIPA Form is available for download at www.homeupgrade.org/resources/documents.

Contractor Incentive Payment

PG&E can only issue rebates or incentives to the PG&E Utility Account Holder on record. The Account Holder may sign a Customer Incentive Payment Assignment (CIPA) form to transfer the rebate to the Participating Contractor. Please note that contractors that do utilize the CIPA form to receive payment directly are still required to disclose the amount of the final, approved rebate amount to their customers. The CIPA Form is available for download at www.homeupgrade.org/resources/documents.

Previously Installed Measures

If a Customer has previously installed and received a rebate from PG&E for any measure in the last six (6) years, that same type of measure would not be eligible for inclusion in an Advanced Home Upgrade project.

Additionally, Customers are not eligible for single-measure rebates from PG&E for the same type of measure as included in a project rebated under this Program within the last six (6) years. For a list of available single-measure rebates and incentives visit www.pge.com/rebates.

It is the responsibility of the participating Contractor or Rater to ensure the Customer is eligible for a rebate or incentive. PG&E and Build It Green are not liable for projects that are not eligible. Please contact Build It Green (at 510-590-3360 x606 or info@homeupgrade.org) **before** starting a project if you have any questions regarding customer eligibility.

Chapter 4 Advanced Home Upgrade Detailed Specification

Advanced Home Upgrade requires installation of at least two eligible measures (see Table 3 below). Additionally, each project must achieve at least a 10% modeled improvement in energy savings. All building vintages are eligible if upgrade opportunities exist.

All Advanced Home Upgrade projects require verification of the existence of at least one CO Alarm or Detector (see Chapter 5 for specific requirements).

Advanced Home Upgrade requires diagnostic Test-In and Test-Out assessments consistent with *Building Performance Institute Standard Practice for Basic Analysis of Buildings* and *Whole House Combustion Appliance Safety Test Procedure for Pacific Gas and Electric Company (PG&E) Home Upgrade Program*, HERS II and BPI. ‘Test-in’ helps define an energy use baseline and comprehensive work scope including repair of existing health or safety issues discovered. ‘Test-out’ documents that specified improvements have been properly sized and installed, performance-based measure data is tested and modeled, and that safety tests have been successfully completed.

It is recommended that measures exceed any/all Program Standards (typically these are above-code) specified in Table 5 below. At a minimum, installed measures must be an improvement upon existing **and** meet current Title 24 requirements.

Modeling Software Requirements

Participating Contractors and Raters must use approved building energy-modeling software and input values methodology to model performance and estimate energy savings for each job. Currently approved Program software includes:

- OptiMiser (www.optimiserenergy.com)
- Snugg Pro (www.snuggpro.com)

Approved software may change without notice. Please contact Build It Green at 510-590-3360 x606 or info@homeupgrade.org for an update on currently approved software, prior to purchasing software services.

2-4 Unit In-Field Mentoring

Each BPI-certified professional is required to complete an in-field mentoring Test-In and Test-Out with Build It Green on their first 2-4 Unit project. Please notify Build It Green at least 10 business days in advance of scheduled Test-In/-Out. Advance notice maybe provided via email to fieldqc@homeupgrade.org.

Table 3. Advanced Home Upgrade Measures and Technical Specifications

Measure Description	Program Standard
Wall insulation	R value \geq 13 (2x4 framing) or R value \geq 19 (2x6 framing), installed per CEC QII Standards.
Attic Insulation	R-44 or better, installed per CEC QII standards.
Floor insulation	R value \geq 19, installed to full-joist thickness, per CEC QII Standards.
Whole building/envelope air sealing and Ventilation	0.35 ACHn target, 0.5 ACHn minimum performance, achieved in accordance with BPI standards and ventilated per ASHRAE 62.2 (installation of balanced Heat Recovery Ventilation recommended)
Infiltration reduction measures (air barriers)	Install to manufacturer's specifications. Must result in measureable air infiltration reduction.
Exterior Windows	ENERGY STAR® compliant, air leakage less than 0.3 CFM/ft, installed per manufacturer's instructions
Window film	Per manufacturer's installation guidelines. SHGC meets or exceed Energy Star requirements.

HVAC equipment replacement	<p>Central natural gas furnace: AFUE \geq 94%</p> <p>Direct-vent natural gas heater: AFUE \geq 80%</p> <p>Split AC: SEER \geq 15, EER \geq 12.8</p> <p>Packaged AC: SEER \geq 15, EER \geq 12.9</p> <p>Split heat pump: \geq 15, EER \geq 12.8, HSPF \geq 8.7</p> <p>Packaged heat pump: SEER \geq 15, EER \geq 12.9, HSPF \geq 8.2</p> <p>All systems properly sized according to ACCA Manuals J, D, and S with room-by-room air flows and register types identified. Target 800 sq. ft. or more per ton of cooling.</p> <p>Refrigerant charge - Restore to stamped charge and install locking caps. Requires CF-3R submittal by certified HERS rater.</p> <p>System air flow verification - <i>Minimum</i> 350 CFM/ton (target 450 CFM/ton or higher where appropriate). Requires CF-3R submittal by certified HERS rater.</p> <p>System fan wattage verification - <i>Maximum</i> 0.58 watts/CFM (target 0.25 watts/CFM or less where appropriate). Requires CF-3R submittal by certified HERS rater.</p>
Duct insulation	R-8 or greater.
Duct sealing	Reduce duct leakage to 10% or less of nominal or actual air flow of the heating or cooling system.
HVAC duct replacement/retrofit	Designed and sized per ACCA Manual D; ducts located in unconditioned spaces shall be buried in insulation or insulated to minimum R-8; duct leakage shall not exceed 5% of nominal or actual air flow; meet or exceed Title 24 requirements.
Radiant/hydronic heating	Per manufacturer's installation guidelines. High-efficiency heat-source(s) and insulated distribution systems to points of use recommended.
Lighting	Meet or exceed Title 24 "High-Efficacy" definition and ENERGY STAR® standards (when applicable).

Domestic hot water	Exceed Title 24 requirements or ENERGY STAR® standards when applicable (excludes solar water heating for this rebate Program).
Tankless water heater	Per manufacturer’s installation guidelines. Insulated distribution systems to points of use recommended.
Primary refrigerator replacement/ installation	ENERGY STAR® certified. Per manufacturer’s installation guidelines.
Pool Pump	CEC-approved variable speed primary pump (model high-/low-speed electric savings only). Installation by Certified Aquatic Equipment Installer (CAEI). See pge.com/poolpumps for a list of eligible pool pumps.
Cool roof	Minimum aged solar reflectance and thermal emittance or minimum SRI per Title 24; Cool Roof Rating Council (CRRC) certified.

Rebates and Incentives

Advanced Home Upgrade offers incentives based on modeled energy savings at the rate of \$2.00 per Therm and \$0.75 per kWh. Incentives are only offered for the fuel type supplied by PG&E and are capped at 50% of the total project costs (materials and labor). Reference Chapter 3 for additional information.

Performance kickers are offered for energy-modeled site-savings percent improvement from the existing baseline. Kickers start at \$550 for 10% improvement, increasing \$300 for each 5% improvement up to 25%. Kickers increase to \$2,500 at 30% improvement, increasing by \$500 per for each 5% improvement up to a maximum of \$4,000 for 45%+ savings. Performance kickers will be prorated based on the fuel-type the customer receives from PG&E. For example, if a Customer only receives PG&E electricity and 80% of the percent improvement is due to electricity savings, 80% of the improvement kicker will be awarded to the customer.

Customers who receive both gas and/or electric service from PG&E are eligible for the following Advanced Home Upgrade rebates in Table 4 below:

Table 4. Advanced Home Upgrade Incentives

Energy Savings Incentive	+	Percent Improvement	Percent Improvement Kicker	=	Total Incentive
		10%	\$550		
		15%	\$850		
		20%	\$1,150		
\$0.75/kWh		25%	\$1,450		
\$2.00/therm	+	30%	\$2,500	=	Total Incentive
		35%	\$3,000		
		40%	\$3,500		
		45%+	\$4,000		

Chapter 5 Health and Safety

Combustion Appliance Safety

Combustion appliance safety is an integral part of the Energy Upgrade California® Home Upgrade program. The Program has adopted core Combustion Appliance Safety (CAS) protocols from BPI and the PG&E *Natural Gas Appliance Test (NGAT) Action Guidelines* and the *PG&E Make Safe Procedure* to expedite gas safety calls to PG&E Gas Service Representatives. Reference PG&E’s *Whole House Combustion Appliance Safety Test Procedure* for Program-specific CAS protocols. Visit the [Document Library](#) at www.HomeUpgrade.org for more information on any of the above referenced documents.

All work performed in the Program requires CAS Test-In before installation or repair and CAS Test-Out after all installation. CAS testing is also required prior to leaving the job site *any* time measures are installed that affect the building infiltration or pressure dynamics of the home. Contractors or Raters that fail to complete CAS testing as specified pose a risk to Customer safety and face immediate dismissal from the program.

When any measures are installed or repairs are performed during the project, a CAS test must be performed prior to leaving the job site for the day, and any failures must be repaired. At the conclusion of the project, a final CAS test-out must be performed and accompanied with a signed and dated SQA form matching the test-out date.

Measures that require Test-In and Test-Out are defined below:

Table 5. Health/Safety and Diagnostic Testing Requirements

Measure Installed	CAS Test	Blower Door Test	Duct Test and/or CF-3R	Appliance Ambient CO-Test	None/Not-Applicable
Whole Building Air Sealing	X	X			
Attic Insulation & Plane Air Sealing	X	X			
Duct Sealing	X	A	X		
Duct Insulation			X		

Duct Replacement	X	A	X	
Wall Insulation	X	X		
Floor Insulation	X	X		
Windows	X	X		
Gas Central Furnace	X	A	X	X
Gas Wall Heater	X			X
Central Air Conditioner	F	A	X	
Gas Storage Water Heater	X			X
Gas On-Demand Water Heater	X			X
Electric Storage Water Heater				X

Table Color Key: X = Required

F = Required if paired with a gas furnace (split or packaged)

A = Required for Advanced Home Upgrade for 'Duct Leakage to Outside'

Safety and Quality Acknowledgement Form

A Safety and Quality Acknowledgement (SQA) form is required to confirm that a combustion appliance safety test was completed at Test-Out, after **all** installation and/or repair work is completed.

At the completion of the project and the final CAS Test-Out, the Customer shall sign and date the SQA Form. The individual signing the SQA form must be:

- 18 years of age or older,
- present for the CAS test, and
- the PG&E Account Holder, Customer (signatory on the job contract), property owner, renter, or occupant of the home.

Additionally, the participating contractor and BPI-certified assessor are required to sign and date sections pertaining to their work. Rebate applications will not be approved until this completely filled-out, signed and dated form has been received and verified by Build It Green. **Contractors or Raters that fail to complete CAS tests or the SQA form as specified pose a risk to Customer safety and face immediate dismissal from the program.** Visit the [Document Library](#) at www.homeupgrade.org for more information or to download the above referenced document.

Heat Producing Devices

Heat Producing Devices include but are not limited to can lights, exhaust fans and appliance flues. Heat Producing Devices that are not specifically Insulation Contact (IC) rated, wire that carries electrical current, or vent pipe that conveys hot flue gases into and through an attic can pose a fire risk to homes with attic insulation. Contractors must complete a Heat Producing Devices Verification on the SQA form (see above description) when insulating a ceiling, adding a heat producing device in an attic with existing insulation, or the ceiling has any heat producing devices penetrating the ceiling plane.

Carbon Monoxide Detectors

To comply with CA SB-183 (the "Carbon Monoxide Poisoning Prevention Act") all projects, must include permanent installation of at least one CO alarm meeting UL-2034 or CO detector meeting UL-2075, installed according to manufacturer's instructions in all dwelling units intended for human occupancy. Existing CO alarms or detectors less than five years old that meet code requirements are allowed.

For more information, visit the California State Fire Marshal website at www.fire.ca.gov or for specific CO device information, osfm.fire.ca.gov/strucfireengineer/strucfireengineer_bml.php.

Participant Health and Safety

Participating Contractors and Raters must abide by BPI health and safety standards, carry required documentation (e.g., licenses, certifications, Materials Safety Data Sheets [MSDSs], etc.) and use all necessary personal safety equipment required by federal, state and local laws, including, but not limited to, the "Occupational Safety and Health Standards" implemented by the U.S. Department of Labor (OSHA) and the California Division of Occupational Safety and Health (Cal-OSHA).

For more information, visit Cal-OSHA at www.dir.ca.gov/title8/sub4.html or OSHA at www.osha.gov/law-regs.html. For OSHA and Cal-OSHA occupational exposure limits visit www.osha.gov/dsg/annotated-pels/tablez-1.html.

Hazardous Materials

Program participants may encounter hazardous materials while completing work. If any hazardous materials are encountered during the course of a project, only Program participants with the required certification may remove, dispose, abate or remediate hazardous materials. Certification in the

identification, removal, disposal, abatement and remediation of hazardous materials is outside of the scope of the Program.

Program participants shall be solely responsible for the identification, removal, disposal, abatement and/or remediation of hazardous materials encountered on a job site. Neither Build It Green nor PG&E shall have any liability arising out of, resulting from or regarding a Program participant's detection, identification, inspection, removal, disposal, abatement, and/or remediation of hazardous materials.

Under current California state law, aerosol cans, batteries, paint, stains, thinners, and solvents are considered hazardous and cannot be placed in the trash or recycled using curbside recycling Programs. They must be recycled by a specialty recycler. Visit www.dtsc.ca.gov/HazardousWaste/UniversalWaste/HHW.cfm for a list of Household Hazardous Waste Collection Facilities.

Installation Best Practices for Health and Sustainability

An energy upgrade project can be enhanced by including measures that enhance indoor air quality, water efficiency, resource conservation, and possible environmental advantages based on the home's location.

Indoor Air Quality: In addition to combustion safety concerns, air tight homes may potential hazards as a result of existing building materials that emit toxic particles and can impact occupant health. It is recommended that Program participants incorporate low toxicity or low-VOC materials and mechanical ventilation into upgrade projects to mitigate potential toxicity of new or existing building materials.

For reference:

- California's Residential 01350 standard for testing building product emissions
- 30-percent (or better) post-consumer recycled content in insulation products
- California Air Resources Board (CARB) composite wood products
- Greener Options for Fiberglass and Cellulose Insulation

Water Efficiency: Lower hot water consumption translates to lower energy and water bills. Lower water consumption also translates to reduced energy required to pump water for distribution and reduced energy and other inputs required at water treatment facilities.

Many municipal water districts offer rebates and incentives for water efficiency measures, which can be combined with an energy upgrade to offer greater levels of incentives and value to Customers.

Resource Conservation: This element of green building addresses issues and approaches that contribute to a green building certification or label.

- Proper handling of household hazardous waste (lead, asbestos, mercury, etc.)
- Recycled content materials (e.g. post-consumer recycled insulation)
- Waste Management Plan – may be required for major upgrades and remodels

For more information regarding beyond-code green building standards and practices, visit the CALGreen website at www.bsc.ca.gov/Home/CALGreen.aspx.

For green building certification program information, including detailed best-practices, visit Build It Green at www.builditgreen.org/greenpoint-rated (California-specific certification standard) or LEED for Homes www.usgbc.org/guide/homes.

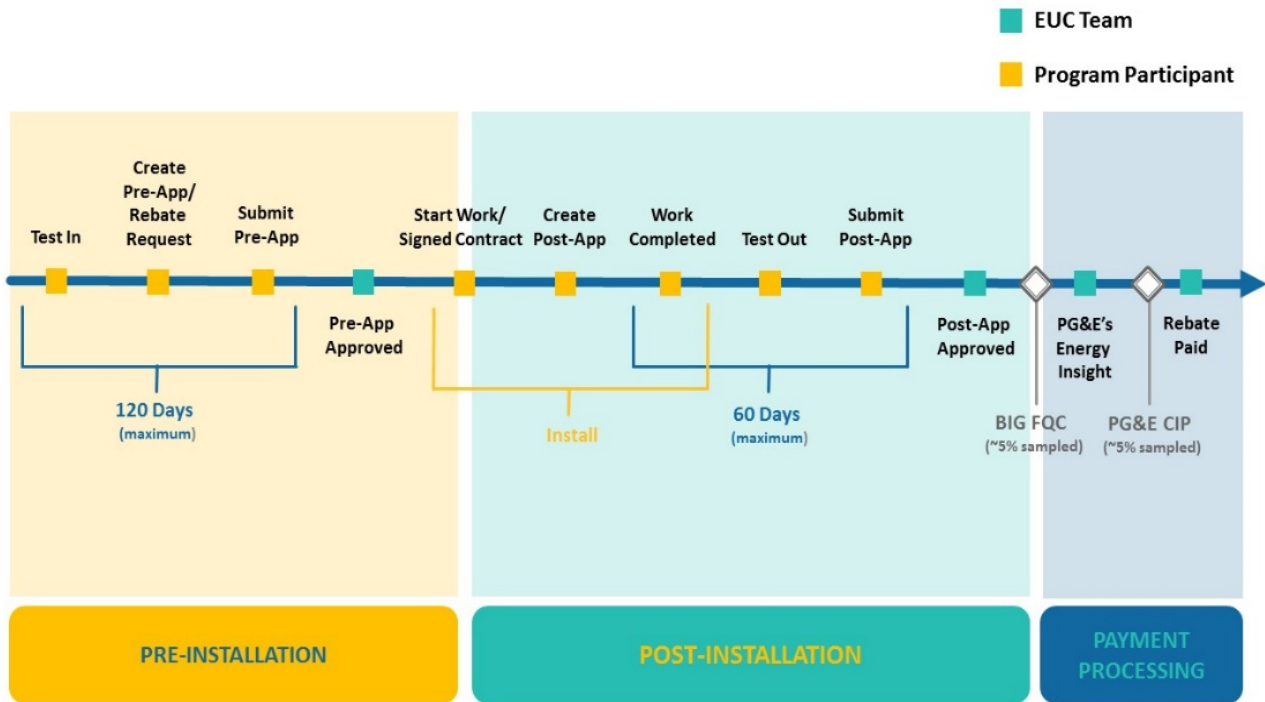
Chapter 6 Job Completion and Rebate Application Submission

Advanced Home Upgrade requires a pre-installation and post-installation submission for each project. Participating Contractors will submit rebate applications on behalf of the Customer. The purpose of the rebate application is to:

- Confirm project is eligible for Program incentives
- Document that the work was performed safely and in accordance with all applicable laws, best practices and Program requirements
- Demonstrate that project measures are installed
- Provide all relevant data to PG&E for program reporting and energy savings claims

We understand the collection and documentation of this data may be out of the scope of your regular business practices. The process is illustrated in Figure 1 below.

Figure 1. Advanced Home Upgrade Application-Submission Process



Test-In Assessment

Before starting the project, complete a Test-In assessment, including Combustion Appliance Safety (CAS) test and any required building or duct leakage diagnostic tests. Enter measured and observed data on the required Test Measurements form.

For 2-4 unit buildings, ensure that a Test-In assessment is completed for all units. Take pictures to document uncommon or unique situations. Refer to the “Combustion Appliance Safety” section of “Chapter 5 Health and Safety” of this document for specific testing requirements.

Develop Scope of Work

Develop a proposed scope of work that meets Program requirements and measure specifications. Include correction of any combustion appliance safety issues in your proposal. All combustion appliance safety repairs must be corrected in order to receive a rebate.

Model the energy savings for the project using Program-approved software. Ensure the Customer and scope of work proposed meets Program eligibility requirements. Modeled savings must exceed 10%. Reference “Chapter 3 Customer Eligibility” for more detail.

Customer Data Sharing

PG&E customers are required to share meter data with Build It Green as part of their participation in the program. Data sharing allows us to track realized savings post-install and is used to evaluate program improvements, measure value, and long-term results of the Program. The customer-facing Data Sharing instructions are found at www.homeupgrade.org in the [Document Library \(Marketing Tab\)](#).

Create and Submit Pre-Installation Rebate Application

Create and submit pre-installation rebate application through the online [Rebate Application Portal](#). **The rebate application will reserve rebate funds for the project. Reserved rebate funds are not guaranteed; project must meet all program eligibility requirements at completion to receive a rebate.**

For more information, please consult the *Advanced Home Upgrade Job Submission Instructions* at www.homeupgrade.org in the [Document Library](#).

Complete and submit the following required documents:

- Test-In Assessment Form for each unit in the subject building. Test-in results must be submitted within 120 days from test-in assessment. If you have not submitted your test-in results within 120 days, you will have to perform the test-in again in order to submit your results.
- Rater Job Submission Form (if applicable)
- Rater-Contractor Collaboration form (if applicable)
- Customer Incentive Payment Assignment (CIPA) Form (if applicable)
- Job information, including energy modeling HPXML files
- Scope of work or contract signed by the customer. Scope of work or contract must include the total project cost of all the energy efficiency measures installed, and only the energy efficiency measures installed.
- Account holder/property owner information
- Electric and Gas Service Account IDs
- Utility bill release form (if performing energy-model calibration)

Please contact Build It Green (510-590-3360 x606 or info@homeupgrade.org) if you have questions regarding any of these requirements, prior to submitting a rebate application.

Pre-Installation Application Review

Build It Green reviews the rebate application information and documentation to confirm project and Customer eligibility, specifically:

- Customer has active Electric and Gas Service Account IDs
- Contact information is complete for the Customer and PG&E account holder (if different individuals)
- Customer/Property has not received rebates or incentives for any measure in the proposed scope of work within the last six (6) years
- Scope of work meets Program requirements and addresses any deficiencies identified in the CAS test-in results. Scope of work must match energy model inputs.
- CAS testing was performed by a qualified BPI-certified professional or employee of a BPI GoldStar company. Front and back of BPI card must be on file for individual or company performing testing

Rebate Application Return

Build It Green may request additional information needed to complete the pre-installation review. Returned applications will be communicated to you by email. Scenarios that could trigger a rebate application return for revision include:

- The data values are out of range of expected values, based on the home's vintage and scope of work
- Proposed scope of work is inconsistent with modeling assumptions
- Repairs required to address CAS test failures are not included in scope of work
- Missing data or information

Inquiries about returned applications should be directed to your Quality Assurance reviewer (in notes from your pre-installation review) or your Contractor Support Manager (contractorengagement@builditgreen.org) for additional guidance.

Application anomalies may trigger field verification to confirm the contents of submittals. For more information on Quality Assurance and Quality Control refer to Chapter 7 of this document.

Pre-Installation Approval

Once the pre-installation application is approved, a reservation is formed and Build it Green will send you a Pre-Installation Approval email.

The pre-installation approval reserves rebate funds for the proposed scope of work for one year from the date of pre-install approval, after one year the reservation expires and must be resubmitted. **Rebate availability is subject to change without notice. If the Participant chooses to perform work without Pre-Installation Approval, the Participant shall accept full liability for Customer expectations of eligibility and responsibility for rebates. It is the Participant's responsibility to manage Customer expectations of rebate amount. Changes to scope of work from proposal to installation may change rebate amounts and eligibility.**

Execute Scope of Work

Develop a final scope of work that meets Program requirements and technical specifications of upgrade measures selected for customer signature. All combustion appliance safety issues must be included in the signed contract to qualify for a rebate. Execute scope of work as defined.

The date that a Customer signs the final scope of work contract shall constitute the Project Start Date for the Program. The date that work begins on a specific project site shall constitute the Work Start date. The date that all Advanced Home Upgrade work is completed per the customer-signed work-scope on a specific project site shall constitute the Work Finish date.

Test Out Assessment

When any measures or repairs are performed during the project, a CAS test must be performed prior to leaving the job site for the day, and any failures must be repaired. At the conclusion of the project, a final CAS test-out must be performed and accompanied with a signed and dated SQA form matching the test-out date. This is to ensure that no health or safety issues were introduced during the course of improving the home. For 2-4 unit buildings, ensure CAS testing is completed for all units.

The Customer may not waive CAS testing and/or repair of any combustion safety deficiencies identified during the course of upgrading the home. Identify any deficiencies at the Test-In stage and incorporate any required repairs into your scope of work and installation.

A Safety and Quality Acknowledgement Form (SQA Form) is required to confirm that a CAS test was completed at 'Test-Out', after all installation and/or repair work is completed. At the completion of the project and the final CAS Test-Out, the Customer shall sign and date the SQA Form. Educate the Customer about the CAS test and explain your Test-Out results. If the Customer reports that no test was done, Build It Green will visit the home to test for combustion safety and will invoice you for the visit.

Contractors or Raters that fail to complete CAS Tests and/or the SQA Form as specified pose a risk to Customer safety and face immediate dismissal from the program.

Explain to your client that Build It Green or PG&E *may* request access to perform field verification on the project after it is completed. For more information refer to "Chapter 7 - Quality Assurance and Quality".

Submit Post-Installation Rebate Application

Submit post-installation performance data in your energy model and submit all required project documents to the online rebate application portal. Post-installation documentation typically includes:

- HPXML files with modeled site energy savings
- Customer signed and dated Scope of Work. Scope of work or contract must include the total project cost of all the energy efficiency measures installed, and only the energy efficiency measures installed (non-energy efficiency upgrade work performed on a given project is outside of the scope of this Program).
- Test-out Assessment Form. Test-Out results must be submitted within 60 days from project completion (Work Finish) date.
- Customer signed and dated Safety and Quality Acknowledgement (SQA) form
- Rater Job Submission Form (if applicable)
- Rater-Contractor Collaboration form (if applicable)
- Customer Incentive Payment Assignment (CIPA) Form (if applicable)
- Copy of closed permit for applicable central Air Conditioner or central Heat Pump installation (if applicable) to comply with CA SB-1414 (Wolk, 2016)
- Reference information for any applicable building permit and/or supplemental documents (e.g., ARI certificate, photos, equipment specs, etc. -- if applicable)

All rebate applications must be submitted to the online Portal within 60 calendar days from the date that all energy upgrade installation work (per the signed contract scope of work) was completed. Please note that 'Test-Out' may occur on the same day, immediately following this 'work completion' event, or it may occur at some other time after work was completed that is convenient for Customer, contractor and/or BPI assessor, as long as it occurs and is submitted online less than 60 calendar days after the 'Work Finish' date. Rebate applications that pass this date may face cancellation unless extenuating circumstances have been communicated to Build It Green and approved by PG&E prior to exceeding this 60 calendar day time-line.

Please contact Build It Green (510-590-3360 x606 or info@homeupgrade.org) if you have questions regarding any of these requirements or view [Application Checklists](#) on the [Document Library](#), prior to submitting a post-installation rebate application.

Post-Installation Review

Post-installation review evaluates the quality and consistency of the data submitted. The scope of work will be compared to the modeling results to confirm alignment. The CAS results will be reviewed and

compared to the scope of work and modeling to ensure all required CAS and diagnostic testing was performed and that any indicated remediation is/was included in the scope of work.

Build It Green reviews the job information to confirm project and customer eligibility, specifically:

- Customer signed and dated Scope of work is consistent with Program requirements and includes total job costs
- CAS test-out results pass
- CAS test was performed by a qualified BPI-certified professional or employee of a BPI GoldStar company. Front and back of BPI card must be on file for individual or company performing testing.
- A complete, signed and dated copy of the Safety and Quality Acknowledgement form
- Contact information is complete for the Customer and/or PG&E Account Holder. If Customer and PG&E Account Holder are separate parties, a CIPA form is completed and signed.
- Customer has active Electric and Gas Service Account IDs
- Customer has not received rebates and incentives for any measure in the client-signed contract/scope of work within the last six (6) years
- Energy model inputs must match the scope of work and outputs must show minimum 10% expected energy savings.

Build It Green may request additional information needed to complete the post-installation review. Returned applications will be communicated to you by email. Some scenarios that would trigger the post-installation rebate application being returned for revision include:

- Contractual scope of work is inconsistent with modeling assumptions/inputs
- Energy modeling results do not show a minimum of 10% energy savings
- Measures selected are inconsistent with Test Measurements (CAS) form information
- CAS test results show failures

Inquiries about returned applications should be directed to your Quality Assurance reviewer (in notes from your post-installation review) or your Contractor Support Manager (contractorengagement@builditgreen.org) for additional guidance.

Application anomalies may trigger field verification to confirm accuracy of submittals. For more information on Quality Assurance and Quality Control refer to Chapter 7 of this document.

Rebate Approval and Payment

Once the post-installation review is complete, Build It Green will submit the rebate application to PG&E for payment. PG&E will calculate the rebate amount based on the modeled energy savings. Built It Green will notify the Participant via email of the PG&E approved rebate amount. Rebate checks are processed in six to eight (6-8) weeks. Please manage customer expectations accordingly.

Account Holders and/or Customers must be informed of the 'Post-Installation Application Approved' rebate amount by the participating contractor, regardless of who is receiving the rebate.

Customer Survey

Build it Green will email Customers a web-based Customer survey to measure Customer Satisfaction with the Program and overall experience. Please supply Customer email contact information with rebate application submission to assist in survey completion.

Chapter 7 Quality Assurance and Quality Control

Quality Assurance and Quality Control (QA/QC) ensures Customer health and safety, work quality, building performance, verifiable energy-efficiency installations and correlated savings. Program QA/QC also enables Build It Green to evaluate the effectiveness of Program training and provide feedback to Program participants. Consistent standards will be applied whenever possible. QA/QC includes third-party field verifications of randomly sampled projects, Customer surveys, and Program participant feedback, as well as corrective measures (as needed). Every Program participant is required to comply with all components of Quality Assurance and Quality Control.

The QA/QC requirements comply and/or align with similar protocols from existing building performance Programs and standards including Building Performance Institute (BPI), California Home Energy Rating System (HERS I and II), and Home Performance with Energy Star (HPwES). Quality Assurance review will be performed on all applications at the Pre-Install and Post-Install review as described in “Chapter 6 Job Completion and Application Submission”.

Quality Control will select a sample of projects for field inspection. Projects will be inspected by Build It Green, PG&E’s Central Inspection Program (CIP), the California Public Utilities Commission (CPUC), and/or a Program evaluator. Health or safety issues identified during inspections must be corrected before a rebate can be issued to the Customer.

Program participants will have the option to receive up to five (5) free field-mentoring sessions. For questions regarding QA/QC, contact your Contractor Support Manager (contractorengagement@builditgreen.org). Customers scheduled for a Quality Control inspection can contact a Program representative via phone at 510-590-3360 x607 or via email at fieldqc@homeupgrade.org for questions or to reschedule an appointment.

Field Quality Control Inspections

Field Quality Control inspections (FQCs) inspections evaluate the quality of the work performed including diagnostic testing, Combustion Appliance Safety testing, measures installed match energy-model or measures in rebate application, and measure is installed according to technical specifications.

PG&E and Build it Green reserve the right to conduct FQC visits at any time to ensure Customer health and safety. FQCs may be triggered by the following:

1. Random sampling (as described below)
2. Review of rebate application identifies anomalies, including unusual claims or specifications
3. Customer survey or Customer complaint identifies a job performance issue that warrants further investigation

4. Combustion Appliance Safety testing was not performed or Safety and Quality Acknowledgement form was not signed by the Customer.
5. Participating Contractor has outstanding corrective actions, a record of failures from previous jobs or the contractor is under disciplinary action.

Sampling Protocol

FQC inspections are performed to obtain a representative sample of work quality. Raters and contractors working on the same project will both be evaluated during FQC. Each new Program participant will have their first three jobs inspected (Tier 0). Subsequently, their projects will receive field verification inspections according to the rates described in Table 6 below. Participants who consistently fail inspections at any Tier will be dismissed from the program.

Table 6. Field Quality Control Inspection Tiers

Tier	Inspection Rate	
0	100%	Inspection of the first 3 jobs completed. Participant must achieve passing scores (e.g., P1, P0, D1, D0 – see description in Table 9 below) on each of the 3 jobs inspected or 100% pass rate.
1	60%	After Tier 0 is passed, inspection of three of the next five jobs (3 of 5) is completed. Participant must achieve an 80% pass rate to move to the next tier.
2	20%	After Tier 1 is passed, inspection of four of the next 20 jobs (4 of 20) is completed. Participant must achieve an 80% pass rate to move to the next tier.
3	15%	After Tier 2 is passed, verification up to 15% for companies without BPI certified employee on staff. Participant must continue to achieve an 80% pass rate to maintain their tier status.
	5%	After Tier 2 is passed, verification up to 5% rate for Program participants with BPI certified employee on staff. Participant must continue to achieve an 80% pass rate to maintain their tier status.
	2%	After Tier 2 is passed, verification up to 2% rate for BPI GoldStar companies with PG&E approval. Participant must continue to achieve an 80% pass rate to maintain their tier status.

Please Note: In addition to Home Upgrade Program FQC, five percent (5%) of all projects submitted to the Program are selected randomly for inspection by PG&E’s Central Inspection Program (CIP).

Inspection Process

Before leaving the home, provide the Customer with *The Field Verification Visit: What Homeowners Can Expect* available at www.homeupgrade.org on the [Document Library](#). Inform the Customer that a Program representative may call to arrange an FQC inspection.

FQC inspections or PG&E CIP inspections will be scheduled after a rebate application has been submitted for payment. If selected for inspection, Build It Green or PG&E will contact the customer to schedule the inspection.

The FQC verifier may request additional job information such as proposals, recommendations, photos, permits or Customer agreements from the Participant that completed the project. The purpose is to allow the FQC verifier to gain an entire picture of the project completed, evaluate how the Test-In information was presented to the Customer, and if a comprehensive list of recommendations (based on Test-In assessment results and industry best-practices) was given.

The rebate application will be held until the FQC or CIP inspection is complete. If field inspection identifies the need for corrective action, the rebate payment will be held until corrections are completed and verified by Build it Green or PG&E.

Participants must immediately notify customers of hazards found during FQC or CIP inspections. Corrections must be completed and proof of correction photos emailed to fieldqc@homeupgrade.org within seven (7) calendar days. Failure to complete corrections and submit photos may result in disciplinary action and/or fee-based inspections.

Mentoring FQC

An FQC verifier may witness a Test-Out Assessment in lieu of an FQC inspection to minimize the number of visits to the Customer. The Mentoring FQC is an opportunity to receive 1-on-1 mentoring from Build It Green and improve installation.

Participants can schedule up to five (5) mentoring FQCs per year. Participants will have an opportunity to correct any deficiencies identified before an FQC score is determined. If any issues identified require corrective action, correction(s) must be completed before the application can be processed for payment.

Inspection Site-Visit

The FQC verifier or CIP Inspector will complete an introductory discussion with the Customer then begin the inspection. The FQC verifier or CIP Inspector may ask the Customer for a tour of the home to point out where improvements were made and to visually verify measures installed.

FQC verifiers may take digital photos and notes to capture the quality of the installation. Pictures and notes will be used to provide feedback and document any deficiencies needing correction.

For all Advanced Home Upgrade projects, the FQC verifier will:

1. Conduct visual survey
2. Review measures installed and assess that each is *new* or *existing* in the home.
3. Compare installation of each measure against Program technical specifications
4. Replicate diagnostic tests and validate reported Test-Out results
5. Replicate CAS tests and validate reported Test-Out results. All health and safety issues encountered during the verification will be communicated to the customer and reported to PG&E Gas Safety Representative.
6. Report missed opportunities for energy savings not reflected in the Test-In assessment or recommendations. This information is to be used for qualitative evaluation.
7. Prepare an FQC Report and offer suggestions and feedback for the Program participant
8. Review software model inputs and compare to observed conditions
9. Replicate any additional diagnostic tests

FQC verifiers will instruct the Customer to contact the Participant directly for the verification results. The FQC verifier will not discuss any details of the inspection with the Customer unless a health and safety issue is identified. If replication of the CAS test reveals a problem that requires a call to a PG&E Gas Service Representative (GSR) or other immediate response in accordance with *NGAT Action Guidelines*, the FQC verifier will immediately disclose the health and safety findings that require Customer action or consent.

FQC Inspection Score

Field verification scores are based on a scale of 0 or 1 within Fail, Discrepancy and Pass categories. The field verification scoring methodology is based on BPI Technical Standards, and incorporates PG&E-specific Natural Gas Appliance Testing (NGAT) requirements from Advanced Technical Training. This scoring structure allows Build It Green to identify common issues and target additional mentoring and training opportunities accordingly. Table 7 (below) details the field verification scores.

Table 7. Field Verification Scoring Summary

Score	Finding
Fail 0 (F0)	Contractor has left the home in an unsafe condition that threatens occupants' health and safety and requires immediate corrective action (per BPI and NGAT). Verifier has notified the homeowner of the unsafe conditions and has called PG&E to assess the situation. Follow-up is required for all CAS failures and corrective action is mandatory.
Fail 1 (F1)	CAS test results did not meet Program standards and/or triggered a "stop work" action based on BPI and/or NGAT requirements. Verifier has notified the homeowner of the unsafe conditions and has called PG&E to assess the situation. Follow-up is required for all CAS failures and corrective action is mandatory.
Discrepancy 0 (D0)	The contracted scope of work does not meet home performance standards and/or Program requirements. Corrective action is strongly recommended and may be required. Areas of technical performance need improvement.
Discrepancy 1 (D1)	Significant discrepancies in modeling or testing data submitted in the post installation application.
Pass 0 (P0)	Contractor's performance meets most technical standards and program requirements but some areas of technical performance need improvement.
Pass 1 (P1)	Exceptional work completed.

It is possible to receive more than one Fail and/or Discrepancy score. For example, if the Domestic Hot Water (DHW) heater fails spillage testing and knee-walls are left uninsulated, the project would receive a Fail 1 and a Discrepancy 0. The overall score would be the lowest mark received ('Fail 1'). Projects with Discrepancy scores can 'Pass', but projects with 'Fail' scores will not pass until corrective action has been completed.

For additional detail on Field Verification scoring, please review the Field Scoring Worksheet on the [Document Library](#) or contact Build It Green at fieldqc@HomeUpgrade.org or 510-590-3360 x607.

Corrective and Disciplinary Actions

When enforcing project and rebate application corrections, Build It Green and PG&E will maintain a zero-tolerance policy for fraud. This section lists feedback, intervention and enforcement mechanisms that will be used.

Disciplinary Actions for Failures

If an FQC inspection results in a fail, Build It Green will communicate required corrective actions, deadlines, and documentation protocols required of the Program participant to demonstrate resolution. Field verification failures, customer complaints and rebate application anomalies will trigger corrective action if intervention protocols are unsuccessful in improving a Program participant’s performance. Based on a Program participant’s pattern of failed field verification results, there are two levels of ‘failure’ that can trigger increasingly stringent disciplinary actions. Participants must immediately notify Customers of hazards found during FQC or Central Inspection Program (CIP) inspections.

Program participants must make every reasonable effort to work with Build It Green to mitigate the necessity for disciplinary action and avoid such action being triggered. Please reference the *Quality and Performance Improvement Protocol* on the [Document Library](#) at www.homeupgrade.org or contact Build It Green (510-590-3360 x606 or info@homeupgrade.org) for more information on preventing disciplinary action and maintaining a high level of quality and performance in Program participation. A concise version of Disciplinary Actions and Triggers is provided in Table 8 below.

Table 8. Disciplinary Actions and Triggers

Discipline Level	Triggers	Disciplinary Actions
First Offense and Second Offense	Failure to resolve corrective action in seven (7) calendar days	An immediate suspension until corrective action is completed. All rebate applications will be held until corrective action is completed.
	Review of an application identifies anomalies	If corrective action impacts customer health and safety, FQC sampling rate drops to Tier 1. FQC functions may become fee-based for the first 5 inspections.
	Customer complaint warrants further investigation	
	Customer survey identifies a job performance issue	

Repeat Offense or Escalated Issues	Does not pass FQC Tier 1 or Tier 2	Six (6) month suspension, one (1) year suspension or Termination from the Program based upon the circumstance. All FQC inspections will become fee- based and up to 100% of projects may be inspected (reset to Tier 0). All rebate applications will be held until FQC inspections are complete. After suspension is lifted, Participant must retake all training prerequisites and begin at Tier 1.
	Repeated incidents requiring disciplinary action or FQC failures from previous jobs	
	Fraudulent application documents or data	
	Lack of CAS Testing	
	Delinquency in remitting FQC fees	

FQC field verifications can become fee-based when conducted in response to:

1. Review of a project or rebate application identifies anomalies
2. Customer survey identifies a job performance issue or lack of combustion appliance safety testing
3. Customer complaint warrants further investigation
4. Outstanding disciplinary actions from previous jobs
5. Job sampling rate is Tier 0 or Tier 1 because of disciplinary action in response to prior field verification failure
6. Participant is suspended from the program

Fee-based field verification will be charged at a rate of \$500 per FQC visit plus travel costs. Delinquency in remitting verification fees will be cause for suspension.

Avoiding Conflict of Interest

Build It Green strives to deliver Quality Assurance and Field Quality Control that is objective and fair. FQC provides an opportunity to give feedback on home performance upgrades and enables you to continually improve the quality of your work. FQC verifiers **shall** adhere to the following Code of Ethics:

1. Avoid conflicts of interest or activities that compromise, or appear to compromise, professional independence, objectivity, or integrity of work including, but not limited to:
 - Work on any property in which the FQC verifier or FQC verifier's company has any financial interest in the ownership or transfer of the property, either as a lender or equity investor.
 - Work on any property in which the FQC verifier or FQC verifier's company has any financial or familial ties with the builder, general contractor, rater, subcontractors, architect, or owner.
 - Offer or deliver any compensation, inducement or reward to the owner of the sampled property, the broker, or agent, for the referral of any business to the FQC verifier or FQC verifier's company.
 - Accept compensation, directly or indirectly from product or service supplier for recommending those businesses to Program participants or Customers.
2. Act in good faith toward each Program participant and Customer.
3. Perform services and express opinions based on honest conviction and only within their areas of education, training, or experience.
4. Be objective in reporting and not knowingly understate or overstate the significance of reported findings.
5. Not disclose to third parties other than Build it Green any personal or Confidential Information about the project, client, seller, tenant, or others involved in the project without the approval of the individual(s) affected.
6. Not disclose FQC results to anyone other than Build It Green and the Program participant or the Program participant's agent without the approval of the Program participant unless required to do so based on health and safety issues.
7. Avoid activities that harm the public, discredit themselves, or reduce public confidence in the profession or in the Home Upgrade Program.
8. Maintain professional relationships with Program participants, colleagues and others associated with the Quality Control activities without regard to race, color, national origin, gender, religion, age, sexual orientation, or disability.
9. Abide by the Program rules and guidelines in the use of the Program logo and other Program materials.

10. Respond professionally to Program participant, Customer or Build It Green concerns and complaints about a FQC results.
11. Report substantial and willful violations of this Code to Build It Green.

Chapter 8 Training Resources

BPI Affiliates	
Association for Energy Affordability, Inc. (AEA)	www.aea.us.org
Build It Green	www.builditgreen.org
Building Performance Center, Inc.	www.thebpcinc.com
CalCERTS, Inc.	www.calcerts.com
ConSol	www.consol.ws
Consumnes River College	www.crc.losrios.edu
Efficiency First California	www.encyfirstca.org
Sutech School of Vocational and Technical Training	www.sutechschool.com

HERS Providers	
CalCERTS, Inc.	www.calcerts.com
CHEERS (ConSol Home Energy Efficiency Rating Services)	www.cheers.org

Energy Modeling Software	
OptiMiser, LLC	www.optimiserenergy.com
Snugg Home, LLC (SnuggPro)	www.snuggpro.com

Additional Resources	
Association for Energy Affordability, Inc. (AEA)	www.aea.us.org
Build It Green	www.builditgreen.org
Cal-OSHA	www.dir.ca.gov/dosh/dosh1.html
Energy Star®	www.energystar.gov
National Association of the Remodeling Industry (NARI)	www.nari.org
PG&E Energy Training Center (ETC)	www.pge.com/training
DOE Home Energy Score	https://betterbuildingsolutioncenter.energy.gov/home-energy-score

Chapter 9 Glossary of Terms

Advanced Home Upgrade means the customized Program pathway to home performance that requires 'Test-In' and 'Test-Out' whole-house assessments consistent with Home Energy Rating System guidelines, Building Performance Institute, and the national Home Performance with ENERGY STAR Program. The Advanced Home Upgrade requires substantial Program participant training and qualifications; uses commercially available and properly-approved building simulation software and methodology to model site performance and estimate energy savings for each job; and provides substantial Customer rebates and incentives, along with rigorous quality assurance and quality control for measures installed within the Program pathway eligible project scope of work.

Aged Solar Reflectance (ASR): Refers to the roofing product's three-year solar reflectance rating.

Aged Thermal Emittance (ATE): Refers to the roofing product's three-year thermal emittance rating.

Assessment means visual evaluation, diagnostic and Combustion Appliance Safety 'Test-In' and/or 'Test-Out' events, as well as energy software modeling and document submission; specifically excludes installation or other work performed by Participating Contractors and/or subcontractors.

Association of Bay Area Governments (ABAG): The alliance of local governments comprised by the nine Bay Area counties (Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma) that formed the San Francisco Bay Area Regional Energy Network (BayREN).

Building Performance Institute (BPI): The organization headquartered in Malta, New York that supports the development of a highly professional building performance industry through individual and organization credentialing and a rigorous quality assurance Program.

Build It Green (BIG): The nonprofit organization based in California, whose mission is to promote healthy, energy- and resource-efficient homes in California and which is incorporated under the legal name, 'Build It Green.'

California Whole-House Home Energy Rater (HERS Whole House Rater or 'HERS II' Rater) means a person who has been trained, tested, and certified by a HERS Provider to properly gather information on the energy consuming features of a home, perform diagnostic testing at the home, evaluate the validity of that information, simulate and perform analysis for a California Whole-House Home Energy Rating or a California Home Energy Audit using an Energy Commission-approved HERS rating software program to estimate the energy consumption of a home using the information gathered on site, and complete all of the cost-effectiveness evaluations described in the HERS Technical Manual.

Central Inspection Program (CIP): PG&E's internal group responsible for conducting inspection verification of Energy Efficiency Measures.

Combustion Appliance Safety (CAS): The concept (adopted by BPI, PG&E, and others) that addresses safety policies, standards, protocols and procedures regarding the safe installation, maintenance, and

removal of Combustion Appliances and the detection and repair of gas leaks and Carbon Monoxide spillage.

Confidential Information: Customer energy usage and billing data, together with all data or information that is marked “confidential” or verbally identified as “confidential” or “proprietary” by BIG or PG&E. Confidential Information shall not include information that Program participant can prove: (i) was in the public domain at the time of the disclosure; (ii) is subsequently made available to the general public without restriction and without any breach of the Agreement by said Program participant; or (c) was lawfully received by said Program participant from a third party who was not under any written confidentiality or non-disclosure obligations.

Corrective Action(s): Response action(s) required of Program participant(s) in order to correct performance and/or safety deficiencies, at a given Advanced Home Upgrade project, discovered by Field Quality Control (QC) verifier or CIP verifier/inspector.

CSLB: Contractors State License Board (of California)

Customer: Any current PG&E account holder or any individual that will become a PG&E account holder at any time during the course of Home Upgrade Program rebate-eligible project work, but prior to completion of that work. For simplicity, this document may also refer to landlords as “Customers” when the home is not owner-occupied.

Disciplinary Action(s): Action(s) taken by Build It Green in order to incentivize and/or enforce Program participant compliance with Program rules, requirements terms and/or conditions.

Energy Factor (EF): The measure of a water heater’s efficiency. EF is based on recovery efficiency, standby losses and cycling losses. A higher EF indicates a more efficient water heater.

ENERGY STAR®: A joint Program of the U.S. Environmental Protection Agency and the U.S. Department of Energy helping us all save money and protect the environment through energy efficient products and practices. ENERGY STAR is a registered trademark and use of the ENERGY STAR logo must meet strict guidelines.

Energy Upgrade California® (EUC) refers to a collaborative effort among California counties, cities, non-profit organizations, the state's investor-owned utilities (Pacific Gas and Electric Company, Southern California Edison, Southern California Gas Company, and San Diego Gas & Electric Company), and publicly owned utilities. The goals of this statewide effort are four-fold:

1. Help residential and commercial Customers and the building industry become knowledgeable about the many energy and water efficiency Programs and financing options that will be available during the next several years including the State Energy Programs, utility company Home Upgrade Programs, local rebates and incentives, appliance and renewable energy rebates and incentives, and energy financing Programs.

2. Provide a consistent and clear message regarding how Customers can choose the best energy-efficient measures and the right contractors and/or raters to provide those services.
3. Drive Customers and Program participants to a central resource that provides educational information that links all the state energy efficiency upgrade, and rebate and incentive Programs.
4. Educate the building trades and home improvement industry on jobs, training, and required certifications.

Energy Training Center: PG&E's Energy Training Center located in Stockton, California.

EPA means the U.S. Environmental Protection Agency, an agency of the federal government.

Home Energy Rating System (HERS) Program: California Energy Commission (CEC), as required by Public Resources Code Section 25942, established this statewide home energy rating program for residential dwellings. California HERS regulations also established the requirements for Field Verification and Diagnostic Testing services used to show compliance with the Title 24, Part 6; Building Energy Efficiency Standards, and established the basic framework for HERS Rater training, certification, and quality assurance. A recent update to HERS established a systematic process for the delivery of California Whole-House Home Energy Ratings to provide California homeowners and prospective home buyers with information about the energy efficiency of the homes they live in or are considering for purchase. The Ratings also provide an evaluation of the cost-effectiveness of options that can improve the energy efficiency in these homes.

Home Upgrade Program (formerly the Whole House Rebate Program): The rebate Program whereby Customers receive incentives to conduct residential upgrades under the Advanced Home Upgrade rebate pathway. This is the PG&E Program under the statewide Energy Upgrade California® brand.

Low slope: A low slope roof is a roof surface with a maximum slope of two inches "rise" for 12 inches "run" as defined in American Society for Testing and Materials Standard E 1918-97.

Natural Gas Appliance Testing (NGAT): A protocol for testing natural gas appliances in PG&E service territory. The NGAT Action Guidelines use this protocol for determining when a CAS testing individual can 'Make Safe' any CAS issues or needs to contact PG&E to send a Gas Service Representative (GSR) to further assess specific site issues.

Participating Contractor: A CSLB licensed contractor that has been approved for participation in the Program by successful processing of a PG&E Home Upgrade Program enrollment application.

Performance-based Measure: An energy-efficiency upgrade installation measure that requires diagnostic testing (e.g., blower-door and duct-leakage testing). The results of this diagnostic testing must be input to energy-modeling software and reported during rebate application submission.

Participating Rater: A Building Performance Institute (BPI) certified California Whole-House Home Energy (HERS II) Rater that has been approved for participation in the Program by successful processing of a PG&E Home Upgrade Program enrollment application.

R-Value: Insulation is rated in terms of thermal resistance, called R-value, which indicates the resistance to heat flow. A greater R-value corresponds with a greater insulating effectiveness.

San Francisco Bay Area Regional Energy Network (BayREN): The program administrator, created by the Association of Bay Area Governments (ABAG) to manage funding and implementation of residential energy efficiency programs within the nine Bay Area counties. This is one of the stakeholders under the statewide Energy Upgrade California brand.

Steep Slope: Steep slope roofs, or sloped roofs, are roof surfaces with a slope greater than two inches "rise" for 12 inches "run".

Test-In: Combustion Appliance Safety and/or building diagnostics measurement assessment conducted prior (pre-installation) to commencing prospective rebate project site-work.

Test-Out: Combustion Appliance Safety and/or building diagnostics measurement assessment conducted after completion (post-installation) of all rebate-eligible project site-work, per customer-signed scope of work/contract.

Work: Goods and services supplied by Contractors and/or subcontractors to Customers.