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California Energy-Smart Homes Mixed-Fuel Residential Program Implementation Plan

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1 Program Overview

1.1 Program Budget and Savings

Program and/or Sub-Program Name

California Energy-Smart Homes Mixed-Fuel Residential Program (Energy-Smart Homes)

Program/Sub-Program ID Number

SW_RNC_MIXED

Program/Sub-Program Budget Table

CPUC Cost Categories	2021	2022	2023	2024	2025	2026	2027	Total Budget
Administration	\$45,750	\$278,543	\$143,382	\$128,442	\$159,983	\$96,605	\$5,250	\$857,955
Marketing and Outreach	\$125,000	\$243,952	\$167,989	\$107,442	\$138,983	\$-	\$-	\$783,366
Direct Implementation Incentives and Rebates	\$-	\$682,035	\$1,513,213	\$1,905,018	\$1,610,181	\$1,237,267	\$-	\$6,947,714
Direct Implementation Non-Incentive	\$425,750	\$895,503	\$846,760	\$856,808	\$825,275	\$281,072	\$5,250	\$4,136,418
TOTALS	\$596,500	\$2,100,033	\$2,671,344	\$2,997,709	\$2,734,423	\$1,614,944	\$10,500	\$12,725,453

Figure 1. CPUC Budget Categories

Program/Sub-Program Gross Impacts Table

Metric	2022	2023	2024	2025	2026	Total
MWh	7,928	15,770	15,777,	11,377,293	17	50,869
kW	0	5.74	25.33	29.31	58.86	119
therms	0	3,578	15,858	17,809	34,966	72,211
MMBtu	27,053	54,166	55,419	40,601	3,552	180,793

Figure 2. Annualized First-Year Energy Savings (Gross)

Program/Sub-Program Cost-Effectiveness (TRC)

Calendar Year	Target
2021	0.00
2022	1.27
2023	1.66
2024	1.62
2025	1.50
2026	0.31
2027	0.00

Figure 3. TRC Ratio No Admin Target

Program/Sub-Program Cost-Effectiveness (PAC)

Calendar Year	Target
2021	0.00
2022	1.31
2023	1.75
2024	1.73
2025	1.63
2026	0.40
2027	0.00

Figure 4. PAC Ratio Target

Type of Program/Sub-Program Implementer

This is a residential new construction program, serving new construction projects that are too deep into design to switch to all-electric, as well as alterations in which the participant will be installing electric appliances and equipment to replace fossil fuel burning appliances and equipment.

. TRC is serving as the third-party implementer for this program.

Market Sector

The program serves single family and multifamily low-rise (three or fewer stories). The nonresidential new construction program serves multifamily high-rise new construction.

Program/Sub-Program Type

The California Energy-Smart Homes Mixed-Fuel Residential program is a resource program that supports the long-term success of the residential energy efficiency new construction market.

Market Channel(s)

This is a downstream program offering incentives directly to builders, developers, and home/property owners.

1.2 Implementation Plan Narrative

1.2.1 Program Description

The California Energy-Smart Homes Mixed-Fuel Residential Program focuses on supporting a high-level approach to achieving California's advanced energy efficiency policy goals through 2025. TRC will leverage our experience and success in California's residential new construction (RNC) market, and existing relationships with RNC builders, developers, and trade allies (e.g., energy consultants, contractors) to engage with builders and developers to recruit potential new construction projects that are unable to make the switch to all-electric and alteration projects that are only able to partially convert to all-electric. The program is available to customers in the Pacific Gas and Electric (PG&E), Southern California Edison (SCE), Southern California Gas Company (SoCalGas) and San Diego Gas and Electric (SDG&E) territories.

The mixed-fuel program offering will serve three residential subsectors:

- Single family and duplex
- Multifamily low-rise (three or fewer stories)
- Alterations

The objective of the program is to influence the decision and ease the transition to adopt advanced energy measures and facilitate future opportunities through non-incentivized, pre-requisite measures that position homes to transition to all-electric and install demand response technologies more easily in the future. To accomplish this, the program will educate potential participants and stakeholders on the features of mixed-fuel and electric-ready homes; enroll projects; emphasize the installation of advanced energy efficiency measures; and facilitate future opportunities through non-incentivized, prerequisite measures that position homes to install electric equipment and appliances, as well as high-impact demand response technologies more easily in the future. Additional program objectives include:

- Incorporating grid harmonization and utility communication-enabling measures as prerequisites in RNC design, allowing for more easily achievable demand flexibility and grid integration in the future
- Preparing homes to be more easily, and cost-effectively converted to all-electric
- Overcoming misperceptions about fuel-substitution

1.2.2 Program Delivery and Customer Services

Customer Engagement

Program implementation will follow a classic custom project track of recruitment, application review, plan review (including custom project review), enrollment, construction/installation, verification, incentive delivery, tracking, and reporting. Under the guidance of a case manager, participants will partake in educational webinars, and receive design and technical assistance to further understand how to maximize or increase the value of program participation. The case manager will serve as the projects' point of contact for the duration of the program, facilitating projects through the program process.

Our technical assistance will coordinate with and leverage Energy Code Ace's training and resources and work closely with the California Association of Building Energy Consultants (CABEC), the state's trade organization for Title 24 energy modelers. The California Energy-Smart Homes Mixed-Fuel Residential program will leverage CABEC's code training and education resources and annual conference to engage with key program participants. The program will require that all participating single family, duplex, multifamily low-rise, and additions projects submit Title 24 energy models authored by professionals that hold CABEC's residential Certified Energy Analyst (CEA) designation.

TRC will leverage existing relationships using strategies tailored to each residential subsector based on updated marketing analysis conducted during the launch phase. Figure 5 outlines the program's customer acquisition objectives, activities, and materials across all subsectors.

Customer Engagement Objectives, Activities, and Materials

Objectives		
Enroll participants in program	Equip stakeholders to understand program value and advocate for participation	Ensure projects serving HTR and DAC communities represent 20% of program portfolio dwelling units
Activities		
<ul style="list-style-type: none"> Conduct targeted phone and email outreach Conduct email and social media marketing Promote program through leveraged relationships (e.g., past participants), trusted networks (e.g., influential trade/industry organizations), and industry event attendance 	<ul style="list-style-type: none"> Host trainings and webinars to educate targeted audiences Develop and distribute tailored campaign materials to communicate the Energy-Smart Homes value proposition 	<ul style="list-style-type: none"> Develop research-based targeted messaging and collateral that aligns with decision-maker interest Promote program through leveraged relationships and trusted networks Deliver lunch and learns, webinars, and trainings to communicate program value and foster program advocates
Channels		
Trade/Industry Organizations and Networks		
Single Family/Duplex: CABEC, CA Building Industry Assoc., CA Coalition for Rural Housing, Habitat for Humanity Multifamily Low-Rise: CABEC, CA Apartment Assoc., CA Rental Housing Assoc., Housing CA Alterations: CA Apartment Assoc., CABEC, Southern California Assoc. of Non-Profit Housing, Non-Profit Housing Assoc.		
Target Audiences and Decision Makers		
Single Family/Duplex: builders, homeowners, residents Multifamily Low-Rise: developers/owners, managers, residents Alterations: contractors, design teams, developers, owners, residents		
Materials		
<ul style="list-style-type: none"> Email and phone scripts Program website 	<ul style="list-style-type: none"> Case studies E-blasts 	<ul style="list-style-type: none"> Tailored value proposition campaign materials Program factsheets and collateral

Figure 5. Customer Recruitment Activities Summary

Project Processing and Data Tracking for Codes and Standards Advancement

To manage program data, TRC will use our Captures system, a comprehensive workflow management and tracking tool. Captures tracks energy savings projects and measure data in detail, while maintaining the flexibility to adapt the tool to specific program needs. We will tailor Captures to precisely reflect the required customer, marketing, measure, incentive, operational process, and reporting requirements.

Captures supports drill-down details, tracking, and reporting, allowing IOUs to review metrics focused on state, service territory, neighborhood, period-of-time, measure detail, inspection detail, and more. Captures will track Key Performance Indicators and program achievements and provides the following features:

- Serves as the primary, day-to-day program management tool for outreach and intake staff, technical staff, operational teams, field teams, subcontractors, program managers, and PG&E program manager
- Transfers real-time data to any IOU-specified system via an easily designed and implemented API or FTP process at regular intervals and on an ad-hoc basis
- Stores program energy savings data, incentive dollars, and individual measure details
- Provides ongoing data management, tracking, and reporting of measures; unit completions; realized savings; costs; and other target achievement metrics
- Supports the production of required weekly, monthly, and annual program forecasts and reports
- Provides all data that the IOUs require to support program processes execution and impact evaluations, including tracking system data files
- Provides all data that the IOUs require to support Codes and Standards data. This data capture includes sources and methods that go beyond what previous residential new construction programs have traditionally captured.
- Provides secure host support and web-based access for IOU personnel to access reports and dashboards
- Establishes data security for all IOU customers

1.2.3 Program Design and Best Practices

Reducing Market Barriers

The sections below summarize TRC's approach to reduce market barriers across the different subsectors.

Single Family and Duplex New Construction

The single family and duplex markets present an opportunity to enroll homes on a large scale with production builders. By enrolling one builder, the program can influence many properties simultaneously. TRC will implement a customer acquisition strategy specific to single family and duplex decision-makers. The bullets below summarize our communication goals by target audience:

- **Builders/Developers:** Educate about the program and develop them into program advocates
- **Energy Consultants:** Educate about the program, establish them as program advocates while supporting them to leverage knowledge of and relationship with builder clients, encourage program application and engagement on behalf of builders/developers
- **Design Teams:** Educate and engage architects and engineers about the program to influence them to include Energy-Smart Homes program requirements in their building plans

Multifamily Low-Rise New Construction

The multifamily low-rise subsector will allow the program to influence many housing units simultaneously and will provide a pathway to serve affordable and disadvantaged communities. As such, engaging with multifamily developers is key to enrolling multifamily low-rise properties. The bullets below summarize our communication goals by target audience:

- **Developers/Owners:** Educate about the program and develop them into program advocates
- **Energy Consultants:** Educate about the program, establish them as program advocates while supporting them to leverage knowledge of and relationship with builder clients, encourage program application and engagement on behalf of builders/developers
- **Design Team:** Educate and engage architects and engineers about the program so they include program requirements in building plans

TRC will educate developers and owners about best practices and benefits, including improved resident health and safety. To facilitate and support commitment to above-code building early in the design process, TRC will maintain engagement with developers across portfolios of rolling and upcoming projects to identify above-code building opportunities early, pre-design, and influence their decisions.

The program will not actively recruit high-rise multifamily projects. If a developer approaches the program with a high-rise project, TRC will help the developer to understand the differences between multifamily low-rise and high-rise eligibility across programs and provide a warm handoff to the nonresidential new construction program team. If a project includes both high-rise and low-rise buildings, TRC will work closely with the project and the nonresidential new construction program team to facilitate participation in both programs as appropriate.

Alterations

Energy-Smart Homes will separately address the distinct needs of alterations projects' target audiences and decision makers. Recruitment will primarily target HVAC and plumbing contractors providing equipment replacements and multifamily property managers seeking building improvements. Messaging will focus on the specific benefits of converting to electric end uses such as better indoor air quality, reduced operational expenses, and climate change mitigation support. The bullets below summarize our communication goals by target audience:

- **Alterations Contractors:** Educate about program opportunities and incentives, turning them into program advocates
- **Property Managers/Owners:** Educate about retrofit and savings opportunities
- **Residents:** Educate about savings opportunities through alterations projects

Hard-to-Reach and Disadvantaged Communities

TRC will target to achieve 20% of program dwelling units and savings from hard-to-reach (HTR) and disadvantaged community (DAC) populations. The program interprets HTR/DAC customers as low-income designated properties (see income details below) since new construction programs target builders and developers versus individual customers. TRC will conduct market research using Department of Housing and Community Development (HCD) and California Tax Credit Allocation Committee (TCAC) opportunity maps and the residential population within the census tracts designated as DACs by CalEnviroScreen 4.0, to identify new construction in areas high concentrations of housing-burdened, low-income households. Because multifamily low-rise and manufactured housing properties provide critical housing for low-income residents, we will identify areas with high concentrations of multifamily low-rise, manufactured housing, and low-income households. To identify prospective properties and demographics and inform our outreach plan, we will analyze these areas based on the following criteria:

- **TCAC/HCD Opportunity Mapping:** Used for designating annual 9% low-income housing tax credits (LIHTC) and for identifying areas of concern from a fair housing perspective—such as high-poverty and racially segregated areas.
- **Pollution Burden Indicators:** Regions representing potential exposure to pollutants and adverse environmental conditions caused by multiple sources of pollution. TRC will use CalEnviroScreen 4.0 data to identify zip codes identified with pollution burden and population characteristic scores of >60-70.
- **Income:** Zip codes where a high proportion of residents qualify for California Alternate Rates for Energy or Family Electric Rate Assistance Program rates. TRC will use recently completed research (compiled in coordination with PG&E and Athens Research) to identify zip codes where 50% or more of residents qualify as low-income and will cross-reference these with DAC communities.
- **Language:** Regions where English is the second language (ESL), such as Latinx communities in the Central Valley and San Diego County and Asian communities in the greater Bay Area and Sacramento regions. We will use U.S. Census and other market data to identify additional regions with high populations of ESL residents.
- **Geography:** Communities with low or no prior participation in residential energy programs, particularly rural counties.

TRC will continuously evaluate and adjust program marketing strategies to reach the HTR/ DAC goal.

Best Practices

To influence enrollment, TRC will work with project team members, particularly CEAs supporting the projects, to educate the team about the features of an above-code home and high-impact technology or measure options.

To track program influence, in addition to participant surveys, the program will document the design assistance and educational process, through which TRC will receive participant feedback on the challenges, resolutions, and best practices of above-code designs.

Examples of design assistance include integrated design support feedback through design charrettes, program webinars, and recommendations made during plan review. The program will use these examples to assist future projects and inform new content for education and training resources.

The program includes additional strategies for demonstrating cost-effective energy efficiency demonstrated by the program including:

- **Outreach:** A statewide program awareness campaign will leverage our existing relationships to raise awareness for the program, support enrollment goals, and facilitate messaging that includes market-rate, affordable, and Hard to Reach/Disadvantaged Communities throughout the service territory.
- **Stakeholder Education:** Using digital communications and in-person events, the program will strengthen relationships with industry associations like CABEC, California Building Industry Association, non-profit housing associations, and apartment associations. Delivered through targeted marketing including print, digital communications, and events, the marketing team's messaging strategy will drive participation by promoting the program among these key industry stakeholders.
- **Flexibility:** While the program will work with builders and developers to help them achieve the above-code performance necessary for program participation, the program will not dictate specific measures but will allow each participant to make choices that it identifies as cost-effective and functional for its projects to reach the above-code performance target with the construction quality and amenities of each builder and developer.
- **Program Evolution Review:** Our team will work with PG&E and the IOUs in the final quarter of each calendar year to plan cost-effectiveness and market transformation improvements for the following year. Specifically, For the 2022 Title 24 code update effective January 1, 2023, TRC will initiate program improvements and design updates in mid-2022 to review with PG&E. To facilitate timely customer outreach and education regarding the impending change, TRC will work with PG&E to finalize new program rules no later than November 2022.
- **Aging Report:** As an output from our Captures system, this report enables TRC to develop comprehensive forecasts that show future program energy savings, measure-specific performance, energy savings, program cost-effectiveness projections, and incentive totals by month.
- **Support for Future Code Measures:** As available through available performance modeling software, the program will grant performance credit for measures or performance modeling options anticipated to be included in future code cycles.

1.2.4 Innovation

The mixed-fuel offering incorporates the following innovative program design elements. These elements will help increase the uptake of cost-effective energy efficiency and minimize lost opportunities for promoting other demand side energy reduction efforts. The program facilitates future integration of multiple distributed energy resources, thereby maximizing demand-side and electrification opportunities with each intervention.

- **Pre-Requisite Measures to Enable Future Engagement and Further Savings:** The new construction pathway for single family, duplex, and multifamily low-rise, will require that the builder installs a suite of specific enabling technologies: communicating thermostats, segregated

circuits for energy monitoring readiness, electric vehicle charging infrastructure pre-wiring, battery storage readiness, and pre-wiring and enabling space requirements for all-electric homes. These are prerequisite requirements for participation; the program does not incentivize these measures.

- **Advance Measure Adoption through Performance-Based Incentives:** The program's new construction pathway will leverage approved California Title 24 Part 6 compliance software and home energy rating system (HERS) verification processes to capture efficiency improvements over code-built homes, issuing escalating incentives based on improvement over code as measured by the efficiency delta EDR (energy design rating). Participating builders can increase their incentive using any efficiency measure that yields code performance credit, including HVAC, envelope, hot water, and HERS verification procedures.
- **Financial Assistance for Alterations Project:** As part of the program design, the program introduces financing and funding resources during customer engagement through a partnership with the National Efficiency Improvement Fund (NEIF). NEIF offers energy efficiency financing for residential and commercial projects, including on-bill financing options. NEIF will provide a customized program portal, where participating customers can apply for financing and NEIF's portal will identify the best lender, for every particular project and financial situation.

1.2.5 Metrics

The California Energy-Smart Mixed-Fuel Residential Program tracks progress using the following metrics

- Project energy savings (kWh, kW, therms)
- Program cost-effectiveness
- Actual savings vs. goal
- Budget spent
- Savings to budget alignment
- Customer satisfaction by IOU territory
- Savings forecast accuracy
- Engineering quality
- Measure installation pass rate
- Project data completeness
- Customer and builder diversity

1.2.6 For Programs Claiming to-Code Savings

The California Energy-Smart Home Mixed-Fuel Residential Program does not claim to-code savings.

1.2.7 Pilots

Per the solicitation for this program, the program does not include any pilots.

1.2.8 Audits

The program does not require pre- or post-audits for participation or incentive eligibility.

1.2.9 Workforce Education and Training

To promote the program, TRC will host a series of trainings and webinars to educate targeted audiences. Trainings will focus on program eligibility, the participation process, and the benefits of above-code construction. Where possible, TRC will engage workforce education and training programs to promote the development of a valued, skilled workforce within DACs. Figure 6 illustrates potential trade/industry organizations, networks, and decision-makers that we will target. Section 1.2.11. Disadvantaged Worker Plan has additional detail regarding DAC engagement.

Project Type	Trade/Industry Organizations and Networks	Target Audiences and Decision Makers
Single Family/Duplex	CABEC, California Building Industry Association, California Coalition for Rural Housing, Habitat for Humanity	Energy consultants, builders, design teams
Multifamily Low-rise	CABEC, California Apartment Association, California Rental Housing Association, Housing California, Southern California Association of Non-Profit Housing, Non-Profit Housing Association	Energy consultants, developers, design teams, owners
Alterations	California Apartment Association, CABEC, Southern California Association of Non-Profit Housing, Non-Profit Housing Association	Contractors, design teams, developers, energy consultants, owners, residents

Figure 6. Training Target Audiences

1.2.10 Workforce Standards

The California Energy-Smart Homes Mixed-Fuel Residential Program includes HVAC measures, particularly for large low-rise multifamily buildings installing significant HVAC measures. The program requires HVAC equipment to be installed correctly and appropriately to produce forecasted savings while providing the level of service required. We will implement stringent certification, license, background check, and insurance coverage requirements for contractors that support the program. Specific to HVAC, we will require HVAC installation technicians to have C-20 HVAC contractor licenses from the California Contractor's State Licensing Board. TRC will require contractors to supply documentation that demonstrates and maintains compliance throughout the program term. Case managers will work with program participants to collect proper credentials prior to any work being performed. TRC will maintain these records to demonstrate compliance throughout the life of the program.

1.2.11 Disadvantaged Worker Plan

To facilitate job support for disadvantaged workers, TRC will partner with industry associations to bring the workforce training and skill development necessary to support the program design. Our current partnerships with the Building Industry Association, CABEC, various industry, and multifamily housing associations, and IOU training centers provide us with the proper channels to inform and deliver workforce training in support of this program.

To track disadvantaged worker participation in the program, we will include optional response opportunities for participants to provide disadvantaged worker information. This will include the number of jobs and demographic and geographic worker information, as available. The program's participation terms and conditions outline this part of the project closeout process. Through our training partnerships, as possible, we will track the number of disadvantaged workers trained (status disclosed voluntarily through training attendance tracking), the number of trainings completed, and any applicable credentials or certificates that the program awards to disadvantaged workers.

1.2.12 Additional Information

Per CPUC advice letter approval, the Energy Division directs PG&E to ensure the program includes a requirement that program-funded projects using the core pathway comply with the all-electric enabling space requirements of the upcoming building code. Thus, the program shall require each dwelling unit participating in the program core pathway designate a space at least 2.5 feet by 2.5 feet wide and 7 feet tall to enable the future installation of a heat pump water heater. The program also acknowledges that the CPUC policy regarding incentives for gas appliances in new construction projects may evolve during the implementation of this contract, and that CPUC requires the program's full compliance with any such future policy changes, regardless of the status of this contract.

2 Supporting Documents

2.1 Program Manuals and Program Rules

The following sub-sections provide program detail as part of the program implementation plan. Full program rules will be part of the program policies and procedures manual, which is under development at this time.

2.1.1 Program Requirements

The California Energy-Smart Homes Mixed-Fuel Residential Program offers above-code measures for residential new construction and alterations projects. Eligible building types include new single family, duplex, multifamily low-rise, and alterations to single family, duplex, multifamily low-rise buildings. The program uses custom and deemed savings approaches and platforms to identify savings and incentives.

Section 2.4 Incentive Tables, Workpapers, Software Tools, provides a list of measures for each project type.

2.1.2 Eligibility Requirements

To be eligible for program participation, customers must:

- Construct a new single family, duplex, multifamily (three stories or fewer) building; or complete an alteration project on an existing single family, duplex, or multifamily building. The program considers an alterations project eligible when the project changes design or technology (replacing fossil fuel combustion equipment with heat pumps).
- Receive electric or gas service from PG&E, SCE, SoCal Gas, or SDG&E
- Meet minimum program energy efficiency performance thresholds, certification criteria, or equipment specifications as defined by each project type
- Complete and sign an online program participation agreement, including agreeing to program Terms and Conditions
- Not receive incentives for the same measures or scope of work from other public purpose programs
- Adhere to all applicable federal, state, and local laws and codes

2.1.3 Eligible Product Specifications

New Construction

Single family, duplex, and multifamily low-rise must include the following prerequisites:

- Communicating thermostats
- Segregated circuits (for single family and multifamily dwelling units, when each multifamily unit has an individual panel)

- Electric vehicle charging infrastructure pre-wiring in accordance with CALGreen Building Code EV ready requirements ¹
- Battery storage readiness
- Pre-wiring and enabling space requirements for all-electric homes

Alterations

Alterations to existing single family, duplex, and multifamily low-rise projects require:

- Conversion of at least one gas appliance or piece of equipment to electric, including:
 - Heat pump space heating
 - Heat pump water heating
 - Heat pump clothes dryers
- Changes in design or technology, or a complete replacement of the thermal (space conditioning) components plus at least 75% of the distribution system
- Electric vehicle charging infrastructure pre-wiring
- Battery storage readiness as defined in the proposed 2022 Title-24 language

2.1.4 Quality Assurance and Quality Control

The program's quality assurance and quality control (QA/QC) procedures take a phased approach that includes customer project application and documentation review, PG&E and CPUC custom project review, QC protocols, HERS registry validation, and rater confirmation. TRC will conduct field verification on 15% of all units. A full QA/QC plan will accompany the program's management plan. Sections 2.3 and 2.7.3 below provide an overview of the program participation and QA/QC processes.

2.2 Program Theory and Program Logic Model

The Energy-Smart Homes program aims to increase the adoption of electric and electric-ready construction in the residential sector. Figure 7 illustrates the program's goals, outputs, and outcomes.

¹ <https://codes.iccsafe.org/content/CAGBSC2019/chapter-4-residential-mandatory-measures>

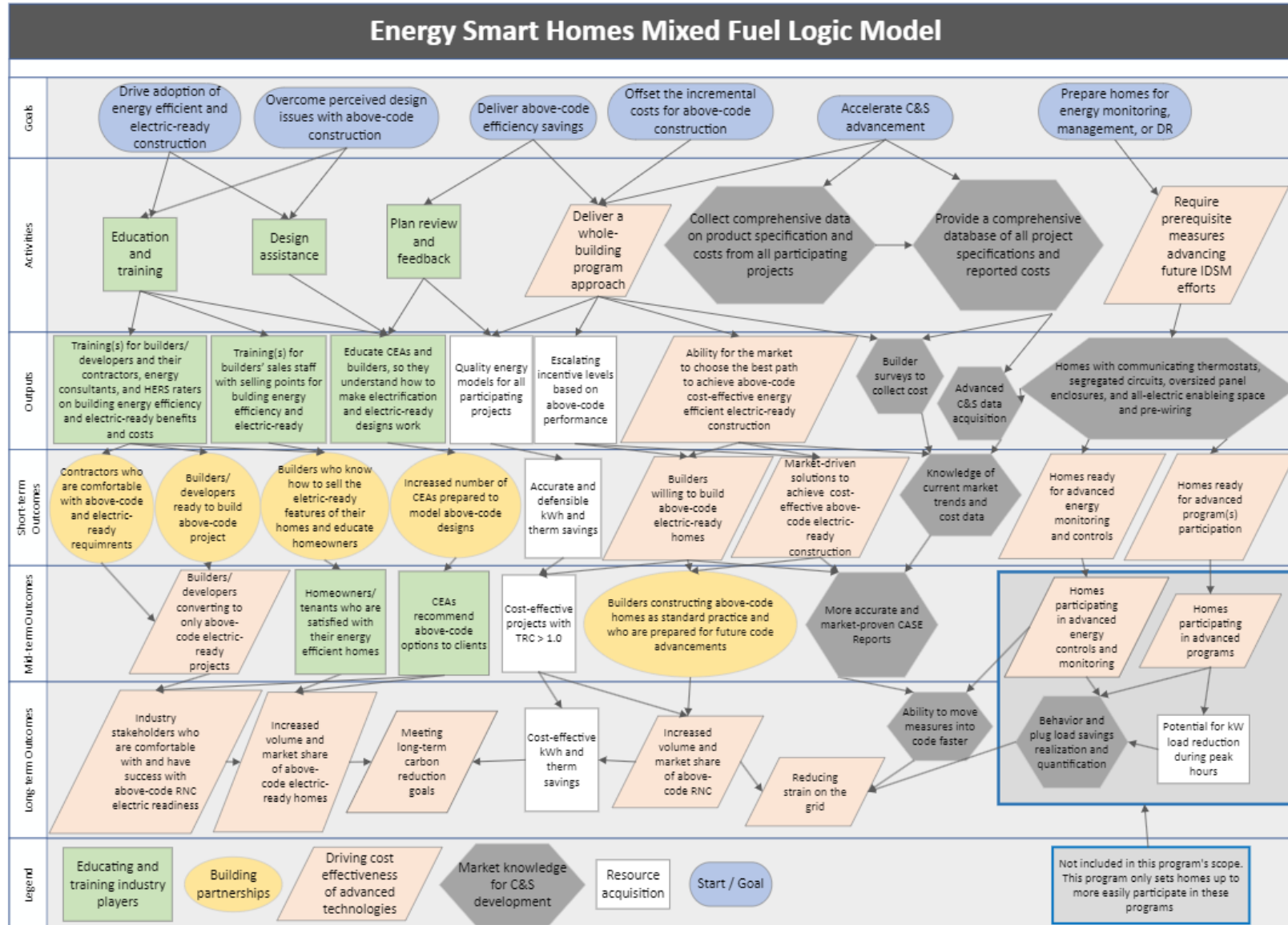


Figure 7. Program Logic Model

2.3 Program Process

Figure 8 illustrates the paths that projects will take through the program.

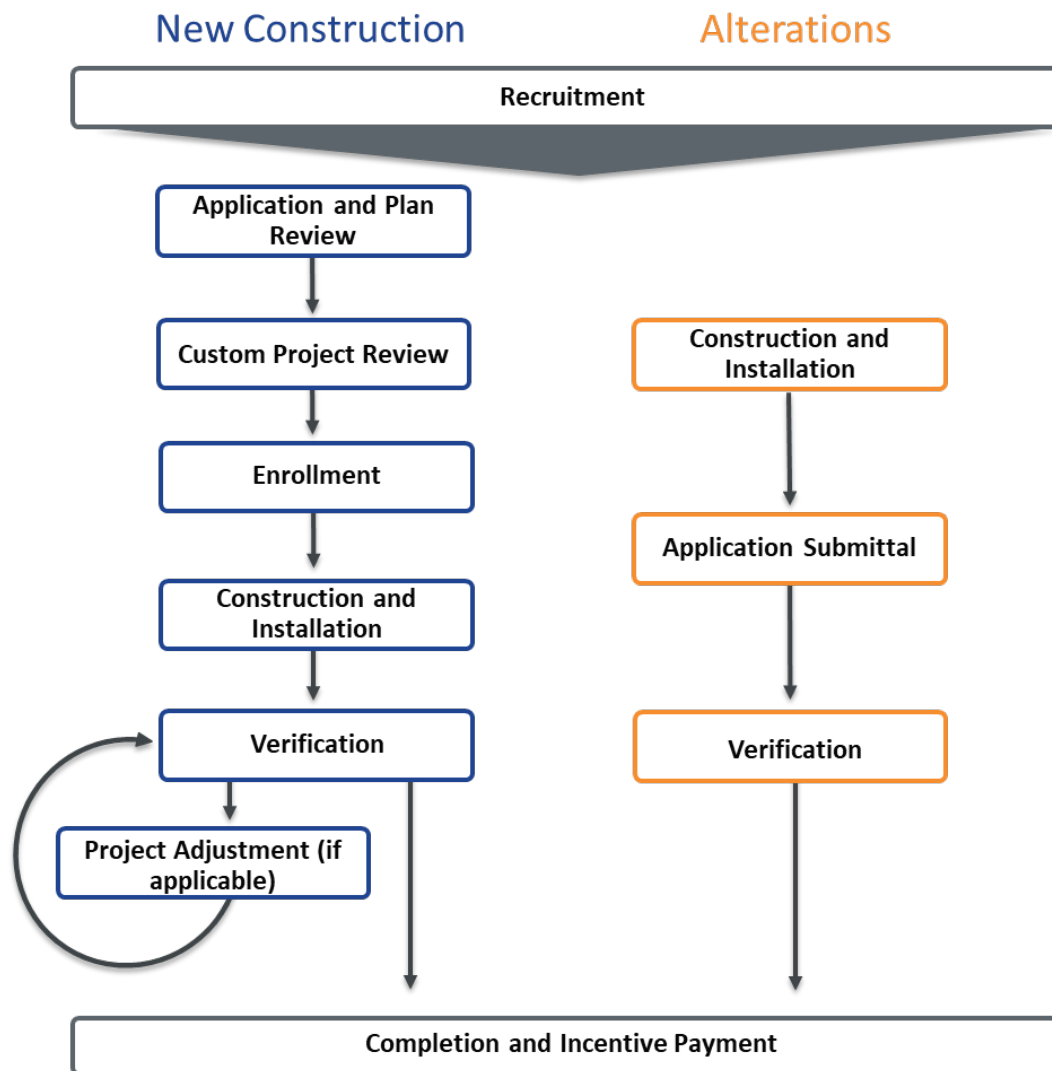


Figure 8. Program Process Flow

New construction projects will go through the following program phases:

- **Recruitment:** TRC will conduct direct outreach to recruit projects
- **Application Review:** TRC will collect and review all project data, as outlined in the program's Quality Assurance and Quality Control Plan, for completeness and accuracy to ascertain program compliance and energy savings.
- **Early Policy Review (optional):** TRC sends memo with project specifics and any policy or eligibility question to PG&E for an early policy review whenever there is a question about policy implications or eligibility for a project. For example, a project that is also participating in another program that might affect the incentive levels, the incremental measure costs, and/or project eligibility.

- **Plan Review:** TRC will examine all documents and files provided for project plan review to verify eligibility and compliance. Per the program's Quality Assurance and Quality Control (QA/QC) Plan, TRC will compare project plans/drawings to the performance building simulation models to help ensure accuracy, and work with project teams to address any issues and secure updated documentation as necessary prior to confirming anticipated enrollment details.
- **Custom Project Review (CPR):** TRC sends a complete project enrollment documentation package, including all relevant project information, and all energy models and compliance documentation for all plan types, as outlined in the program's QA/QC Plan, via secure data transfer to PG&E for custom project review and listing, for possible review, on the CPUC bi-monthly list once approved.
- **Enrollment:** TRC will enroll the project in the program and sends all enrollment documentation to the project team.
- **Construction and Installation:** Participants will construct and install projects over a two- to three-year period and submit incentive request forms (IRF) as homes/buildings complete construction.
- **Verification:** TRC will verify project completion via document submittal and coordination with HERS registries and raters. TRC will review final as-built documents for each home/building on the HERS registry to verify they match the plans approved during the CPR process.
- **Project Adjustment (when necessary):** If during the as-built review process TRC identifies any changes to the design that would affect energy savings or incentives, TRC will send these project adjustments through the CPR process for approval
- **Completion and Incentive Payment:** After confirming all submitted homes/buildings, submitted on the IRF, have completed construction, and have been pre-approved through the CPR process, TRC will invoice PG&E for participant project incentives. Upon payment receipt from PG&E, TRC will issue payment via check to the project payee.

Alterations projects will go through the following program phases:

- **Recruitment:** TRC conducts direct outreach to recruit projects through installer networks
- **Construction and Installation:** Projects install program eligible fuel-switching measures
- **Application Submittal:** Projects submit an incentive application documenting electrification measures
- **Verification:** TRC will review the application and all project documentation, as outlined in the program's Quality Assurance and Quality Control Plan, to verify measure eligibility requirements and installation
- **Completion and Incentive Payment:** After confirming project details, TRC will submit all project documentation, including anticipated grid impacts, along with an invoice to PG&E for participant project incentives; upon payment receipt from PG&E, TRC will issue payment via check to the project payee

2.4 Incentive Tables, Workpapers, Software Tools

The program will serve three residential subsectors:

- New Single family and duplexes
- New Multifamily low-rise (three or fewer stories)
- Alterations in single and low-rise multifamily buildings

New Construction

The program will serve new construction of single family/duplex, and multifamily low-rise buildings. This pathway will leverage approved California Title 24 compliance software. Incentives will be dependent on installed project savings. The program will pay builder/developer incentives on an escalating scale (with a bonus incentive for each additional 0.1 EDR above entry) for above-code construction. Figure 9 outlines the new construction measure codes and incentives by project type.

Project Type	Measure Code	Base Incentive Delta EDR \geq 2.0	Escalating Incentive
Single Family/Duplex	CIB11 ² , CIB14 ³ , CIB15 ⁴ , CIB16 ⁵ , CIB17 ⁶	\$800	\$5
Multifamily Low-Rise	CIB12	\$450	\$6

Figure 9. New Construction Pathway Measures and Incentives

Alterations

The program will provide deemed incentives for alterations to existing single family homes, duplexes, and multifamily low-rise buildings that convert a gas appliances and equipment to advanced electric systems. Incentives will be paid after measures are verified as eligible, installed, and operational.

Figure 10 provides a summary of the deemed measure offerings and associated workpapers.

Measure Code	Description	Workpaper	Incentive
SWAP014A, SWAP014B, SWAP014C, SWAP014D, SWAP014E, SWAP014F	Heat Pump Clothes Dryer Replacing Gas Clothes Dryer	SWAP014-01 (https://www.caetrm.com/measure/SWAP014/01/)	\$500 per heat pump dryer

² INTEGRATED BUILDING-RES-SINGLE FAMILY - WHOLE HOUSE 0%-14.99%

³ INTEGRATED BUILDING-RES-SINGLE FAMILY - WHOLE HOUSE 15-20%

⁴ INTEGRATED BUILDING-RES-SINGLE FAMILY - WHOLE HOUSE 21-30%

⁵ INTEGRATED BUILDING-RES-SINGLE FAMILY - WHOLE HOUSE 31-40%

⁶ INTEGRATED BUILDING-RES-SINGLE FAMILY - WHOLE HOUSE >41%

SWHC044A, SWHC044B, SWHC044C, SWHC044D, SWHC044E, SWHC044F, SWHC044G, SWHC044H	Ductless Mini-Split Heat Pump (SEER 15 to SEER 18, HSPF 8.5 to HSPF 8.8)	SWHC044-01 (https://www.caetrm.com/measure/SWHC044/01/)	\$325 per ton
SWHC045A, SWHC045B, SWHC045C, SWHC045D, SWHC045E, SWHC045F, SWHC045G, SWHC045H	Residential Central Heat Pump (SEER 14 to SEER 18 & HSPF 8.7 to 9.7) Replacing Residential Split Air Conditioner and Furnace (14 SEER and 80% TE)	SWHC045-01 (https://www.caetrm.com/measure/SWHC045/01/)	\$90 per ton
SWWH025A, SSWWH025B, SSWWH025C, SSWWH025D, SSWWH025E, SSWWH025F, SSWWH025G, SSWWH025H, SSWWH025I, SSWWH025J, SSWWH025K, SSWWH025L, SSWWH025M, SSWWH025N, SSWWH025O, SSWWH025P, SSWWH025Q, SSWWH025R, SSWWH025S, SSWWH025T	Heat Pump Water Heater Replacing Storage or Tankless Natural Gas Water Heater	SSWWH025-02 (https://www.caetrm.com/measure/SSWWH025/02/)	\$450 per HPWH

Figure 10. Alterations Incentives

TRC will track these workpapers and verify that the program only issues incentives for qualified measures with approved deemed savings values. New deemed measures may be pursued by the program over the life of the contract as they are added to the eTRM and/or DEER or other approved sources. Workpapers and measures may be added or deleted based on CPUC rulings throughout the lifetime of the program.

2.5 Quantitative Program Targets

Figures 12-15 below summarize program targets by installations and incentives across new construction and alterations projects.

Sectors	2023	2024	2025	2026	Total
Single Family/Duplex	100	450	450	800	1,800
Multifamily Low-Rise	50	200	400	1,050	1,700
TOTAL	150	650	850	1,850	3,500

Figure 11. New Construction Installation Targets by Dwelling Unit

Sectors	2023	2024	2025	2026	Total
Single Family/ Duplex	91,235	\$410,566	\$410,566	\$729,877	\$1,642,223
Multifamily Low-Rise	\$24,161	\$96,646	\$193,291	\$507,390	\$821,488
TOTAL	\$115,396	\$507,202	\$603,847	\$1,237,267	\$2,463,712

Figure 12. New Construction Incentive Targets

Technology	2022	2023	2024	2025	Total
Heat Pump Dryer (units)	1	1	1	1	4
Ductless Heat Pump (tons)	1,856	3,713	3,713	2,819	12,100
Ducted Heat Pump (tons)	337	337	337	95	1,106
Heat Pump Water Heater (units)	105	355	355	180	995

Figure 13. Alteration Installation Targets by Technology

Technology	2022	2023	2024	2025	Total
Heat Pump Dryer	\$500	\$500	\$500	\$500	\$2,000
Ductless Heat Pump	\$603,281	\$1,206,563	\$1,206,563	\$916,094	\$3,932,500
Ducted Heat Pump	\$31,004	\$31,004	\$31,004	\$8,740	\$101,752
Heat Pump Water Heater	\$47,250	\$159,750	\$159,750	\$81,000	\$447,750
TOTAL	\$682,035	\$1,139,817	\$1,397,817	\$1,006,334	\$4,484,002

Figure 14. Alteration Incentive Targets

2.6 Diagram of Program

Figure 15 illustrates the linkages between the California Energy-Smart Homes Mixed-Fuel Residential New Construction Program and our Workforce Education and Training programs, Emerging Technologies, Codes and Standards, and additional integrated efforts across demand-side management, including interacting with other programs as outlined in the program's Policy and Procedure Manual.

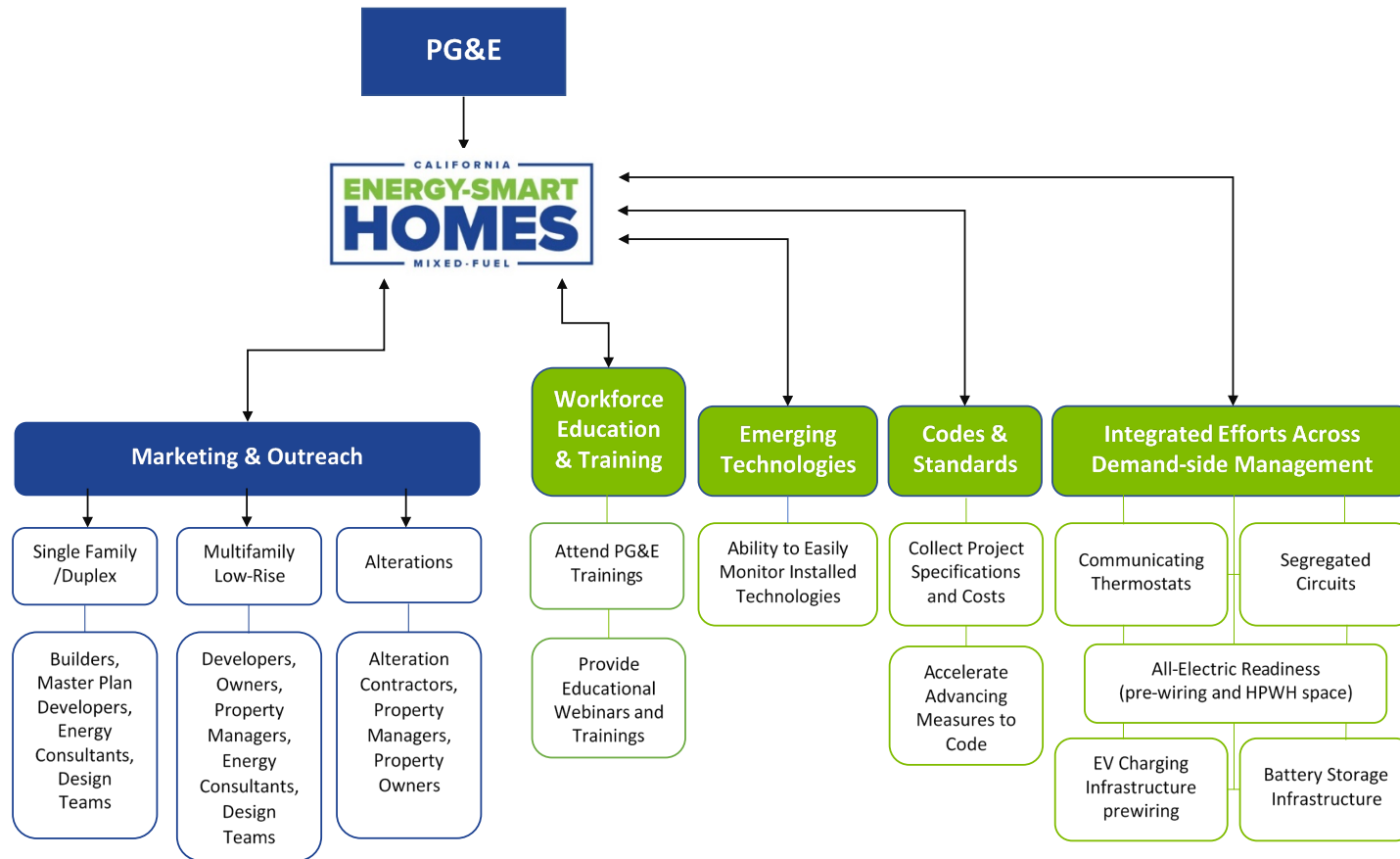


Figure 15. Program Diagram

2.7 Evaluation, Measurement & Verification (EM&V)

EM&V for the California Energy-Smart Mixed-Fuel Residential Program provides ongoing performance feedback during implementation, affirms the program's energy savings and informs planning for future program cycles and code enhancements. As the program has a heavy market support component in addition to resource acquisition, EM&V, which CPUC's evaluation team will conduct, will help confirm the program's success in moving the market towards all-electric technologies by conducting industry standard practice assessments (ISP Studies) on a tri-annual basis timed around the code change cycle. TRC anticipates a need for both impact and process evaluation.

TRC will coordinate with PG&E during the program's launch phase to confirm TRC's intended evaluation planning activities and expected EM&V needs. These include (1) program measure, savings, and cost data, (2) data collection and retention policies, (3) quality control and quality assurance policies, and (4) program influence measurement. TRC will revisit EM&V expectations and needs annually with PG&E to affirm that the program's EM&V strategy can support the need.

TRC designed the program so that all EM&V relevant activities are built into ongoing program operations using program implementation and administration funds. TRC will continuously monitor the quality and integrity of program data, and the efficacy of data collection and retention policies.

The following sections outline key elements of the program's EM&V readiness planning and relevant implementation activities.

2.7.1 Program Data

Measure, cost, and savings data are integral to a successful evaluation. A detailed assessment of the data points TRC will capture is included in the Program Data Plan. Program data will differ across building type and program pathway (i.e., residential new construction versus alterations). TRC will systematically collect and securely retain all program data to help ensure support for process and impact evaluations

2.7.2 Data Collection and Retention Policies

TRC will create systematic, and wherever possible automated, data collection procedures to improve data quality and consistency. Data will come from Title 24 energy models, manufacturer specifications sheets, builder cost surveys, project invoices and certification documents (for alterations and manufactured housing projects, respectively), and HERS Registries. TRC will securely manage program data in our Captures database. Captures data can be searched, filtered, and analyzed to fulfill EM&V data needs. TRC will collect other relevant EM&V information such as field verification reports and builder surveys using SharePoint's secure cloud storage platform. Further, certain data points are collected from the state's approved HERS Registries with original documentation securely stored there in addition to being stored in Captures and SharePoint.

2.7.3 Quality Control and Quality Assurance (QA/QC) Policies

New Construction

For Title 24 regulated projects, the program has a five-component QA/QC strategy with multiple touchpoints to assure the accuracy of the program data from incented projects. Figure 16 outlines this process.

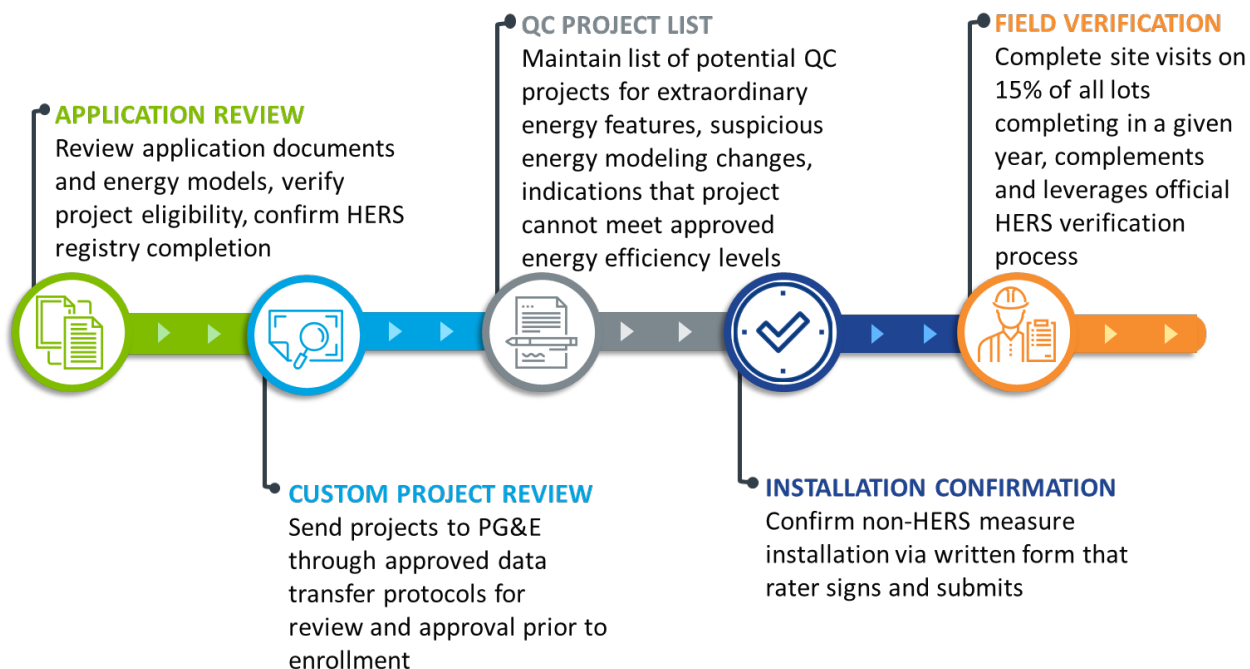


Figure 16. New Construction QA/QC Process

1. **Application Review:** For new construction projects, TRC will review the building's energy model and application details in relation to building plans and measure specification sheets before construction and program enrollment.
2. **Early Policy Review (optional):** Any eligibility and/or policy question is submitted to PG&E for an early policy review whenever there is a question about policy implications or eligibility for a project so that these issues are addressed prior to project enrollment.
3. **Custom Project Review (CPR):** For all projects with custom savings, which includes new construction projects, TRC will submit projects to PG&E for CPR providing a second round of energy model and savings claim verification.
4. **QC Project List:** TRC will maintain a list of projects that will require deeper QC/QC confirmations, either through additional document collection or field verification. This includes projects that used novel or extraordinary energy features, made significant changes to the project details between enrollment and completion, or result in exceptionally high energy savings claims. TRC will collect additional information from the participant and/or conduct field verification accordingly.

5. **Installation Confirmation:** For new construction projects, TRC leverages each project's HERS rater to support field verification of program requirements and measures. Some measures and requirements directly parallel the HERS rater's official role as a specialized inspector that acts on behalf of the building department with jurisdiction. TRC views the officially submitted HERS documentation on the state's HERS Registries, CalCERTS, and CHEERS. The HERS rater affirms accuracy of other measures via signing a statement on a program-created form hosted on the HERS Registry.
6. **Field Verification:** After completion and incentive delivery, TRC conducts field verification on 15% of all new construction homes to confirm the project installed the energy measure mix used to meet program requirements. For any discrepancies, TRC will adjust the savings claim, consider program implementation activities to prevent similar future errors, and consider disciplinary action, including but not limited to removal of any existing projects from the program pipeline and suspension from enrolling any future projects for program participants if warranted.

Alterations

Alterations are not subject to the same CPR process as new construction projects. QA/QC for alterations will leverage some, but not all aspects of the new construction process. TRC will review applications and require documentation affirming eligibility and the installation of approved measures. For alteration projects, TRC will conduct field verifications following a sampling protocol.

2.8 Normalized Metered Energy Consumption (NMEC)

Not applicable for this program.