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**VIA EMAIL (docket@energy.ca.gov)**



California Energy Commission
Dockets Office, MS-4
Re: Docket No. 12-EBP-1
1516 Ninth Street
Sacramento, CA 95814-5512

Re: Comprehensive Energy Efficiency Program for Existing Buildings (AB 758 Program) – Comments of Pacific Gas and Electric Company on October 8-9, 2012 Workshops

## I. INTRODUCTION

Pacific Gas and Electric Company (PG&E) appreciates the opportunity to provide comments on the California Energy Commission's (CEC) Scoping Report on the implementation of a comprehensive energy efficiency program for existing buildings, as required by Assembly Bill (AB) 758 (Skinner, Chapter 470, Statutes 2009). PG&E's comments provide a general framework for implementation, key principles, as well as answers to the questions contained in the workshop agendas.

As discussed at the October 8-9 workshops, "whole building" means different things to different people and it is important to clearly define what is meant by a whole building approach at the outset. Two key dimensions of the "whole building" concept are the scope of the improvements and the method of program evaluation. From PG&E's perspective, a whole building upgrade program is one that affords prospective participants an opportunity to take a comprehensive approach to building efficiency through multiple retrofit or retro-commissioning measures, with savings determined using whole building performance measurements, through either a billing data analysis or calibrated simulation.

While California does not yet have a whole building upgrade program for existing commercial buildings, existing commercial building customers in California can and do pursue comprehensive retrofits through traditional customized retrofit programs. However, this approach has generally only been viable for large buildings. California utilities could play an important role as sponsors of whole building upgrade programs, but a number of policy and evaluation issues must first be addressed before whole building upgrade programs can be deployed at the scale envisioned in AB 758.

To advance the discussion, PG&E has taken a leadership role among California investor-owned utilities (IOUs) in proposing a Whole Building Demonstration during the 2013-2014 Bridge Cycle that would test both the viability of whole building upgrade programs, as well as provide

an opportunity to address these policy and evaluation challenges. The Whole Building Demonstration as proposed would target a select number of commercial buildings of different sizes and end use types and the results of the Demonstration should inform future program development. Ultimately, the whole building focus should provide a more cost-effective alternative to traditional customized retrofit programs for buildings, improve the accessibility of customized programs for small and medium business customers, and potentially capture device savings as well as operational and behavioral savings with persistence demonstrated through performance-based approaches.

From a policy perspective, one of the key challenges in AB 758 implementation will be how to address the "code baseline issue." Current policy allows California IOUs to be rewarded for energy savings only in excess of the levels that would have been achieved under compliance with the latest building codes. This policy creates a potentially severe problem for whole building upgrade programs in that it would require customized, and therefore very expensive, estimation of the code baseline for every treated building. Additional thought on how to incent customers to make the full changes needed to get to or exceed current building codes, as well as what, if any, accounting adjustments are needed once upgrades are complete to ensure savings are not double counted.

PG&E is dedicated to helping California meet its energy efficiency goals in existing building stock and is already utilizing many of the approaches detailed in the Scoping Report (Report) to help make this a reality. However, projected savings scenarios presented in the Report are highly speculative at this time and, as noted in the Report and by stakeholders, achieving significant savings will require an unprecedented level of coordination and effort by all market participants. Areas such as policy and program development, consumer and workforce education and outreach, technology and product research and development, supply chain services and financing must all be aligned in a seamless process to provide end-to-end delivery of a product which consumers find beneficial, easy to understand, and simple to use. Scale must be achieved quickly and innovation must be continuous to support even the most conservative savings scenarios outlined in the Report.

As a threshold matter, whole building upgrade analysis should start with a baseline of actual energy usage, rather than an estimation of usage. PG&E has at least 12 months of data for each building in its territory. This actual usage information should serve as the starting point for application of any energy efficiency treatments. Furthermore, it is important to help customers understand that energy efficiency retrofits are not "one and done" sorts of projects. A change in customer thinking to "continuous commissioning" of retrofit projects is important as well, to keep the existing building stock moving toward meeting, then exceeding, the current building code requirements.

With respect to the quantification of reasonable goals for Investor Owned Utility (IOU) programs that support AB758 and other Strategic Plan initiatives, PG&E looks to the Potential and Goals Studies now underway at the CPUC to address these issues for its 2015 EE portfolio cycle.

Lastly, PG&E strongly supports the development of flexible software tools and models that are customer friendly and allow for measurement of actual customer savings. With the roll-out of SmartMeters, much more customer-specific information is available to allow customers to partner with firms to determine where to best invest in energy efficiency upgrades and to then see the actual savings in their bills. Given technology is changing so quickly, reliance on outdated models that do not provide customers the information needed for decision making could delay customer uptake of the program if actual savings do not materialize.

## II. SIMPLIFIED TOOLS ARE A CRITICAL ELEMENT OF INCREASED CUSTOMER PARTICIPATION

Day 1, Panel 1 panelists focused on lessons learned through the Energy Upgrade California program. PG&E provides a response to each of the questions contained in the agenda for this panel.

**Questions:**

1. What customers are choosing building performance upgrades today? Where are the opportunities for scaling upgrades?

PG&E's customer database shows that customers who are choosing building performance upgrades today tend to have lived in their homes one to five years, have children, have a home built before 1995, and have higher bills. A recent evaluation, measurement, and verification (EM&V) process evaluation showed that approximately one-third of participating customers were recent home builders and, in the region served by the CHF Residential Energy Retrofit program, approximately 50% of the participants used financing for the projects, in large part due to CHF's moderate income requirements and very low rate during the ARRA period. A majority of customers completed more than four energy efficiency measures (the top four measures as of June 2012 were HVAC duct leakage, building leakage, attic insulation, and HVAC duct insulation), and 50% of program participants learned about the program from a contractor. Scaling of the program could be achieved by simplifying program requirements and providing a range of participation paths for customers. Participation paths could include the offering of basic packages with numerous enhancement opportunities. Such packaging would allow contractors to offer set packages, reducing the sales and administrative cycle time, and therefore reducing the overall project cost.

2. What value do building assessments bring to the homeowner and/or contractor? What should be their role in upgrade programs?

Comprehensive home assessments have value to both the homeowner and contractor; however, their value is dependent on where and when they are required relative to program participation. There should be a continued role for assessments in the program, especially to help identify deep savings opportunities, but the timing and extent of the assessment may need to be simplified for the most common measures and building types (i.e., offering enhancements to a basic package).

For example, an investment grade building assessment is likely to only provide value if the assessment enables access to financing and rebates that require a performance analysis (similar to the "Calculated Rebate" approach). However this type of assessment is too expensive to use as a minimum requirement to participate in energy efficiency programs relative to the typical benefits from the assessment. Such assessments should be reserved for particular segments that are likely to act on the information, including, for example, the top quartile of energy users in the state, who are responsible for nearly half of all the electrical consumption.

For other, less energy intensive users, it would be helpful to create a simplified diagnostic tool or "triage test." This simpler assessment would be very streamlined and available at a lower cost to customer, saving them both time to perform the analysis and money. Diagnostic testing is an integral part of home performance and can help offer customized solutions that address not only energy efficiency but also indoor air quality, comfort and building durability. With this test, a determination could then be made as to whether a home is a candidate for more expensive, investment grade services or if sufficient information was available to move forward with a basic package of energy efficiency enhancements. This simple asset rating should be coupled with operational data informed by SmartMeter information to compare or calibrate the report to the customer, allowing more customized solutions and greater insights into actual energy savings once the energy efficiency measures are implemented.

Furthermore, the Department of Energy has already created such a service that could be leveraged for the California market -- the Home Energy Score (HES). [1] The HES is based on a walkthrough process, has only twenty questions, with an expectation of less than an hour of time. Based on California Title 24 regulations that require the use of Time Dependent Valuation of energy usage, a cross walk calculation will be necessary to create a California version (HES/CA). Prescriptive (Deemed) programs should use the HES/CA as a consistent measurement. Performance (Calculated) programs should use the full HERS II and produce a HES rating for future use. The HES rating should be the easy entry point, with a common denominator that sets the "miles per gallon" for each home by rating the structure, not the occupant's operational habits.

Customers may be enticed to take action based on Operational Ratings that can be derived from utility on-line services, third party tools using data released via the Green Button, or other calculation tools. Such assessments are part of the sales process and should be encouraged, as they may encourage customers to take action when they may not have otherwise analyzed their energy usage.

3. What is the role of rebates in efficiency upgrade programs? How can financial products/financing strategies motivate deeper retrofits in lieu of rebates? Are both needed to motivate deeper retrofits?

[1] All references to HES/CA in PG&E's responses rely on the assumption that the California version of HES will either improve HES by considering integration of operational information or will look to other tools that incorporate actual consumption in the process of developing a simple rating.

PG&E's experience is that customers have preferred rebates over financing mechanisms. The analogy would be cash now, as opposed to debt. However, as the state looks to achieve energy efficiency savings with more expensive, deep retrofits, there may be an opportunity to have both tools work in concert. In any event, both tools are needed because they provide greater customer choice (e.g., some customers may prefer incentives, particularly if lower-cost financing options outside of the energy efficiency arena are available to them).

AB 758 financing efforts should be aligned with the statewide financing efforts currently being led by the CPUC for the 13-14 EE program portfolio. The number of financial products that will be coming online over the next few years is likely to grow considerably. It is critical, from a customer protection perspective and to reduce confusion, that efforts be coordinated.

4. How can "reactive" interaction with customers (e.g., HVAC tune-ups or water heater replacements) best be leveraged to encourage whole house upgrades? How can such customer interaction encourage or enable future upgrades?

Unplanned or "reactive" interactions with customers provide an excellent opportunity to encourage customers to start thinking about whole house upgrades. PG&E plans to continue to engage heating, ventilation and air conditioning (HVAC) and plumbing contractors and to educate them on home performance assessment tools. Many of PG&E's top home performance contractors are HVAC contractors who have integrated home performance into their business.

To implement AB 758, PG&E plans to use a variety of tools to engage customers by providing increased messaging on home performance and by providing point-of-sale (POS) and local government permit counter materials to target customer decision points. These materials will need to be easy and simple to allow contractors who are making replacements to better integrate home performance discussions into their conversations with customers.

HVAC programs also should be leveraged to achieve deeper energy savings for customers who install new equipment. However, rapidly ramping up recruitment of HVAC contractors or prioritizing incentives to HVAC contractors to upsell customers during replace-or-burnout customer emergencies may be off-putting to customers who are simply focused on repairing equipment. Development of an "evergreen" customer-contractor relationship foundation across a broader base of existing HVAC users would be a superior way to foster vendor-customer discussions of planned replacement of HVAC installations and related full whole-house upgrades. PG&E's Statewide HVAC Quality Maintenance program is designed to foster this type of relationship, since it encourages customers to sign up for a comprehensive, trust-building, long-term service agreement aligned with the national standard from the Air Conditioning Contractors of America (ACCA Standard 4).

5. What milestones and metrics are most appropriate for measuring success of programs to motivate upgrade activity? Against what criteria or guiding principles should potential AB 758 program initiatives be assessed and prioritized?

The milestones and metrics that are most appropriate for measuring the success of programs will vary over the AB 758 implementation lifecycle. For example, in the early stages of implementation of measures that motivate extensive comprehensive, whole building energy upgrades, metrics that inform program and regulatory improvements are of the most value. These "lessons learned" and evaluations of what worked and what can be improved from early upgrades can help ensure that larger program rollouts will be successful. It is more important to do fewer jobs very well and learn from them, than to touch as many homes as possible in as short a time as possible. Accordingly, the "number of buildings/homes treated" is not the most important metric in the early stages of program implementation and should only be used in concert with quality-based metrics over time.

Program initiatives should be measured against customer satisfaction, quality assurance, and safety metrics. Word of mouth is one of the best ways to spread news about this type of upgrade activity, and therefore it is important that the criteria reflect positive customer experiences and improved safety and comfort of the homes addressed. Early steps should ensure the proper foundation is laid for long-term market transformation, with a focus on activities that will help the market function properly, as opposed to needing rebates and continuous incentives to encourage customers to invest in energy efficiency upgrades. If intervention activities are non-market-oriented and do not provide a means to leave the market working better than before, then the intervention activities should be called into question. A successful program is not one where a new, separate non-real-world market for "rebate-chasers" is created.

6. How can quality assurance be provided without excessive impact on the customer experience?

The CEC and CPUC should collaborate with the utilities to synchronize voluntary utility programs with State codes and standards. Quality assurance should be addressed in a tiered manner, with less experienced contractors being subjected to more quality assurance inspections until they have demonstrated a sufficient track record of quality installations and performance.

It is important to position quality assurance from the perspective of customer benefit and satisfaction, given that it ensures the project has been completed correctly, and that the customer is safe.

7. How can Marketing, Education & Outreach efforts leverage and coordinate with other efficiency programs, implementers and regions?

Marketing, Education and Outreach efforts can most effectively leverage and coordinate with other efficiency programs implementers and regions by aligning program goals and communications with customer needs and expectations. PG&E uses customer segmentation, data analysis, and tracking and lessons learned from previous outreach efforts to help refine our understanding of customers' needs, by customer segment, and then target offerings appropriately. Initial engagement with customers often leads to further engagement and often provides opportunities for marketing of complementary Demand Side Management (DSM) programs and services, including energy efficiency, demand response, solar, audits, etc. PG&E

and the IOUs are uniquely positioned to coordinate these local outreach efforts as a result of these customer insights, combined with the benefits associated with PG&E's entire portfolio that includes: energy efficiency, demand response, solar, rates and other DSM program offerings.

A coordinated approach can be used to expand program and messaging reach and should leverage existing infrastructure and relationships with outside parties such as local government partners, implementers, contractors and Regional Energy Networks (RENs). When multiple stakeholders or implementers are involved, it is especially important to foster consistency of experience and messaging through clear guidelines and monitoring for compliance. Clear guidance and oversight helps ensure that customer communications are streamlined, efficient and do not confuse customers with seemingly duplicative or even contradictory offers.

PG&E agrees with the recent Scoping Memo that indicated, "Energy upgrade programs should be developed in coordination with market infrastructure, such as a coordinated marketing messaging and outreach efforts."[2] Statewide Marketing Education and Outreach is one example of a utility program that is being designed so that Marketing, Education and Outreach efforts can leverage and coordinate with other efficiency programs, implementers and regions program to build awareness and interest that drives further engagement. Another example is PG&E's holistic approach to customer experience and related channel strategy. Channels such as retail, events and mobile tours and outreach coordinated with vetted community-based organizations, offer many points of engagement that provide a natural environment to introduce energy management concepts that cover virtually all aspects of DSM. PG&E supports the offering of all DSM resources (solar and distributed generation, demand response, energy efficiency, Energy Savings Assistance Program, and others) through various channels (contractors, account reps, marketing campaigns, RENs, implementers) to customers.

8. What workforce development is desirable for the residential sector?

For the residential sector, workforce development that is better integrated and coordinated with the sector strategy is needed to balance supply (trained workforce) and demand (jobs). Earlier national, state and local initiatives spent a large amount of dollars training a green workforce, but the number of jobs available did not correspond with supply. To avoid this result, a needs assessment approach must be utilized to ensure there is the right balance of skills and abilities in the market compared to what is actually needed, and that dollars are utilized in an effective manner. Furthermore, hands-on training efforts and refresher classes for individuals with previous training should be the main priorities for any new workshop development programs. Installer needs should also be considered in the sector strategy process in concert with new developments at BPI and other industry organizations focused on building performance (e.g., ACCA) for industry certification of additional market actors.

There must also be consistency in the delivery of training on rating system implementation. As a result, industry certification for trainers is needed, along with training program certification.

[2] Scoping memo, Page 115

## III. THE COMPLEXITY OF THE REQUIRED RATING SHOULD BE BASED ON WHO WILL USE THE RATING

Not all customers require the same type of rating. There are many opportunities to streamline and reduce the cost of a rating, as described below. Incurring great expense to do an investment grade rating for all buildings is likely not the best use of monies when a simpler, more streamlined approach will provide meaningful information to the customer.

9. Under what conditions would it be appropriate to include an energy rating in an upgrade project?

Before determining whether a rating is appropriate for an upgrade project, the CEC should first consider who is the "customer of the rating." Only after determining who the rating customer is, should the rating type and rater credentials be established. The table below contains PG&E's recommended framework.

| **Customer of Rating/ Score** | **Type of Rating** | **Cost of Rating** | **Who Performs Rating** |
|---|---|---|---|
| Home Occupant | **Operational Rating**: Derived from Utility On-Line Services, or other programs accessing Green Button usage history; typically disaggregates by end usage and shows Red, Amber, Green score regarding relative usage. | Free for utility "on-line" users | Self-service by Customer or offered by third parties. |
| Prescriptive Incentive Program | **Home Energy Score** (DOE), with corrections for California TDV policy. Purported to be twenty basic inputs without diagnostic testing. Scale of 1-10. Also may become a version of "HERS Lite" | According to DOE, if already at the home, an incremental cost of thirty minutes. | Certified HERS II HES Rater; trained, listed, and monitored by CA HERS Provider and passes DOE exam. |
| Performance Incentive Program | Both a **HES/CA Score** (for multiple listing) and a California **HERS II Asset Rating** | Requires Diagnostic Testing so may be two people for 3-4 hours | Certified HERS II Rater; trained, certified, and monitored by CA HERS Provider. For HES/CA must pass DOE exam. |
| Energy Efficient Mortgage Program Lender | Both a **HES/CA** Score (for multiple listing) and a California **HERS II Asset Rating**. May need | May or may not require diagnostic testing so 2-4 hours | Certified HERS II Rater; trained, certified, and monitored by CA |

| **Customer of Rating/ Score** | **Type of Rating** | **Cost of Rating** | **Who Performs Rating** |
|---|---|---|---|
| | to run Asset Rating in National Rating system mode (RESNET standards) | | HERS Provider. For HES/CA must pass DOE exam. |
| State of California | **HES/CA Score** (for multiple listing upon time of sale) | Assuming a Home Inspection is Standard procedure (and it is over 80% of the time) an incremental cost of under 30 minutes | Certified HERS II HES Rater; trained, listed, and monitored by CA HERS Provider and passes DOE exam. |
| Local RECO Program | **HES/CA Score and/or HERS II Asset Rating** | Depends on program. If prescriptive it is the short **HES/CA** ; if performance it is **HERS II Asset Rating** | Certified HERS II Rater; For HES/CA must pass DOE exam. |

10. At what other points in the life of a building would an energy rating be desirable?

The HES/CA rating should be the minimum value assigned to homes at trigger events that include publicly-funded Energy Upgrade programs, time of sale transfer disclosure, building permits for substantial alterations, and retrofit energy conservation ordinances.

11. What market barriers exist that limit the growth of the voluntary market for HERS ratings and assessments? Is there a role for ratepayer or public funding to overcome these barriers, if so, what level is appropriate and commensurate to benefits?

Unless the customer of the rating is well understood, there may be a push to establish unnecessarily onerous ratings, resulting in an overly complex and expensive system. By establishing a streamlined, easy entry HES/CA rating for basic packages and prescriptive programs, the cost of the rating is in concert with the benefit required by the service, although even the simple HES/CA rating will require several years of public funding support to become standard procedure. If a deep retrofit project is using Performance "Calculated" incentives, it may make sense to provide vouchers at the beginning and end of the process to support the substantial cost of home performance testing.

12. Is there a role for HERS providers and HERS raters in the whole house upgrade programs offered by utility providers or in financing offerings supported by public dollars?

Yes, to implement a consistent HERS/CA rating program, HERS providers are needed to train, certify, and monitor raters performing this service, as well as the full HERS II rating. Furthermore, given the constantly evolving code cycle and that energy efficiency retrofits should be viewed as a continual process, rather than "once and done", there will be a need for the ratings to persist over time and to be readily accessible to customers, realtors, appraisers, and lenders.

HERS providers should continue to serve as the central repository of the reports, as they are under existing state regulatory guidance.

13. What improvements could be made to the California HERS program and its use in utility whole house upgrade programs?

PG&E recommends that a tiered program be implemented that uses the HES/CA rating as a "triage test" to determine what level of investment in a rating/assessment is necessary. The DOE's Home Energy Score should be used as the basis for the streamlined test, with appropriate modifications to implement California's time dependent valuation. If a home is a candidate for deep retrofits and calculated, performance based approaches, then a HERS II simulation could be conducted, resulting in an "asset" based rating rather than an "operational" lifestyle basis rating.

More work is needed to ensure the HERS Program creates pathways to deep reductions that do not continue the current antiquated technologies and measure-based, incremental steps that ignore building science and logical steps. Though the Prescriptive path or packages of measures was developed as an easy entry point for contractors that would sunset, it appears that it is here to stay. However, to avoid building science mistakes, the logic of the energy efficiency implementation "loading order" needs to be carefully considered when making program design recommendations and rating/assessment recommendations and priorities. For example, treating ceiling insulation as a stand-alone measure with millions of implementation events that did not seal massive air leaks on the attic floor was a programmatic and building science mistake. It has become common practice in comprehensive home performance programs to have to vacuum out the retrofitted insulation to enable proper air sealing and re-insulation.

Furthermore, given that some of the next generations of HVAC technologies are expected to eliminate the need for ductwork, careful consideration is needed as to whether prescriptive and performance programs should replace forced air systems with the same concept forced air systems that exist today. It may make sense to develop a flexible system that allows HVAC systems less than 25 years old to make repairs and upgrades to existing systems until the new ductless approach is available.

California is a national outlier in the HERS world since it rightfully protects its advancements embedded in Title 24. However, California may wish to move to providing a HERS Ratings that meet National standards (RESNET), particularly if the customer of a California rating is an energy efficient mortgage program that requires consistent algorithms and assumptions across jurisdictions. Development of a standardized "input module" that can feed HERS II, RESNET, Title 24, IECC, and ACCA sizing should be developed so that modeling tools can internally calculate results in multiple modes depending on the customer of the rating. Current computing power should be able to generate multiple simulations in short periods of time.

## IV. WHOLE BUILDING PROGRAMS FOR LOW-INCOME CUSTOMERS ARE BEING PILOTED

Numerous pilot programs are underway to target multifamily and low-income housing retrofits.

**Questions:**
14. How do we address low-income consumers in whole building programs?

There are existing programs that address low-income consumers' participation in whole building programs. For example, the Multifamily Energy Upgrade California (MF EUC) Pilot is an extension of the existing statewide Energy Upgrade California (EUC) Program within the statewide residential energy efficiency sector and is planned for launch in PG&E territory in 2013. EUC currently delivers comprehensive energy efficiency upgrades tailored to the needs of existing single family homes and their owners, as well as up-to-4 unit buildings in PG&E service territory.

The MF EUC Pilot Program will specifically target the multifamily housing retrofit market. The Pilot will promote long-term energy benefits through comprehensive energy efficiency retrofit measures, including building shell upgrades, high-efficiency HVAC units, central heating and cooling systems, central domestic hot water heating, and other deep energy reduction opportunities. These energy efficiency measures will be identified through an investment grade assessment. This performance-based approach aims to assist property owners and managers with making informed decisions, identify measures for energy savings, and to maximize energy reductions for each property owner, manager, and tenant, as applicable.

This Pilot will integrate with the existing Energy Savings Assistance Program (ESAP) and Multifamily Energy Efficiency Rebate (MFEER) Program. It will provide comprehensive services to the building, including "low cost" or "no cost" measures in conjunction with the multifamily Energy Upgrade California incentives to maximize energy savings for the up-front investment and will continue to advance to integration of low-income, moderate income, and market rate units within a single building. Additionally, low income tenants (ESAP) may qualify for additional "no cost" energy saving measures.

15. How can low- to moderate-income consumers gain access to deeper upgrade projects?

In Decision (D.) 12-08-044 in the CPUC's Low Income Proceeding, several working groups and studies were authorized to explore how low- to moderate-income consumers should participate in deeper upgrade projects. This work will be completed during 2013 and the CEC should encourage all interested parties to participate in the CPUC process so that the CEC can use the information developed in that proceeding to inform how these consumers should access these programs, rather than developing a separate, duplicative process to address the same issues.

16. How can whole building programs be meshed with existing low-income programs? What barriers would need to be overcome? How can the fact that multifamily buildings have a mix of tenants that qualify for low-income assistance and tenants that do not qualify, be addressed so that whole building upgrades are feasible?

The MF EUC Pilot will field test a single-point-of-contact approach to guide property owners through the incentive and retrofit process for multifamily properties and will not be limited by

income qualification requirements. This approach will provide support to the building owner in understanding the various program rules and assistance in determining eligibility. The property owner will be guided through a "clipboard audit" to establish feasibility and to estimate project cost for MF EUC, with an eye toward leveraging all eligible programs. The single point of contact will assist in identifying which utility program, or combination of programs, best meets the building owner's goals and budget. In addition, the property owner will be referred to known financing programs available at the time of the upgrade. The goal of this process is to reduce building owner confusion while simultaneously helping the building owner maximize energy savings and tenant quality of life.

Low income tenant units in a multifamily building will be treated first with the installation of all eligible ESAP measures. Then, the remaining market rate units will be treated through the Multifamily EUC path.

CPUC D.12-08-044 in the Low Income Proceeding ordered a Study to characterize and recommend ways to more effectively treat the Low Income multifamily segment. This Study will be completed by June 2013 and the CEC should consider the results of that study.

17. What are effective strategies for overcoming the split-incentive barrier, such as when building owners pay for the energy efficiency improvements but the benefits accrue to the renters?

To address the split incentives and cost of upgrades, the MF EUC Pilot will integrate with the existing ESAP and MFEER Program. This will provide comprehensive services to the building, including "low cost" or "no cost" measures in conjunction with the multifamily Energy Upgrade California incentives to maximize energy savings for the up-front investment. Additionally, low income tenants (ESAP) may qualify for additional "no cost" energy saving measures.

Incentives will assist property owners or managers with overcoming a wide array of market and financial barriers which may otherwise prevent energy efficiency upgrades. In addition, the MF EUC pilot will target properties with planned or in-progress renovations to minimize time-burden and lost rental income

18. What lessons learned from the San Diego multifamily whole building pilot should be extended into a statewide program? What issues need to be addressed?

PG&E plans to continue to work closely with SDG&E regarding lessons learned in the SDG&E pilot. Preliminary areas for further examination include 1) ensuring a flexible program design to address a diverse building stock; 2) creating robust policies and procedures for addressing indoor air quality and combustion appliance safety testing that rely upon industry standards (as available); 3) continuing to leverage a single point of contact to help building owners navigate through the process; 4) continuing pre-screening to help determine which programs are the best fit for each property owner; 5) maximizing outreach to building owners with planned rehabilitation; and 6) coordinating with local governments, financing programs and other

resources available to multifamily property owners and tenants to maximize energy savings and available funding sources.

## V. CUSTOMER PRIVACY MUST BE CONSIDERED WHEN DEVELOPING DATA ACCESS GUIDELINES

Efforts are underway to coordinate and streamline the access to customer-specific energy usage data in compliance with the CPUC's privacy rules, as well as other applicable law.

19. What can be learned from the California Solar Initiative (CSI) online database experience that can be extended to energy efficiency upgrades?

PG&E is still evaluating how the CSI online database experience could be extended to energy efficiency upgrades and may provide comments on this topic at a future date.

20. What are the major barriers to accomplishing comprehensive data collection and centralized public access to market data?

As PG&E discussed at the recent October 11- 12 CPUC workshops on customer privacy rules and data access, PG&E has not identified any major barriers to providing appropriate access to useful energy usage data for purposes of AB 758 building energy efficiency ratings. PG&E entered into a non-disclosure agreement with the Energy Commission in October, 2011 for purposes of sharing AB 758 related energy usage data, and under the agreement, both PG&E and the Energy Commission have agreed to coordinate and streamline the process for obtaining customer consent for access to customer-specific energy usage data in compliance with the CPUC's privacy rules as well as the California Information Practices Act, Civil Code Sections 1798, *et seq.* In addition, PG&E is working with building owners to streamline the process that landlords and other building managers need to follow under the CPUC's customer privacy rules in order to obtain consent from utility customer tenants to share customer-specific energy usage data for purposes of implementing AB 758 programs. In addition, under PG&E's CPUC-authorized "Green Communities" program, PG&E routinely shares non-customer specific energy usage data with local governments for climate planning purposes under non-disclosure agreements. PG&E also shares similar data with academic and government researchers under similar non-disclosure agreements for the benefit of its customers or its utility services, and where the arrangement is not. PG&E and the other California investor-owned utilities also have applications pending before the CPUC to approve customer data access programs where customer-specific energy usage data would be made available to third parties on a more centralized, aggregated basis at the direction of customers. A CPUC decision is expected in 2013, with implementation in 2014.

21. What safeguards exist for protecting consumer information while still allowing access to data?

See response to 20.

22. What options exist to collect pertinent energy savings and market characterization data without collecting personal and business sensitive data?

See response to 20.

23. What emerging initiatives hold promise to utilize smart meter data to inform decision making by homeowners/business owners/contractors/financers?

See response to 20. In addition, PG&E has implemented the "Green Button" program with the support of the US Department of Energy and White House, as a streamlined program for customers and third-party energy management application developers to share customer-specific energy usage data for purposes of enabling customer-directed energy management applications and tools.

## VI. ENERGY PERFORMANCE TOOLS SHOULD BE TAILORED TO CUSTOMER NEEDS, BE EASY TO USE, AND INEXPENSIVE

With more and more information being available to customers about their energy usage, the focus should be on development of flexible, innovative products that provide meaningful information to customers.

24. How can energy performance tools be used successfully in the multitude of nonresidential business markets in the state? Can these tools be cost-effectively deployed in small and medium buildings?

Energy performance tools (i.e., energy assessment, benchmarking, commissioning) have been used for many years across all sectors of the nonresidential business market. They can continue to be used successfully in this area, even though the nonresidential business market is very diverse in terms of key variables, including size, business drivers, business complexities, energy usage and savings knowledge. These variables are best addressed with tools that are tailored to customer needs, are easy to use and implement, and are cost effective for the customer and society. In its proposed 2013-2014 Energy Efficiency Portfolio, PG&E expects to continue to deliver performance programs and products that have proven effective and it also outlines other enhancements, additions, and testing of concepts for new performance programs and products (i.e., Whole Building Approach).

The IOUs are actively studying ways that performance data, whether collected at the device, system or building-level, may be cost-effectively collected and utilized to support commercial program goals. For example, the collection and utilization of performance data is a key element of PG&E's planned WBA-based program activities, including the proposed Whole Building Demonstration. A key goal of these activities is to prove that, through emerging technology and advanced modeling techniques, interval meter data can be leveraged to offer cost-effective incentives for measures that produce device (i.e., retrofit), operational and behavioral savings. Under this concept, energy use baselines would be produced using either calibrated simulation or EMIS software to achieve the requisite level of savings quantification accuracy.

PG&E is currently exploring alternatives for evaluating the accuracy of base lining tools, as PG&E anticipates this will be a concern for any WBA-based programs that base incentives and claimed savings on the energy use baselines produced by these tools.

PG&E plans to also test the use of performance data in Core retro-commissioning and monitoring-based commissioning program offerings. As mentioned above, however, there are a number of technical and evaluation considerations that must be addressed before use of performance data can be fully integrated into some of these core programs.

25. What is the proper role of public and ratepayer funded programs to increase the access to, and penetration of, energy performance tools for nonresidential buildings?

For several years, PG&E has worked in coordination with the public sector (i.e., Local Government Partnerships) to inform and educate nonresidential customers on available energy performance tools. This partnership is expected to continue into the 2013-2014 energy efficiency portfolio implementation and future cycles. Cooperative efforts are the most appropriate and effective means to have public and ratepayer programs continue to work in tandem to deliver energy performance tools and develop new tools and delivery strategies to better address business customer needs.

26. Is it appropriate to require performance ratings for all nonresidential buildings sometime in the future? Should building performance ratings be publicly disclosed?

It is not practical to require performance ratings for all nonresidential buildings in the near future for many reasons, including the size of this market, the customer diversity within the nonresidential business markets, the lack of cost-effective performance tools for much of the market, and the potential cost to both the customer and society to do so. However, there are market segments within the nonresidential business market (i.e., medium/large buildings) where performance ratings may be established in a cost-effective way today. The IOUs, CPUC, CEC and market stakeholders should work collaboratively to identify where required performance ratings make sense today, and to develop a roadmap for assessing new and cost-effective performance tools for the future.

27. Is it appropriate to require monitoring equipment in certain types and/or sizes of nonresidential buildings to improve the persistence of public and ratepayer funded efficiency improvements?

No. It may be more appropriate to encourage and incent, rather than mandate, performance monitoring equipment in this sector. Encouraging innovation in areas that leverage data that already exists (SmartMeter data, energy management system data) and apply new collection hardware and software applications that can turn readily available data into meaningful information for all to use would be more appropriate during this critical development and testing stage of the program. Mandating monitoring equipment at this point will likely lead to a less-than-desirable outcome in terms of the development of transformational tools in an area that is quickly changing.

## VII. IOUS ARE WELL POSITIONED TO ADVANCE WHOLE BUILDING UPGRADE PROGRAMS

Existing customer relationships and established programs are important credentials to advance customer adoption of whole building upgrade programs.

28. How can whole building upgrade programs be encouraged in the nonresidential sector? Should advanced upgrades for specific equipment (e.g., advanced lighting or HVAC controls) be considered "whole building?" What should the criteria be for considering a program "whole building?"

California IOUs and their channel partners are especially well positioned to market whole building upgrade programs for both large and small commercial customers. California IOUs have existing customer relationships with all commercial customers in their service territories and they bring valuable brand recognition and legitimacy to prospective project bidders. California IOUs are also well positioned to leverage interval meter data to support savings quantification for project savings estimation, customer reporting and program evaluation.

Even with these credential, marketing whole building upgrade programs, especially those which are performance based, will be very challenging for several reasons. First, deep energy savings come at a higher cost to the customer, even after incentives. Second, commercial building customers are often skeptical of the energy savings claims of prospective project implementers and participating vendors. Third, commercial building customers are not accustomed to taking performance risk (applicable to performance-based programs only). Finally, the ownership, management, operation and use of buildings are often not within the purview of single counterparty, but rather multiple counterparties, each with different motivations and incentives. PG&E and its statewide IOU partners recognize that the marketing challenges for whole building upgrade programs are pervasive and are considering coordinating their marketing efforts to maximize their cost-effectiveness.

The criteria for considering a program to be "whole building" would generally include multiple measures, rather than an upgrade for a single piece of equipment, although whole building methods could be used to evaluate the savings impact of that particular measure. For example, PG&E does not view advanced controls systems a single equipment upgrade, but rather a package of computer processors, relays, controllers, sensors and control points. Therefore, installation of an advanced control system would likely qualify as a sufficiently comprehensive retrofit measure for inclusion in a whole building upgrade program.

While PG&E has yet to define its criteria for a whole building upgrade program, key criteria include: 1) the significance of the targeted savings; 2) the comprehensive nature of the intervention (and if applicable, the use of multiple measures); and 3) the measurement and valuation methodology for savings estimation and measurement.

29. Given the diversity of nonresidential businesses and buildings, which energy saving strategies, tools and implementation approaches can be applied across the diversity? What are the conditions that will necessitate unique program elements to improve the efficiency of specific sectors of the nonresidential building market?

The enormous diversity of commercial businesses and buildings means that a "one size fits all" approach to both program design and program evaluation will simply not work. PG&E's initiative to test the concept of whole building upgrade programs is based on this fundamental reality. PG&E does not expect a Whole Building Approach will displace its current approaches to customized or deemed programs, but will rather complement them, affording a larger number of commercial buildings and customers an opportunity realize meaningful energy savings.

There are many conditions to consider in program development, but one that is especially important is customer intelligence. PG&E's investment in SmartMeter infrastructure positions it well to better target its efficiency programs to commercial and residential customers, and PG&E is investing in the tools and platforms to realize this opportunity.

30. What workforce development is needed to meet the efficiency goals in nonresidential buildings? How can workforce development be better integrated with the delivery of energy efficiency upgrades?

To meet efficiency goals in the nonresidential buildings, training is needed for commercial building operators of all sizes (i.e., small, medium, and large), auditors, owners, and building managers, all of whom make decisions about building maintenance or have direct access to decision makers. Other training should provide hands-on education and information on improving implementation through programs like PG&E's Tool Lending Library, which provides the commercial building workforce with the equipment necessary to understand and diagnose potential energy savings opportunities.

Training programs should also focus on consistency in the delivery of training on rating system implementation, with trainer training and trainer certification. Furthermore, industry certification of commercial raters is needed, although no standardized, recognized credential currently exists.

31. What barriers are there to achieving upgrades in small nonresidential buildings (less than 25,000 square feet)? What strategies exist for overcoming the split-incentive barrier in small nonresidential buildings, such as when building owners pay for the energy efficiency improvements but the benefits accrue to the tenants? What community or business organizations can serve as partners for overcoming the barriers in achieving upgrades for small nonresidential buildings?

There are two principal barriers to achieving upgrades in small nonresidential buildings: cost effectiveness and customer limitations on obtaining funding to perform energy upgrades. PG&E has been addressing the hard-to-reach small and medium business customers (SMB) through targeted and integrated marketing that combines informing and educating customers on pending

TOU and PDP rate changes with application of DSM to help control energy costs, on-line energy assessment tools and backroom support services. New customer financing options should help more small customers obtain the capital to do energy upgrades.

PG&E and the other state IOUs are working with the CPUC to determine how best to address the tenant/landlord barriers to implementing energy upgrades. The IOUs are planning to hire an expert consultant in tenant/landlord relations to both investigate what other utilities across the US are doing to address the tenant/landlord barrier and to develop recommendations for overcoming these barriers within California. PG&E is also planning to target additional Third Party solicitations in early 2013 toward the tenant/landlord market.

PG&E works with many Community and Business Organizations as well as its Local Government and Third Party partnerships to help address the nonresidential business market.

32. What role should continuous commissioning play in nonresidential building upgrade programs?

Cost-effective continuous commissioning can be a significant tool for bringing a building's performance within design specifications and sustaining that level of performance long term.

## VIII. A BALANCED APPROACH TO PROGRAM IMPLEMENTATION IS NEEDED

33. What is the proper role for regulations to achieve energy efficiency through AB 758? What are the appropriate points in the life of buildings (trigger points) where regulations could be applied?

Given the energy upgrade industry is still in its infancy, it is important to focus initially on consumer protection and safety and to allow the industry to generate momentum. At this time, the best point of regulation may be in the area of support to local building departments to enforce the existing building code. Given building retrofits are more complex than new construction, additional work in this area could be of value before instituting more rating requirements.

Once the market becomes a bit more mature, requirements to rate and label buildings could be considered. Trigger points for rating a building could include time of sale, major alteration, or local ordinance requirements for residential. The use of incentives and voluntary approaches should set the stage for such future requirements once the marketplace has advanced and customers are more accustomed to the idea of building ratings.

34. How could the real estate industry play a role to encourage assessments, rating and upgrades as a means of differentiating homes where owners have invested in upgrades?

Both the real estate industry and customers need to value energy efficiency benefits for them to play a role during the purchase and sale of a home. Starting with voluntary recognition of these upgrades, which would then be reflected in an increased value of the building will help build

momentum towards a future where the most efficient buildings are valued appropriately relative to the investments made in them.

Basic, streamlined HES/CA ratings are another component in advancing home differentiation and they could allow the real estate industry a means to showcase an upgraded home's value and to encourage home seller's investment in energy efficiency measures prior to sale. While realtors may be concerned about delayed closing of a sale if energy efficiency measures are in process, such concerns could be addressed through the establishment of escrow account, with specified time periods (e.g., 90 days) for the work to be completed. Eco-Brokers and Green Realtors are already seeing the advantage of differentiating their services from competition by fostering energy saving improvements. Streamlined HES/CA ratings could ultimately become a standard part of Multiple Listing Services and a way to facilitate transfer disclosure that realtors can embrace. Since home inspections are practically standard, the added cost of completing and registering the HES/CA rating should not be onerous.

35. Should non-energy benefits (NEBs) be recognized in cost-effectiveness criteria for an upgrade program, and if so, how? Are there important distinctions between ratepayer-funded and other publicly funded upgrade programs in how NEBs are addressed?

An energy-only cost-effectiveness test is most appropriate for determining program cost-effectiveness when a program is being evaluated against other demand-side or supply-side resources. A societal cost-effectiveness test may be appropriate if the state is implementing a policy that requires evaluation of demand-side or supply-side resources relative to non-energy based alternatives. Developing reasonable estimates of the relative NEBs impact between demand-side, supply-side or other societally-desirable options is likely to be a contentious and time consuming undertaking. Furthermore, as stakeholders discussed at the recent CPUC workshops on demand-side resources' cost-effectiveness methodologies (June 28-29, 2012), there is concern among stakeholders regarding whether it is appropriate to include NEBs (and non-energy related costs) in cost-effectiveness evaluations for demand-side programs that are funded through utility rates.

In general, PG&E supports the move to a "Participant Cost Adjusted Total Resource Costs (TRC) Test" as described in a Lawrence Berkeley National Laboratories' whitepaper on this subject, which was included in an August 14, 2012 Administrative Law Judge Ruling asking for stakeholder comment on demand-side cost-effectiveness methodologies.[3] The Participant Cost Adjusted TRC test addresses the current bias in TRC tests by removing the portion of participant costs incurred to procure NEBs for measures where EM&V studies indicate that participants are willing to incur significant costs to procure the NEBs associated with energy savings measures.[4]

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[3] http://docs.cpuc.ca.gov/PublishedDocs/EFILE/RULINGS/172816.PDF Attachment C: Addressing Non-Energy Benefits in the Cost-Effectiveness Framework, authored by Commission staff, based on research provided by Ed Vine of the Lawrence Berkeley National Laboratory.

[4] This way of handling NEBs is also suggested in the ACEEE paper, Jennifer Thorne Amann, *Valuation of Non-Energy Benefits to Determine Cost-Effectiveness of Whole-House Retrofit Programs: A Literature Review*, ACEEE Report Number A601, (May 2006)
http://psb.vermont.gov/sites/psb/files/projects/EEU/screening/Amann_ValuationOfNon-energy.pdf

36. What process improvements or funding solutions would facilitate better compliance with the Building Energy Efficiency Standards? What actions could be taken to encourage contractors to pull permits?

Better compliance with Building Energy Efficiency Standards could be achieved through a series of coordinated actions to improve compliance, including 1) increasing specific market actors' knowledge of the code requirements for alterations through role-based training; 2) simplifying the compliance process for alterations through tools and process improvements; and 3) generating home and building owner awareness of code requirements.

Specific examples of the activities currently underway in the areas of training, simplification of the compliance, and consumer and contractor education campaigns are noted below.

For training, the Codes and Standards team is delivering training to plans examiners, building inspectors and energy consultants. The training curriculum parses out how the code applies to "alterations" vs. "additions" vs. "new construction" vs. "repairs" and addresses what each of these market actors needs to do with respect to all types of "alterations." The Codes and Standards team is also offering training and job aids to specific trades and it will expand training to additional trades in 2013. Currently, Residential and Commercial HVAC change outs, quality insulation, fenestration and cool roofs are being addressed.

Compliance process simplification is being addressed through the Compliance Improvement Advisory Group and Building Department Best Practices Study. The Codes and Standards team has identified ways to simplify the compliance process for specific types of alterations, such as: allowing special permitting processes for Windows, HVAC change outs, insulation and water heating systems; and installing pre-screening kiosks in building departments that contractors may use to identify compliance requirements for their jobs.

The Codes and Standards team is also piloting numerous outreach and education campaigns, including a consumer/contractor outreach campaign designed to underscore that value of pulling permits and a contractor education forum during which a local building department will talk with contractors about permitting requirements. Results of these efforts will be reported by the end of 2012 and refined for implementation in 2013.

37. How should building energy simulation software be used to make recommendations for energy upgrades? How could actual energy use, before and after the upgrade, be considered?

Building energy simulation software has proven to be a useful tool in both evaluating a building's performance and in making recommendations for energy upgrades. However, it is not a cost-effective solution for all building types and projects. Development of more flexible, less expensive and better energy simulation software is needed, and the ability to integrate actual

building performance data collected through SmartMeterEMS and other monitoring equipment and energy simulation software would be helpful in the evaluation and adjustment of operational building performance.

38. Should California pursue a "HERS-lite" rating option (see page 65 of AB 758 Scoping Report)? Could this be used as a screening tool? How could it be used?

Yes. See table offered in response to Question 9.

39. How effective are workforce training efforts to prepare building officials, experienced contractors and new workforce entrants for energy upgrade programs? What education or training gaps exist?

As noted in response to Question 6, the Statewide Codes and Standards Program is delivering training to plan examiners, building inspectors, and energy consultants that focuses on teaching what each of these market actors need to do with respect to all types of "alterations." In each course, instructors administer pre- and post-tests to measure the participants' knowledge improvement. Quantitative analysis of the test scores indicate the average knowledge improvement per course is 20%. Qualitative analysis indicates that participants appreciate the Adult Learning Theory-based course design and the opportunity to receive coaching from very experienced code experts.

The Codes and Standards Program is also offering training and job aids to specific trades and will expand to additional trades in 2013. Currently, Residential and Commercial HVAC change outs, quality insulation, fenestration and cool roofs alterations are being addressed.

## IX. CONCLUSION

PG&E appreciates the opportunity to provide these comments and is happy to discuss them with the CEC staff. Should you have any questions about PG&E's comments, please do not hesitate to contact me.

Sincerely,

/s/

Valerie J. Winn

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