January 5, 2016

Advice Letter: 3656-G/4752-E

Pacific Gas and Electric Company
Attn: Erik Jacobson, Director, Regulatory Relations
Senior Director, Regulatory Relations
77 Beale Street, Mail Code B10C
P.O. Box 770000
San Francisco, CA 94177

SUBJECT: PG&E Company's Request for Approval of a New Codes and Standards EE Subprogram

Dear Mr. Jacobson:

Advice Letter 3656-G/4752-E is effective as of January 1, 2016.

Sincerely,

Edward Randolph
Director, Energy Division
December 10, 2015

Advice 3656-G/4752-E
(Pacific Gas and Electric Company ID U 39 M)

Public Utilities Commission of the State of California

Subject: Pacific Gas and Electric Company's Request for Approval of a New Codes and Standards Energy Efficiency Subprogram

Purpose

The purpose of this Advice Letter is to seek approval of the California Public Utilities Commission (CPUC or Commission) to establish a new Code Readiness Subprogram within Pacific Gas and Electric Company’s (PG&E’s) Codes and Standards (C&S) Program.

This Advice Letter has two attachments:

Attachment 1 includes a table of proposed subprogram activities to support future Title 24 building codes.

Attachment 2 includes the proposed Code Readiness Subprogram Implementation Plan.

PG&E is required to file an advice letter for approval to establish a new subprogram within its Energy Efficiency Portfolio.¹ This advice filing will not increase any rate or charge, cause the withdrawal of service, or conflict with any other schedule or rule.

Background

The Statewide C&S Program has helped California’s consumers save energy by: 1) influencing state and federal standards and code-setting bodies to strengthen energy efficiency regulations, 2) improving compliance with existing codes and standards, 3) assisting local governments to develop ordinances that exceed statewide minimum

¹ Energy Efficiency Policy Manual, Version 5, dated July 2013, at page 65 states: “For adding new programs, except those chosen during a competitive process, an advice letter must be filed.”
requirements, and 4) coordinating with other programs and entities to support the state’s ambitious energy policy goals.

California’s energy, water, transportation, and climate-related policy goals are included in the legislations, various executive orders, and state agency regulations and reports. While energy efficiency is foundational for achieving many of these goals, it is only one component. California’s statewide goals are diverse in scope, including targets over the next 35 years for energy efficiency, renewable energy, energy storage capacity, zero net energy (ZNE) buildings, demand response, water and greenhouse gas reductions, and zero-emission vehicles.

PG&E supports the vision expressed by Governor Brown and state agencies for California to continue its role as a leader on clean energy policy and climate change issues nationally and globally. The C&S Program has directly or indirectly supported various statewide policy goals and intends to enhance its efforts by developing a new PG&E Code Readiness Subprogram that will enhance portfolio integration and support a broader range of long-term goals.

**Request For Approval**

Achieving California’s policy goals will require greater market transformation by accelerating changes to codes and standards that impact all market sectors throughout the State. To that end, PG&E’s C&S Program has identified a need to improve advocacy by increasing code readiness, including feasibility and implementation of regulations. Both feasibility and implementation may be improved by increasing the quality of data included in public rulemakings conducted by the code setting bodies and by accelerating builder and industry acceptance of new technologies and practices. The C&S team believes these objectives can be realized through targeted data collection, customer inducements, and knowledge transfer. PG&E seeks approval to establish a new subprogram to meet these objectives.

The new subprogram will implement project-level activities to produce information that enhances advocacy and increases the feasibility of more comprehensive climate change mitigation through knowledge transfer to builders and others. In general, code readiness activities will be aimed at future regulations and will supplement existing advocacy efforts, such as research and development of code enhancement proposals, in order to accelerate climate change mitigation activity.

**The Problem the Code Readiness Subprogram Will Address**

The purpose of the subprogram is to support market transformation for measures that are important for achieving program, especially ZNE, goals. Increasing code compliance and supporting market transformation for complex measures are the focus of the code readiness subprogram.
The Code Readiness Subprogram is proposed as a non-resource subprogram that seeks to enhance PG&E’s efforts to achieve state policy goals by implementing project-level activities that enhance C&S advocacy and increase market feasibility of the subprogram measures through targeted data collection, customer inducements, and knowledge transfer to builders and other market actors. As a non-resource program, energy savings will not be claimed for project activities. This approach will maximize program agility and, consequently, responsiveness to CPUC and California Energy Commission (CEC) objectives.

Code Readiness activities will target strategic opportunities that are complementary to other programs in the portfolio. For example, measures for which there is limited time to increase code readiness through voluntary programs, low volume measures that may be important for a specific goal, and activities or measures that have a Total Resource Cost (TRC) benefit/cost ratio much less than 1.0.

Additional Code Readiness example activities include, but are not limited to, the following.

- **Title 24 Code Readiness**: Provide financial inducements to help builders and others incorporate specific measures in building types targeted for ZNE in the 2019 Title 24 code cycle. In return, participants agree to share cost and feasibility data that will be used to inform code development. Financial inducements are a financial payment to customers or contractors in exchange for installing the measure, providing feedback, permission to collect data on site or other requirements. Inducements will be calculated as a function of the cost of the measure and the amount of support required from the customer or contractor.

- **Federal Standards Code Readiness**: Leverage codes and standards research and analysis to improve code readiness for future regulations. Well-sourced technical analysis from recently completed (or almost completed) public rulemakings can be used to develop new incentive program measures that will accelerate the transition to future code efficiency levels.

- **Code Readiness Education and Training**: Leverage the Compliance Improvement Subprogram training infrastructure (e.g., Energy Code Ace) to support knowledge transfer to builders and other for targeted measures. In addition to the value-added training and education benefits, the engagement can help to build stakeholder support for future codes and standards advocacy efforts and compliance.

- Projects that integrate and optimize various systems in support of ZNE policy goals: energy efficiency, renewable energy, energy storage capacity, zero net

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2 See Attachment 1 for details on the potential code readiness activities to support future Title 24 Building Codes.
energy buildings, demand response, water reductions, and zero-emission vehicles and infrastructure.

Market Transformation

This subprogram is intended to influence innovators and early adopters to accelerate changes to regulations early in the product life cycle, and to support implementation of these accelerated codes and standards activities. Measures will be selected based on their potential contributions to the residential or commercial ZNE goals, such as CO2 heat pump water heaters. PG&E will select the measures in collaboration with the CPUC. Each measure will have a plan to increase market adoption, which may include moving them to an incentive program if appropriate. The measure plan may include data collection, creating case studies, customer and contractor education on the benefits and technical aspects of the measures, and providing inducements to compensate participants for participation. The plan efforts will target the specific market barriers for each measure to improve market adoption.

Goals

The Code Readiness subprogram’s goals are:

- **Stronger advocacy efforts**: The data collected as a result of the subprogram will be used in Codes and Standards Enhancement (CASE) Studies to support and strengthen future advocacy efforts.

- **Increased implementation readiness**: The efforts to transform the markets for these measures will increase future code compliance when they have been adopted into a building code or appliance standard.

New and Innovative Activity Mix

The Code Readiness Subprogram will support new code regulations through its innovative mix of data collection, customer inducements, and education. The subprogram will also allow C&S to test, provide support for, and prepare the market for measures prior to moving them into code. In doing so, the subprogram will improve market adoption and support C&S advocacy for important but currently not cost-effective measures.

Budget and Timeframe

PG&E proposes to start the subprogram January 1, 2016, with a first-year budget of $1,358,000, to be funded within the authorized budget for PG&E’s Codes and Standards Program. Table 1 below provides a high level rollout schedule for 2016. See the Implementation Plan in Attachment 2 for additional budget and timeframe detail.
Table 1, 2016 Implementation Milestones

<table>
<thead>
<tr>
<th>Activity</th>
<th>Q1 2016</th>
<th>Q2 2016</th>
<th>Q3 2016</th>
<th>Q4 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activity Prioritization and Selection</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline Study</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Project and contract development</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Project implementation</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Subprogram preliminary assessment</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

**EM&V Plan**

The Code Readiness Subprogram is intended to be a non-resource, market transformation program. See the Implementation Plan in Attachment 2 for EM&V Plan details.

**Program Metrics**

The baseline study conducted at the onset of the program’s implementation will collect the relevant baseline metrics to evaluate the program. The performance metrics for this subprogram will be developed as directed in CPUC Decision 15-10-028 and in conjunction with PG&E’s approved Business Plans.

**Protests**

At the authorization of Energy Division, PG&E is requesting a shortened protest period. Anyone wishing to protest this filing may do so by letter sent via U.S. mail, facsimile or E-mail, no later than December 28, 2015, which is 20 days after the date of this filing. Protests must be submitted to:

CPUC Energy Division  
ED Tariff Unit  
505 Van Ness Avenue, 4th Floor  
San Francisco, California 94102

Facsimile: (415) 703-2200  
E-mail: EDTariffUnit@cpuc.ca.gov

Copies of protests also should be mailed to the attention of the Director, Energy Division, Room 4004, at the address shown above.

The protest shall also be sent to PG&E either via E-mail or U.S. mail (and by facsimile, if possible) at the address shown below on the same date it is mailed or delivered to the Commission:
Any person (including individuals, groups, or organizations) may protest or respond to an advice letter (General Order 96-B, Section 7.4). The protest shall contain the following information: specification of the advice letter protested; grounds for the protest; supporting factual information or legal argument; name, telephone number, postal address, and (where appropriate) e-mail address of the protestant; and statement that the protest was sent to the utility no later than the day on which the protest was submitted to the reviewing Industry Division (General Order 96-B, Section 3.11).

**Effective Date**

PG&E requests that this Tier 2 advice filing become effective January 1, 2016.

**Notice**

In accordance with General Order 96-B, Section IV, a copy of this advice letter is being sent electronically and via U.S. mail to parties shown on the attached list and the parties on the service list for R.13-11-005. Address changes to the General Order 96-B service list should be directed to PG&E at email address PGETariffs@pge.com. For changes to any other service list, please contact the Commission’s Process Office at (415) 703-2021 or at Process_Office@cpuc.ca.gov. Send all electronic approvals to PGETariffs@pge.com. Advice letter filings can also be accessed electronically at: http://www.pge.com/tariffs/.

/S/
Erik Jacobson
Director, Regulatory Relations

Attachment 1: Potential Code Readiness Activities to Support Future Title 24 Building Codes

Attachment 2: Code Readiness Subprogram Implementation Plan

cc: Paula Gruendling, Energy Division
    Service List R.13-11-005
Pacific Gas and Electric Company (ID U39 M)

Company name/CPUC Utility No. *Pacific Gas and Electric Company (ID U39 M)*

<table>
<thead>
<tr>
<th>Utility type:</th>
<th>Contact Person: Kingsley Cheng</th>
</tr>
</thead>
<tbody>
<tr>
<td>☑ ELC ☑ GAS</td>
<td>Phone #: (415) 973-5265</td>
</tr>
<tr>
<td>☐ PLC ☐ HEAT ☐ WATER</td>
<td>E-mail: <a href="mailto:k2e0@pge.com">k2e0@pge.com</a> and <a href="mailto:PGETariffs@pge.com">PGETariffs@pge.com</a></td>
</tr>
</tbody>
</table>

**EXPLANATION OF UTILITY TYPE**

| ELC = Electric | GAS = Gas |
| PLC = Pipeline | HEAT = Heat |
| WATER = Water  |          |

Advice Letter (AL) #: **3656-G/4752-E**

Tier: 2

**Subject of AL:** Pacific Gas and Electric Company’s Request for Approval of a New Codes and Standards Energy Efficiency Subprogram

Keywords (choose from CPUC listing): Energy Efficiency

AL filing type: ☑ One-Time ☐ Other ___________________________

If AL filed in compliance with a Commission order, indicate relevant Decision/Resolution #: N/A

Does AL replace a withdrawn or rejected AL? If so, identify the prior AL: No

Summarize differences between the AL and the prior withdrawn or rejected AL: ____________________

Is AL requesting confidential treatment? If so, what information is the utility seeking confidential treatment for: No

Confidential information will be made available to those who have executed a nondisclosure agreement: N/A

Name(s) and contact information of the person(s) who will provide the nondisclosure agreement and access to the confidential information:
________________________________________________________________________________________
________________________________________________________________________________________

Resolution Required? ☐ Yes ☑ No

Requested effective date: **January 1, 2016**

No. of tariff sheets: N/A

Estimated system annual revenue effect (%): N/A

Estimated system average rate effect (%): N/A

When rates are affected by AL, include attachment in AL showing average rate effects on customer classes (residential, small commercial, large C/I, agricultural, lighting).

Tariff schedules affected: N/A

Service affected and changes proposed: N/A

Pending advice letters that revise the same tariff sheets: N/A

Protests, dispositions, and all other correspondence regarding this AL are due no later than 20 days after the date of this filing, unless otherwise authorized by the Commission, and shall be sent to:

**California Public Utilities Commission**

Energy Division

EDTariffUnit

505 Van Ness Ave., 4th Flr.
San Francisco, CA 94102

E-mail: EDTariffUnit@cpuc.ca.gov

Pacific Gas and Electric Company

Attn: Erik Jacobson

Director, Regulatory Relations
e/o Megan Lawson

77 Beale Street, Mail Code B10C
P.O. Box 770000
San Francisco, CA 94177

E-mail: PGETariffs@pge.com
<table>
<thead>
<tr>
<th>Building Type/Measure</th>
<th>Code Readiness Activity Goal/Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Family Residential</td>
<td></td>
</tr>
<tr>
<td>CO2 HPWH Field Studies</td>
<td>Two demonstration projects to install CO2 HPWH with the goals of collecting information about design and installation, and performance over time.</td>
</tr>
<tr>
<td>Building Pre-Cooling as a Demand Response Strategy</td>
<td>Ten demonstration projects that use building pre-cooling as a demand response strategy with the goals of identifying design considerations, implementation strategies, occupant acceptance, and energy impacts.</td>
</tr>
<tr>
<td>Verified Delivered HVAC System Performance</td>
<td>Evaluate HVAC performance in one-hundred new and existing homes with the goal of verifying modeled v. actual performance to improve modeling assumptions. Inducements provided to allow access to site and data.</td>
</tr>
<tr>
<td>Multi-family Residential</td>
<td></td>
</tr>
<tr>
<td>MF Indoor Air Quality (IAQ):</td>
<td>Engage industry stakeholders to develop infiltration rate determination protocols and perform field diagnosis of infiltration rate affected by construction qualities.</td>
</tr>
<tr>
<td>MF Domestic Hot Water(DHW) System</td>
<td>Demonstration projects to validate high-efficiency MF DHW system designs. High-efficiency DHW system designs will include strategies to reduce distribution loss, utilize high-efficiency water heaters, and optimize integration with drain water heat recovery (DWHR) technologies. The project will include working with the design community to transfer knowledge about effective design solutions.</td>
</tr>
<tr>
<td>K-12 Schools</td>
<td></td>
</tr>
<tr>
<td>TDV Zero Re-locatable</td>
<td>Work with re-locatable manufacturers to develop ZNE designs for re-locatable classrooms and disseminate information on effective design solutions.</td>
</tr>
<tr>
<td>Non-refrigerated Warehouses</td>
<td></td>
</tr>
<tr>
<td>Loading dock door seals</td>
<td>Demonstration project of loading dock door seals in warehouses with the goals of identifying design and installation considerations and verifying performance over time.</td>
</tr>
<tr>
<td>De-stratification Fans/ Natural Ventilation</td>
<td>Demonstrations of de-stratification fans and natural ventilation strategies in warehouses with the goals of identifying design and installation considerations and verifying performance over time.</td>
</tr>
<tr>
<td>Small Offices</td>
<td></td>
</tr>
<tr>
<td>Advanced Plug Load Controls</td>
<td>Demonstration of controlled receptacles in small office buildings to identify design and installation considerations and evaluate savings. The demonstration projects will</td>
</tr>
</tbody>
</table>
include evaluation of:

- Opportunities to for further plug load control requirements for small commercial offices to reduce active and passive energy use when equipment is not in use.
- Space type dependent requirements on number of controlled outlets.
- Effectiveness of various controls, such as occupancy sensor vs time clock / scheduled.
- Opportunities to integrate with alarm code systems for un-occupied shut off when building is alarmed.
- Necessary commissioning for individual time clock or building wide management systems.

The effort will include effort to disseminate results to builders so they can integrate the design solution into newly designed high-efficiency offices.

<table>
<thead>
<tr>
<th>Natural Ventilation &amp; Night Purge</th>
<th>Demonstration projects to investigate impact of natural ventilation and night purge in conjunction with thermal mass in existing buildings. The initiative will evaluate how natural ventilation and night purge in conjunction with thermal mass can reduce energy use in California climates, EnergyPlus testing of how natural ventilation can be simulated in a mixed mode scenario (with active cooling as an option), and how to align with research either being conducted at nationally recognized institutions, such as CBE, or in partnership.</th>
</tr>
</thead>
<tbody>
<tr>
<td>State Buildings</td>
<td>-------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>NR Appliances, Plug Load and MEL Data Collection</td>
<td>Primary data collection (e.g., metering studies; interviews with building managers; on-site surveys to identify the types appliances, plug loads and MELS in use in various building types) to explore appliance, plug load, MEL energy use in NR buildings.</td>
</tr>
<tr>
<td>Drain water Heat Recovery Field Study in State-Owned Buildings</td>
<td>Demonstration projects to evaluate design and installations considerations and energy savings opportunities for DHR systems in NR occupancies in various climate zones in California with focus on state-owned buildings with central water heating and large and continuous hot water demand (dorms, commercial kitchens, laundry facilities). This includes DHR systems in residential occupancies (prisons, mental health facilities, etc.)</td>
</tr>
<tr>
<td>NR HVAC Cross-cutting</td>
<td>-------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Hybrid RTU Evaporative Pre-Cooled condensers / indirect cooling</td>
<td>Demonstration projects to evaluate the effectiveness of requiring hybrid roof top units with evaporative pre-cooled condensers or indirect evaporative equipment in different climate zones. Study to include verification of the forthcoming Energy Plus module for</td>
</tr>
</tbody>
</table>
Hybrid RTUs.

| Radiant Heating and Cooling Thermally Activated Slabs | Field study and research to identify cost effective systems and to collect data on those systems. Study the required design criteria for in-slab radiant heating and cooling systems to achieve a ZNE goal for commercial buildings. Study what criteria must be mandated if designed to holistically reduce energy use, including water temperatures, effectiveness, tube depth, control of DOAS air handler, integration with waterside economizing and other defining performance metrics. Validate field data with the Energy Plus/CBECC-com radiant module and develop proof of concept model. Evaluate the feasibility and cost-effectiveness of these systems and evaluate the type of buildings best suited to this system. |
| NR Lighting Cross-cutting | Demonstration projects to illustrate opportunities for daylight dimming plus OFF in a variety of building occupancies. Energy savings and illuminances in the spaces will be measured over time. Building occupants and operators will be interviewed to collect data on occupant and operator satisfaction. Results will be shared with builders so effective design strategies can be deployed in newly constructed buildings. |
| Daylight Dimming Plus OFF Demonstration Projects and Surveys | Demonstration projects to identify opportunities for lighting controls on poles less than 24 feet tall. Studies of LED outdoor lighting designs and control strategies in parking lots and other hardscaped surfaces will be used to investigate energy savings opportunities and perceived or real impacts on security and amenity. Among other key factors, the field study will evaluate detection distance and whether detection distance should be part of code required equipment specification. Amenity issues include the impact of CRI, CCT and shielding on perceptions of visual trespass, quality of lighting and quality of the lit spaces. |
Attachment 2 – Code Readiness Subprogram 2016 Implementation Plan

Summary:
1. Program and/or Sub-Program Name: PG&E Codes and Standards Code Readiness Subprogram
2. Sub-Program ID number: PGE21056
3. Sub-program Budget Table:

<table>
<thead>
<tr>
<th>Program Name</th>
<th>Administrative Costs</th>
<th>Marketing and Outreach</th>
<th>Direct Implementation</th>
<th>Total 2016 Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code Readiness</td>
<td>$100,000</td>
<td>$0</td>
<td>$1,258,000</td>
<td>$1,358,000</td>
</tr>
</tbody>
</table>

4. Sub-program Gross Impacts Table: N/A
5. Sub-Program Cost Effectiveness (TRC): N/A
6. Sub-Program Cost Effectiveness (PAC): N/A
7. Type of Sub-Program Implementer (Core, third party or Partnership): Core
8. Market Sector (including multi-family, low income, etc): Residential (including single- and multi-family), commercial, and State facilities
9. Sub-program Type (Non-resource, resource acquisition, market transformation): Non-resource, market transformation
10. Intervention Strategies (Upstream, downstream, midstream, direct install, non-resource, finance, etc): Non-resource

Program Description:
PG&E’s Codes and Standards Program (C&S) has identified a need to collect data and support market adoption of measures before including them in code. As a result, the C&S Program has designed a local Code Readiness Subprogram (CRS) with the goal of achieving improved code compliance and advocacy support. The C&S team believes these two objectives can be realized through targeted data collection, customer inducements, and knowledge transfer.

The new subprogram will implement project-level activities to produce information that enhances advocacy and increases the feasibility of more comprehensive climate change mitigation through knowledge transfer to builders and others. In general, code readiness activities will be aimed at future regulations and will supplement existing advocacy efforts, such as research and development of code enhancement proposals, in order to accelerate climate change mitigation activity.

The measures that will be included in CRS will be measures that are not suitable for incentive programs due to cost effectiveness, level of support required, or other issues. Those measures that are unsuitable for incentive programs are key to achieving the C&S program goals. However, they require the effort provided by this subprogram to be included in building codes or appliance standards. The data collected and the increased market adoption will support rulemakings since the market will already be adopting the higher standards. Higher market adoption reduces the opposition to rulemakings.
Each measure included in CRS will have a customized strategy that will determine the current market barriers for the measure, data collection needs, potential markets and targeted education plan. These efforts will be different for each measure and will be updated throughout the process to ensure they continue to address market barriers. This coordinated effort is new for C&S and will support market transformation and improved advocacy efforts. Some of the activities currently exist in the C&S Program, however the integrated plan with the customer inducements and increased data collection will provide greater market transformation and improved savings for the program.

Program Delivery and Customer Services:
CRS is a non-resource subprogram that will perform the following activities:

- Data collection
- Customer and contractor inducements
- Knowledge transfer
- Marketing activities

Data Collection. The program will collect data from customer demonstration sites to understand the energy savings potential, load shapes, installation best practices, key indicators for optimal energy savings, measure targeting information and measure cost data. This information is key for the C&S advocacy efforts and for the market to overcome market barriers.

Customer and Contractor Inducements. The program will provide customers and/or contractors a financial inducement to install the targeted measures. Inducements can include, but are not limited to, financial payments or technical assistance. Since each demonstration site will require extensive data collection, access to the site, occupant interviews and contractor interviews, a financial inducement will be necessary for customers to participate in the effort. It is assumed that the inducements will be offered for a limited number of sites to ensure that data is being collected at a reasonable sample of sites to ensure the data is representative of the targeted customer population.

Knowledge Transfer. Once the data has been collected from a sample of demonstration sites, it will be compiled into a learning module. PG&E will determine the biggest barriers to market adoption for each measure and determine the target audience(s) to overcome these market barriers. PG&E will create learning models for each targeted audience to provide the needed information to the market. These learning modules may include installation best practices, customer targeting, calculating energy savings, or measure payback information. The learning modules may also include calculation tools or other materials to support market adoption.

Program Design and Best Practices:
C&S advocates for higher standards and has been noted by California Energy Commission staff that additional data collection efforts are necessary for the advocacy efforts to support the rulemakings. CRS will produce information that enhances advocacy and increases the feasibility of more comprehensive climate change mitigation by educating builders and the new construction market. Code readiness activities will be aimed at future regulations and will supplement existing research and development of code enhancement proposals.
CRS intends to target innovators and early adopters in order to accelerate changes to regulations early in the product life cycle, and to support implementation of these accelerated codes and standards activities. Measures will be selected based on their potential contributions to the residential or commercial ZNE goals. Participants will be selected based upon the CRS measures. As an example, for a CO2 heat pump hot water heater, the program would select licensed plumbers and HVAC contractors to participate. These contractors would work with their existing customers to find appropriate participants for CRS. The customers and the contractors would receive inducements for their participation to cover the time and cost of installing the measure.

CRS measures will be those that are not suitable for incentive programs due to cost effectiveness, level of support required, or other constraints, as those measures are often key to achieving the C&S program goals. A customized strategy will be developed for each CRS measure, accounting for market barriers, data collection needs, potential markets, and a targeted education plan. These efforts will be different for each measure and will be updated throughout the process to ensure they continue to address market barriers.

While information transfer exists in the C&S Compliance Improvement subprogram, this coordinated effort with customer inducements and increased data collection is new for the Program and will support market transformation, improved advocacy efforts, and increased savings for the program.

**Evaluation, Measurement, & Verification (EM&V):**
The Code Readiness Subprogram is intended to be a non-resource, market transformation program. PG&E will support the CPUC’s evaluation of the C&S Program, including this new subprogram. PG&E considers a dynamic baseline evaluation the best evaluation method for a market transformation subprogram and would welcome working with CPUC’s evaluation team at the beginning of the program to ensure that the necessary data is collected to evaluate the success of the program.

Traditionally, a market transformation program adheres to the following principles:

- A baseline study that provides an initial analysis of the market before the market intervention begins. This includes a market assessment and market size estimate before intervention.
- Integrated market and customer data collection to inform the evaluation.
- Clear program indicators of success with data driven indicators to ensure reliable and credible evaluation findings.

The subprogram will conduct a baseline study to understand the market for the measures selected for the Code Readiness Subprogram as soon as the program receives approval. The program will begin concurrently with the baseline study. PG&E will work collaboratively with the CPUC to define the program data collection plan, market exit metrics, and market exit strategy, to ensure the data collected meets the CPUC’s evaluation needs.

PG&E plans to work with the CPUC to conduct an annual or bi-annual market characterization study to determine the impact of the intervention and success of the program.
Logic Model:

Quantitative Program Targets:
The baseline study conducted at the onset of the program’s implementation will collect the relevant baseline metrics to evaluate the program.

It is expected that the subprogram will complete two measure market transformation plans in 2016, each of which will provide detailed targets. These will be reviewed by the CPUC staff and their consultants. Specific performance metrics for this subprogram will be developed in conjunction with CPUC guidance in D.15-10-028 and PG&E’s approved Business Plans.
Diagram of Program:
Please see the linkages between the subprogram below.
For Market Transformation Programs Only:

In an effort to meet program goals, including zero net energy goals, key measures will be selected to improve efficiency in California. These will be measures necessary to reduce energy such as water heating or heat recovery to dramatically reduce energy consumption. CRS will transform the market for specific measures to facilitate adoption into future codes.

1. **Quantitative Baseline and Market Transformation Information:** A baseline study will be completed by Q2 2016 based upon on the initial measures selected for this subprogram.

2. **Market Transformation Strategy:** Each measure selected to be a part of this program will have a specific market transformation strategy set up to ensure that the market barriers for that specific technology are addressed. Generally, the subprogram will determine any data collection requirements for the specific technology to ensure that the program understands the energy savings potential, load shape, measure cost and installation best practices. The subprogram will work with customers and contractors to get the measure installed and data collected. Once the data has been collected the data and best practices will be compiled. The program will work with potential contractors and customers to educate them on the potential savings, installation best practices. The program will assess additional market barriers after the initial education effort to determine the program next steps. Additional efforts may include marketing campaigns, moving to an incentive program, additional education efforts, and contractor training.
AT&T
Albion Power Company
Alcantar & Kahl LLP
Anderson & Poole
Atlas ReFuel
BART
Barkovich & Yap, Inc.
Bartle Wells Associates
Braun Blaising McLaughlin & Smith, P.C.
Braun Blaising McLaughlin, P.C.
CPUC
California Cotton Ginners & Growers Assn
California Energy Commission
California Public Utilities Commission
California State Association of Counties
Calpine
Casner, Steve
Cenergy Power
Center for Biological Diversity
City of Palo Alto
City of San Jose
Clean Power
Coast Economic Consulting
Commercial Energy
Cool Earth Solar, Inc.
County of Tehama - Department of Public Works
Crossborder Energy
Davis Wright Tremaine LLP
Day Carter Murphy
Defense Energy Support Center
Dept of General Services
Division of Ratepayer Advocates
Don Pickett & Associates, Inc.
Douglass & Liddell
Downey & Brand
Ellison Schneider & Harris LLP
G. A. Krause & Assoc.
GenOn Energy Inc.
GenOn Energy, Inc.
Goodin, MacBride, Squeri, Schlotz & Ritchie
Green Power Institute
Hanna & Morton
International Power Technology
Intestate Gas Services, Inc.
Kelly Group
Ken Bohn Consulting
Leviton Manufacturing Co., Inc.
Linde
Los Angeles County Integrated Waste Management Task Force
Los Angeles Dept of Water & Power
MRW & Associates
Manatt Phelps Phillips
Marin Energy Authority
McKenna Long & Aldridge LLP
McKenzie & Associates
Modesto Irrigation District
Morgan Stanley
NLine Energy, Inc.
NRG Solar
Nexant, Inc.
ORA
Office of Ratepayer Advocates
OnGrid Solar
Pacific Gas and Electric Company
Praxair
Regulatory & Cogeneration Service, Inc.
SCD Energy Solutions
SCE
SDG&E and SoCalGas
SPURR
San Francisco Water Power and Sewer
Seattle City Light
Sempra Energy (Socal Gas)
Sempra Utilities
SoCalGas
Southern California Edison Company
Spark Energy
Sun Light & Power
Sunshine Design
Tecogen, Inc.
Tiger Natural Gas, Inc.
TransCanada
Troutman Sanders LLP
Utility Cost Management
Utility Power Solutions
Utility Specialists
Verizon
Water and Energy Consulting
Wellhead Electric Company
Western Manufactured Housing Communities Association (WMA)
YEP Energy