DOCKETED

Docket Number:	15-IEPR-05
Project Title:	Energy Efficiency
TN #:	205445
Document Title:	Pacific Gas and Electric Company_Governor's Energy Efficiency
Description:	N/A
Filer:	System
Organization:	Valerie Winn
Submitter Role:	Public
Submission Date:	7/21/2015 9:37:48 AM
Docketed Date:	7/21/2015

Comment Received From: Valerie Winn
Submitted On: 7/21/2015
Docket Number: 15-IEPR-05

Pacific Gas and Electric Company_Governor's Energy Efficiency_072015

Additional submitted attachment is included below.

Pacific Gas and Electric Company

Valerie Winn
Chief
State Agency Relations

77 Beale Street, B10C
San Francisco, CA
94105

(415) 973-3839
(415) 973-7226 Fax
Valerie.winn @pge.com

July 20, 2015

VIA ELECTRONIC FILING SYSTEM

California Energy Commission
Dockets Office, MS-4
Docket No. 15-IEPR-05
1516 Ninth Street
Sacramento, CA 95814-5512

Re: Docket 15-IEPR-05: Energy Efficiency – Comments of Pacific Gas and Electric Company on the Joint Agency Workshop on the Governor's Energy Efficiency Goals

I. Introduction

Pacific Gas and Electric Company (PG&E) appreciates the opportunity to provide comments on the July 6, 2015 Workshop on Governor Brown's 2030 Energy Efficiency Goals. PG&E has previously provided comments on several of the workshop topics in its comments related to the California Energy Commission's (CEC) Draft of California's Existing Buildings Energy Efficiency Action Plan (the Assembly Bill (AB) 758 Draft Action Plan),[1] and on the California Public Utilities Commission's (CPUC) April 28, 2015 Workshop on Energy Efficiency Baseline Choices.[2]

Since the 1970s, PG&E has been a leader in energy efficiency (EE) and has worked closely with government, nonprofit, and private sector partners to design and implement programs and policies that allow Californians to do more with less energy. PG&E's energy efficiency portfolio includes a robust suite of rebates, incentives, services, and tools to provide every customer choices from a comprehensive set of tools and technologies through multiple delivery channels to help them reduce energy usage and save money. These programs and services are supported by utility staff, government partnerships, trade professionals, retailers, distributors, manufacturers, and other third-party providers. From 2010 to 2014, PG&E's energy efficiency programs helped customers avoid the release of more than 2,000,000 metric tons of carbon dioxide (CO2), which is equal to the annual greenhouse gas emissions from nearly 460,000 passenger cars or more than 1,400,000 homes in PG&E's service territory.[3]

[1] PG&E Comments to the CEC on AB758 Existing Buildings Draft Energy Efficiency Action Plan, April 21, 2015.
[2] PG&E Comments to the CPUC on Energy Efficiency Baseline Choices (Rulemaking 13-11-005), May 28, 2015. Retrieved from http://www.cpuc.ca.gov/PUC/energy/Energy+Efficiency/Energy+Efficiency+Baselines.htm
[3] PG&E Internal Data from Customer Data Warehouse, 2010-2014 inclusive.

The key points of PG&E's comments are:

- PG&E is very comfortable meeting EE goals, which we have been doing for nearly 40 years. The current system of AB 32 and CPUC goals is working well and resulting in substantial energy savings. Setting an additional statewide target or goal is unnecessary.

- Any limits on EE in California have not come from the lack of a strong goal, but from a number of policy issues that need to be reconsidered. These are:
    - Use of a code baseline
    - An overly-narrow focus on attribution
    - Cost-effectiveness requirements that discourage EE when measure costs require large customer contributions.

- Market transformation efforts have great potential to drive even higher EE savings in the state. California investor-owned utilities (IOUs) are, and should continue to be, leaders in market transformation efforts. To maximize this potential, market transformation initiatives require a policy and evaluation framework that recognizes widespread adoption by participants and non-participants as a sign of success rather than an indication of failure.

During the July 6 workshop, comments were provided by numerous panelists. PG&E provides its key points on the topics presented by each panel below.

Panel 1: Accessing the potential for an EE Resource Standard for statewide electricity and natural gas sales

- The current process for setting statewide goals is not broken, and is, in fact, resulting in substantial savings for the state.
- Rigid targets to reduce energy sales may create unintended consequences of focusing on sales reduction rather than improvements in efficiency. These are described in more detail below.

Panel 2: Options for Heating Fuels

- From a customer's perspective, there is very little incentive to switch from heating with natural gas to electricity, as it is more expensive to heat a home and to heat water with electricity than with gas.
- From a GHG perspective, the benefits of fuel switching are not immediately apparent, as long as natural gas generation remains the marginal resource for generation.
- The focus should be on making natural gas systems and equipment more efficient, and on EE that reduces the need for heating, rather than on fuel switching.

Panel 3: Code and Existing Buildings

- Allowing to-code savings can:
    - Enable targeting of the state's least efficient buildings

  - Encourage deeper whole building upgrades and behavioral and operational energy savings
  - Increase the adoption curve for building upgrades and new efficient equipment

- Revising the state's cost-effectiveness requirements for EE and other demand side programs can:
  - Support novel program approaches
  - Encourage uptake of innovative EE technologies and products
  - Encourage support for EE programs and technologies that leverage customers' willingness to pay a portion of the costs of upgrades, rather than penalizing such programs and technologies

Panel 4: Market Transformation Strategies

- Market transformation initiatives are designed to drive both participant and non-participant savings, which is a broader definition than currently allowed under resource acquisition programs.
- California does not need another entity to help transform the EE market, but it does need a new policy and evaluation framework. The current framework penalizes market transformation initiatives that result in significant market adoption by participants and non-participants, as any initiative's success is attributed to exogenous market movement rather than the initiative. The market transformation policy and evaluation framework needs to be revised to characterize significant market adoption as a sign of success rather than failure.

III. PG&E Response to July 6, 2015 Energy Efficiency Goals Questions

PG&E appreciated the variety of stakeholder opinions put forth at the Governor's 2030 Energy Efficiency Goals Workshop on July 6, 2015. In the Workshop Agenda,[4] several specific questions were presented. PG&E responds to each as follows:

Panel 1: Accessing the potential for an EE Resource Standard for statewide electricity and natural gas sales

1. How will setting a statewide target for all of California electric and gas EE activities, including going beyond utility-driven programs, help to deliver greater energy savings in existing buildings? How might this be useful?

PG&E is a strong proponent of energy efficiency, the first resource in the state's loading order, and has supported the requirement to pursue all cost-effective energy efficiency. PG&E, along with the other IOUs, has successfully led the development of energy efficiency programs for

[4] Agenda for IEPR Commissioner Workshop on 2030 Efficiency Goals. Retrieved from: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=15-IEPR-05

California for nearly 40 years. The CPUC recently released its 2010 to 2012 Evaluation Report, finding: "With the inclusion of savings from Codes and Standards advocacy and low income programs, the utilities exceeded the statewide 2010-2012 electric gross savings goals by 47 percent; the demand goals by 11 percent; and the natural gas goals by 32 percent."[5] PG&E's commitment to energy efficiency is supported by a track record of success.

Current goal setting process is working
There is no evidence that the current regulatory structure guided by Senate Bill (SB) 1037 (Kehoe, Chapter 366, Statutes of 2005) requiring the CPUC to identify all potentially achievable cost-effective electric and natural gas energy efficiency is not working. The rigorous stakeholder process to determine utility goals has been successful in identifying cost-effective, feasible and market-ready goals and targets. This process is not based on retail sales of the utility.

Rigid targets to reduce energy sales will create unintended consequences
PG&E is very concerned that the proposed rigid targets will have the unintended consequence of promoting a reduction in energy consumption at any cost. Targets that define energy efficiency as activities that reduce demand for energy and implement a target that measures whether electricity and gas sales decline without regard for the reasons for the decline could be met by a recession or by encouraging businesses to move out of California, rather than by encouraging California customers to utilize energy more efficiently. PG&E encourages customers to use electricity and gas efficiently, not to shutter their doors. In addition, while PG&E strives to have every customer participate in its energy efficiency programs, these programs are voluntary and customers participate by choice.[6] Energy efficiency targets should be based on the potential for customer adoption of efficiency, not set as a percentage of retail sales.

2. What are the opportunities and challenges for achieving substantial levels of EE through non-utility funded programs and initiatives?

New business models that value efficiency as an energy resource are needed. Such models will allow efficiency to further displace the procurement of other energy resources and the associated costs of integration, and will enable investment by capital markets in energy efficiency resources. Examples of such models include Pay for Metered Performance models such as PACE Financing as well as PG&E's Commercial Whole Building Demonstration, which would align with such a model to enable better integration of utility programs with non-utility financing. Information on PG&E's Commercial Whole Building Demonstration can be found in Appendix A.

---

[5] *2010-2012 Energy Efficiency Annual Progress Evaluation Report.* California Public Utilities Commission. March 2015. pA-2. Retrieved from: http://www.cpuc.ca.gov/NR/rdonlyres/31854D3C-2096-4FEE-B562-DB3C5D6A3EF7/0/AppendixA_v002.pdf

[6] Letter from PG&E to Senator Ben Hueso, Chairman of the Senate Committee on Energy, Utilities, and Communications, regarding SB1330. July 2, 2015

3. What are the analytical requirements for setting "wedge" (EE advancement) targets, allocating these between utility-supported and other initiatives, and then tracking achievements over time?

PG&E notes that consistent counting of savings is extremely important for any "wedge" target. Such accounting also needs to align with CEC forecasting work to ensure that savings contributed by every entity are consistent in assumptions and can be incorporated into the forecast in a simple and transparent manner. This requires regular communication and coordination between the CEC, CPUC, administrators, and stakeholders. PG&E recommends that the wedges be set as a joint goal by major stakeholders, which would encourage stakeholders to seek synergies rather than compete over goals because of perceived overlap.

4. How should goal-setting and compliance assessment be structured to ensure statewide consistency and transparency? Is the RPS system an appropriate analogy?

As PG&E indicates above, additional goal setting and compliance assessments are not needed to advance energy efficiency initiatives. As discussed on page 3, evidence shows that the current system of AB 32 and CPUC goals is working well and resulting in substantial energy savings. There is no reason these goal processes cannot align with the Governor's EE goals, so no additional statewide target or goal is needed.

Panel 2: Options for Heating Fuels

5. Electrification of heating end-uses:

- **a. What might this look like?**
- **b. How soon should we start?**
- **c. Are there any special considerations?**

PG&E notes that the potential benefits of fuel switching need to be examined on a per-technology basis, and should include an analysis of the GHG and customer cost benefits.

As long as natural gas remains the marginal resource for electricity generation (which is likely until storage becomes feasible on a large scale), the GHG benefits of fuel switching are not immediately apparent.

From the customer's perspective, many electric technologies will be much more expensive for customers than gas technologies. For example, at current rates, a 64-gallon electric water heater would cost a customer approximately $700 more per year to operate than a comparable gas water heater. Obviously, this reduces the customer's incentive to switch fuels. In addition, greater use of electric water heating/or space heating will significantly increase the electric peak load requirements because these usages typically occur around the same time of day as the evening household lighting peak. To adjust for this, installation of more solar passive architecture in both homes and commercial buildings could prove more effective than wholesale fuel switching.

Therefore, PG&E recommends that, in the short-term, the focus should be on making natural gas systems and equipment more efficient. Technology exists to make gas water heating much more efficient and to reduce the demand for heating fuels through the tightening of building envelopes and sound insulation practices. While PG&E has been supportive of these types of initiatives, they typically involve costs which require large customer contributions. As a result, they may not appear to be cost-effective measures under the current implementation of the Total Resource Cost test which incorporates incremental customer costs, but not incremental customer benefits of the technology, into the calculation. Revisiting the existing cost-effectiveness requirements is needed to scale efforts in these areas.

6. Renewable Biogas:

a. What is the potential supply?

The technical potential of in-state biogas supply has been estimated by multiple studies, including two recent studies by UC Irvine for the California Air Resources Board[7] and the Bioenergy Association of California.[8]

Both reports estimate total technical potential of all biomass resources being converted to biogas. However, they do not consider economic factors, whether the resources could be diverted to end uses other than biogas, or other feasibility constraints. The estimates are based on a number of factors: definition of eligible resources, resource use by existing facilities, available technology, and prevailing regulatory environment.

Additional biogas supply is available throughout the United States and, while PG&E is unaware of a study estimating the quantity that could be available, there is no need to limit the source of biogas supply to in-state sources.

b. What issues arise for commercialization and market integration?

Potential concerns around use and integration of renewable gas potentially include but are not limited to: high commodity cost of gas as compared to current natural gas prices; high interconnection cost and complexity; and operational constraints on end-use products due to varying gas compositions (such as gas engines being de-rated for using certain types of renewable gas).

---

[7] UC Irvine for the California Air Resources Board. *Assessment of the Emissions and Energy Impacts of Biomass and Biogas Use in California.* March 2015. Retrieved from http://www.arb.ca.gov/research/rsc/1-30-15/item6dfr11-307.pdf

[8] Bioenergy Association of California. *Decarbonizing The Gas Sector: Why California Needs A Renewable Gas Standard.* November 2014. Retrieved from: http://www.bioenergyca.org/wp-content/uploads/2015/03/BAC_RenewableGasStandard_2015.pdf

c. Would there be an economic advantage for using biogas in buildings vs. in industry and/or the transportation sector?

PG&E has not performed an economic analysis of the different end-uses of biogas. However, the use of renewable gas in transportation would provide the greatest GHG benefit by displacing high GHG petroleum fuels. Using renewable gas in the transportation sector would also generate credits in the Low Carbon Fuel Standard (LCFS) market.

Additionally, there may be economic advantages to using renewable gas on site, rather than using it in buildings. On-site use of renewable gas may avoid potential gas up-gradation, conditioning and injection costs that pipeline injection (to transport the gas to a building) would require.

d. Are there any transition issues to address?

As with every new resource and technology, it would be reasonable to expect some transition issues for widespread use of renewable gas across multiple sectors. These transition issues would be determined by type of end use, type and composition of displaced fuel, and prevalent pipeline gas quality standards.

Panel 3: Code and Existing Buildings

The Governor's goal of doubling efficiency in existing buildings by 2030 and the objective of using energy efficiency to reduce GHG emissions point to a clear need for a new policy approach to energy efficiency in California. This policy approach should create market conditions that encourage market actors to hunt out and reduce inefficiencies, especially in the state's least efficient buildings.

The most effective way to achieve these goals and drive further energy savings is to move from a widget-based energy efficiency programs to a system that measures reductions in energy use at the meter. Furthermore, to achieve the state's GHG emissions objectives, PG&E recommends that the cost-effectiveness of energy efficiency programs should not be disadvantaged by customers' willingness to install efficient, albeit costly, equipment that supports the state's ability to meet GHG emissions reduction objectives. The Governor's goal is bold, and achievable only under a new baseline evaluation framework.

Current CPUC policy leads to a large pool of stranded energy efficiency savings potential, because program administrators can only target energy savings attributable to the installation of equipment above current Title 24 levels. Under this policy, savings opportunities that could be achieved by bringing older buildings up to (and then beyond) current Title 24 are not pursued, nor are customers encouraged to maintain or repair equipment and optimize the energy efficiency performance of existing equipment in buildings (retrocommissioning). These are

critical activities that must be pursued if we are to achieve the Governor's goal of doubling efficiency in existing buildings.

For customers with inefficient equipment, poorly-tuned buildings, or behaviorally driven overconsumption, the incentive amount program administrators can offer (only for the portion exceeding Title 24) may be insufficient to motivate the upgrades and changes in practice required, as the portion of the costs for which no incentive is available may be substantial. This results in deferred projects and stranded savings potential. Preliminary results from two complementary studies have provided quantitative evidence that the potential above-code savings in existing commercial buildings are smaller than the to-code and operational savings potential.[9]

The most effective way to achieve deep savings in the state's existing building stock is to leverage the large investment in SmartMeters to engender a shift from a widget-based energy efficiency system to one that measures reductions in energy usage at the meter. This type of approach has several advantages.

First, the use of meter-based savings would encourage deeper retrofits in existing buildings and energy savings resulting from behavioral changes, maintenance, and operational optimization. A system that "rewards" widgets can drive customers to maximize the use of those widgets (e.g., to maximize the incentive received), rather than to design projects to achieve the largest levels of efficiency at a whole building level. For example, the application of 2013 Title 24 Building Codes and Standards has led to a large increase in "39 lightbulb" projects, as this is the threshold that triggers compliance with the code requiring lighting control systems and whole-building lighting upgrades. San Diego Gas and Electric reported on this phenomenon in their response to the CPUC's April 28th Workshop on Energy Efficiency Baselines:

> *In the months since the implementation of 2013 Title 24, 182 Direct Install customers have modified exactly 39 fixtures as part of their lighting retrofit, which represents 5.2% of all lighting projects performed during the intervening time. Prior to the new code, only 0.6% of all lighting projects involved installing "exactly 39" fixtures. The 2013 Title 24 trigger for whole-building lighting upgrades is 40 fixtures.*[10]

Second, current policy does not provide the proper framework for targeting EE programs at the state's least efficient buildings and equipment stock. In fact, the code baseline policy has the effect of making EE program incentives amounts larger, per unit of potential energy savings basis, for buildings that already perform at or near code level. Perversely, limited incentive

[9] PG&E Comments to the CPUC on Energy Efficiency Baseline Choices (Rulemaking 13-11-005), May 28, 2015. Retrieved from http://www.cpuc.ca.gov/PUC/energy/Energy+Efficiency/Energy+Efficiency+Baselines.htm

[10] Comments of San Diego Gas and Electric on CPUC's Request for Comments on the Baseline Workshop. May 28, 2015, p.2. Retrieved from: http://www.cpuc.ca.gov/PUC/energy/Energy+Efficiency/Energy+Efficiency+Baselines.htm

support is provided to address inefficient buildings. This is demonstrated in further detail in Appendix C.

Furthermore, as noted in PG&E's presentation at the workshop, two preliminary studies conducted by FirstFuel and EnerNOC indicate that around two-thirds of the energy savings potential in existing buildings is in to-code savings. This indicates that, given the large amount of to-code savings prevalent in California's existing building stock, the State could achieve more energy savings by addressing the significant potential that exists in bringing these less efficient buildings up to and beyond modern codes and standards.[11]

Finally, to achieve deeper savings and to target the state's least efficient buildings, a shift to measurement of savings at the meter will streamline the state's EE system. A significant share of the state's EE budget and substantial resources from both CPUC and EE program administrators are expended on evaluation, measurement, and verification (EM&V) and the determination of the "code-baseline". Given the difficulties in measuring what would have happened "but for", the current system is too complex and relies on non-empirical methodologies. A move to meter-based savings would remove a large portion of this burden and allow those newly-freed resources to be repurposed towards achieving additional energy savings in the state.

PG&E Response to Specific Topics Regarding Panel 3

Risk of free-ridership in an existing conditions baseline framework
Using an existing conditions baseline, in combination with estimating energy savings based on reduced metered energy consumption, could have several potential consequences. These include the possibility of some customers receiving incentives for projects they would have done without the incentive program, customers with highly inefficient buildings conducting projects they would not have done otherwise; customers implementing operational and behavioral changes, control systems, lighting redesigns to reduce the number of fixtures, and other elements to reduce overall consumption; and some funds currently dedicated to establishing, implementing, and evaluating Industry Standard Practice (ISP) and Early Retirement (ER) being repurposed.

Current energy efficiency program rules require adjustments to incentive levels and savings estimates to account for the fact that some projects receiving incentives would have happened without the program. This concept, referred to as "free ridership," is not a new issue. While changing the baseline to existing conditions may present additional complexity to assessing free ridership, there is a fundamental question of how much value assessing free ridership really provides. Considerable time, effort, and cost are currently allocated to this assessment; these efforts produce no GHG reduction benefits, nor do they advance energy efficiency measures in California's least-efficient buildings. Many other states opt to not spend the resources to do these

[11] "Achieving the Governor's EE Goal: Unleashing Potential in Existing Buildings." Presentation by Aaron Johnson of PG&E at the CEC's Governor's 2030 Efficiency Goals Workshop, July 6, 2015. Retrieved from: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=15-IEPR-05

calculations, instead deciding that there will be some decrement for free ridership and some increment for spillover and that the two will cancel each other out.[12]

Current understanding of code adoption and measure turnover rate
PG&E supports Dian Grueneich's comments at the workshop that more comprehensive research is needed to understand the code adoption rate in California, but that research need should not be a barrier to achieving state goals. PG&E supports the suggestion of a statewide forum to discuss and research this topic in greater detail.

Potential double-counting between Codes & Standards and Programs in an existing conditions baseline framework
Savings in any existing condition program should be accounted for appropriately. PG&E proposed an accounting framework to address this concern in its comments to the CPUC after its April 28, 2015 workshop on the topic.[13] It will be important to get the accounting right to maintain integrity of the program and enable meter-based savings, but PG&E is confident that continued discussions will deliver a solution to this challenge. Accounting should not be a barrier to achieving state energy goals nor should it be the primary roadblock to developing customer-friendly EE programs that maximize participation and savings.

The Current Ability of IOU Programs to Include To-Code Savings (Allowance of Early Retirement Exceptions)
For certain types of EE projects, CPUC policy allows savings to be measured from an existing conditions baseline, rather than code. The two instances where existing conditions are used as the baseline according to current CPUC policy are the Early Retirement (ER) and Retrofit Add-on (REA) measure classifications. The assumption for these measure classifications is that, absent program influence, the measures would not be installed, because in these cases, the existing system is fully operational and meeting the customer's operational needs.

However, existing policy is not enabling significant to-code savings because of challenges in the intricacies and implementation of them. In 2014, PG&E's Energy Efficiency Programs had 799 gigawatt-hours (GWh) and 25.6 million (MM) therms of total paid savings. Of these, 432 GWh (54 percent) and 23.3 MM therms (91 percent) were custom, and 367 GWh (46 percent) and 2.3 (9 percent) MM therms were deemed. Of the custom savings, only 15.7 GWh (4 percent) and .05 MM therms (0.2 percent) were paid using the Early Retirement exception, and of the deemed, only 17 GWh (5 percent) and none of the therms were successfully paid as "Early Retirement".

[12] A review of E Sources DSM Insights tool, a tool that compiles publically available EE program results, on 7/20/2014, shows that Connecticut, Massachusetts, Oklahoma, and Washington all have net and gross values that are very similar, likely indicating that spillover and free-ridership cancel each other out in these states. Several states also showed portfolio net savings values that were greater than gross values, suggesting very generous spillover calculations; these states included New York and Pennsylvania.

[13] PG&E Comments to the CPUC on Energy Efficiency Baseline Choices (Rulemaking 13-11-005), May 28, 2015. Retrieved from http://www.cpuc.ca.gov/PUC/energy/Energy+Efficiency/Energy+Efficiency+Baselines.htm

Overall, the savings that were paid under the Early Retirement exception represent only 4 percent of PG&E's total portfolio paid savings.[14]

The ER program requires IOUs to demonstrate by a "preponderance of the evidence" that their EE program influenced and accelerated the retirement of the less-efficient equipment by at least one year ahead of its Remaining Useful Life (RUL). This requirement creates two barriers to the practical application of an early retirement project. First, many facilities continue to operate equipment long after the remaining useful life specified by the CPUC is past. Such projects are ineligible for early retirement. Second, the "preponderance of evidence" standard can be challenging to meet, and result in a frustrating experience for customers if a potentially higher incentive is discussed and then retracted by the IOU due to difficulties in meeting the standard. The 2014 Program results indicate that the "preponderance of evidence" standard results in only a small amount of program savings being captured under the ER option.

The REA program also does not significantly enable IOU programs to capture stranded savings. Recent CPUC correspondence[15] states that existing conditions should continue to be used as the baseline for savings in REA cases, while also stating that to *qualify* as an eligible measure, it must *exceed* the efficiency levels required by code. Other guidance has suggested that if a particular measure is "included in" Title 24, it will be ineligible for incentives under the REA program. While PG&E is still evaluating the impact of this recent correspondence, it appears that a number of measures previously used to enhance the efficiency of customers' existing equipment will no longer be eligible for incentives.

7. What do we know about current compliance by existing buildings with Building Energy Efficiency Standards (Title 24)?

The CPUC's Codes and Standards program evaluation results clearly indicate that Title 24 lighting alteration requirements have been successfully implemented in the state and that they generate real energy savings.[16]

Compliance rates can vary based on the sampling technique and the time period when the samples were collected. For example, CPUC evaluators recorded very low compliance rates for some products because the evaluation was performed shortly after the standard became effective and products that were manufactured before the new Codes and Standards became effective were still in stores and legal for customers to purchase. As these products are sold and replenished

[14] PG&E Annual Report. Submitted June 1, 2015. Program Savings without Codes & Standards.
[15] Memo from Katie Wu, Interim Supervisor, Industrial/Ag Programs and Portfolio Forecasting, CPUC to California Program Administrators. April 20, 2015
[16] *2010-2012 Energy Efficiency Annual Progress Evaluation Report.* California Public Utilities Commission. March 2015. pA-2. Retrieved from: http://www.cpuc.ca.gov/NR/rdonlyres/052ED0ED-D314-4050-9FAA-198E45480C85/0/EEReport_Main_Book_v008.pdf

with new models, compliant with the new code, compliance rates with the new standards will undoubtedly increase over time.

a. Any estimate of the level of EE impacts NOT being realized and why?
b. Are building owners foregoing projects altogether or avoiding permitting and inspection?
c. How does this vary across market segments?

At the workshop, both the California Business Properties Association and Heating Air-conditioning and Refrigeration Distributors International (HARDI) shared anecdotal evidence of building owners forgoing EE projects. PG&E has shared similar examples in its May 28, 2015 comments to the CPUC on code baselines.[17] As noted in those comments, PG&E has commissioned two research projects to guide the design of the to-code pilots and provide data related to the amount of to-code potential that exists in PG&E's service territory. While the results from these two research projects are currently being reviewed in the CPUC's EM&V study review process, and the final results may vary, the preliminary data analysis provides very insightful information on this topic. Both of these studies focused on potential energy savings that could be obtained by bringing older buildings up to more modern codes and standards. The studies did not examine the question of code compliance, but instead focused on estimating the extent to which existing buildings (built under previous generations of codes) have an opportunity to save energy if upgraded to and beyond modern codes.

The two studies use different approaches to determine the amount of to-code and above-code energy savings potential in a set of commercial buildings within PG&E's service territory. One of the studies also provides an estimate of operational energy savings potential.[18]

The first study, conducted by FirstFuel, uses a detailed remote audit approach to examine 164 commercial buildings[19] (offices, supermarkets, retail locations, and schools), almost all of which are in climate zones 12 and 13 (PG&E's territory in the Central Valley). Each of the buildings was remotely audited and the to-code, above-code and operational savings potential for 22 different energy savings measures was evaluated. The results indicate that, at the aggregate level, approximately two-thirds of energy savings potential is to-code while the remaining one-third is

[17] PG&E Comments to the CPUC on Energy Efficiency Baseline Choices (Rulemaking 13-11-005), May 28, 2015. Retrieved from http://www.cpuc.ca.gov/PUC/energy/Energy+Efficiency/Energy+Efficiency+Baselines.htm

[18] Operational savings are defined as savings achieved through the optimization of existing building equipment, including but not limited to HVAC equipment, lighting, refrigeration, and related control systems, via the identification and implementation of low/no cost measures, that reduce energy consumption and demand, and improve performance in buildings over time.

[19] This analysis includes 100 buildings that were randomly selected through a statistical sampling process (conducted by a third-party, Nexant) and uses remote audits of 64 buildings previously completed by FirstFuel for the PG&E Analytics Enabled Retrocommissioning program. Planned future work, expected to be completed by mid-2015, aims to expand the sample size by 100 – to a total of 256 buildings – by using remote audits being conducted for PG&E's Transmission & Distribution deferral pilot.

above-code. When operational savings are included, half of the potential energy savings are to-code, one-quarter are in operational improvements and only one-quarter are above-code. Furthermore, while there are buildings in the set for which most energy savings potential is above-code, this is not a majority of the buildings. Over one-third of the buildings analyzed have exclusively to-code and operational savings potential. Additionally, in over 90 percent of the buildings, a majority of the savings potential is to-code and operational.

The second study, conducted by EnerNOC, uses a big-data analytics approach to examine approximately 66,850 commercial buildings across multiple sectors and all climate zones in PG&E's service territory. While it has a larger building set than the FirstFuel study, the research is limited to only the three dominant building energy end-uses, which are identifiable through: heating, cooling, and lighting. The study compares usage and building data (*e.g.*, square footage and operating hours) to building models to evaluate actual consumption with that expected under 2013 Title 24 Codes and Standards and to quantify the to-code and above-code savings potential for these end-uses resulting from installation of high-efficiency heating and cooling equipment and reduced wattage T8 lighting systems. The preliminary results show a similar ratio of to-code and above-code savings as the FirstFuel study, with 70 percent of the total potential electric savings being to-code, while the remaining 30 percent of the savings potential was above-code.

Upon completion of the CPUC and stakeholder review process, PG&E looks forward to providing more detailed results on these studies. Further analysis of the research results can also provide insights into the types of buildings and end-uses that would be high-value targets of EE programs that make use of an existing conditions baseline.

Finally, another approach for evaluating the volume of deferred retrofits uses saturation survey data (or possible supplements to the survey) to identify the customers, technologies, building types, building sizes, and geographies that lag the overall market. The *2014 California Commercial Saturation Survey Report*[20] provides a good example of this. Appendix B provides greater detail about the volume of deferred retrofits in the lighting space.

8. What strategies are there for increasing compliance?

The Compliance Improvement subprogram under the IOU Statewide Codes and Standards Program is an effective and important strategy for increasing compliance savings. The Title 24 Compliance improvement program via Energy Code Ace is a fairly mature program that includes free energy code training, tools, and resources for those who need to understand and meet the requirements of Title 24. In late 2014, the IOUs started an Education and Outreach program for Title 20 and are working in coordination with the CEC to ramp up efforts. Despite these efforts,

[20] Itron, Inc. (2014), *California Commercial Saturation Survey*, available at http://www.energydataweb.com/cpucFiles/pdaDocs/1159/California%20Commercial%20Saturation%20Study_Report_Final.pdf.

there is still work to do to streamline the Title 24 compliance process. Suggestions have included developing a program similar to Turbo-tax that steps the code officials through the compliance process and generates appropriate compliance forms. Such a tool could be accessible in the field so a building inspector can enter information directly into a tablet on the go. Such creative solutions could help reduce the burden and inconsistencies in compliance reporting.

A second initiative could be to create an information repository for nonresidential buildings that could house data from all buildings that apply for Title 24 compliance. This repository would be a useful tool to help identify compliance gaps.

In addition, continuing efforts to simplify Title 24 could lead to improved compliance. Creating code language that is clear will minimize confusion in interpreting the code requirements.

PG&E is committed to these types of code compliance efforts, and notes that as technology and codes advance, there are significant energy savings opportunities in existing buildings that were code compliant at the time of their construction.

How do we pay for these?

The IOU Codes and Standards Compliance Improvement Program is funded as a subprogram under the statewide Codes and Standards program, and should continue to be a priority given the savings potential. In addition, CEC funding should be increased to better support the significant added responsibilities involved with stricter codes. Information technology investments such as equipment databases, an electronic code registry, and the electronic compliance manager for the commercial building energy compliance software, along with staff to support these efforts, are critical to tracking the program's success.

9. How well are the Energy Commission's and CPUC's economic methodologies for cost effectiveness working for us?

The current methodologies for cost effectiveness are not working well at promoting investment in the most efficient, albeit higher initial cost, technologies. At the workshop, Lawrence Berkeley National Labs (LBNL) noted that the meaning of cost effectiveness for the regulatory world is not the same as for the market. Current cost-effectiveness policies encourage the IOUs to promote technologies that meet the regulatory requirements for cost effectiveness, rather than technologies that yield more energy savings but don't meet the currently adopted cost-effectiveness standards. PG&E recommends that the cost effectiveness of energy efficiency programs not be penalized if program participants choose to pay a larger share of measure costs.

This is illustrated by reviewing how the Total Resource Cost (TRC) test, adopted in CPUC Decision 07-09-043, is calculated:

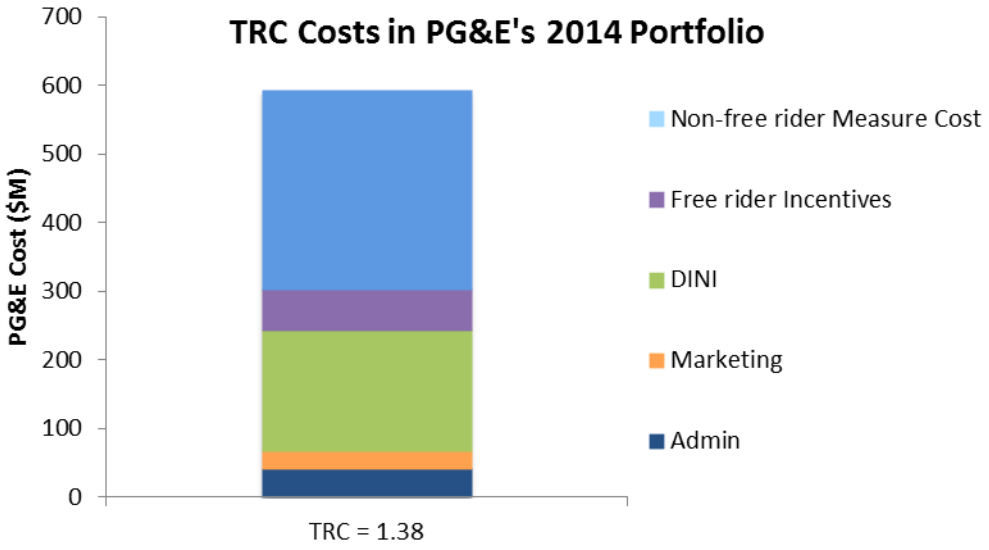
$$\textbf{TRC} = \frac{\text{Benefits} * \text{NTG}}{\text{Admin} + \text{Marketing} + \text{DINI} + \text{Free Rider Incentives} + \text{Non-Free Rider Measure Cost}}$$

where

- Free Rider Incentives = (1 – NTG) * Incentives
- Non-Free Rider Measure Cost = NTG * Measure Cost

Notes: DINI = Direct Implementation Non Incentives NTG = Net to Gross (non-free rider participants).

"Measure Cost" is the largest component of the costs associated with the Total Resource Cost test. For PG&E's 2014 portfolio, the Measure Costs account for 49 percent of the entire TRC cost to PG&E. In comparison, Administrative costs account for 7 percent, marketing for 4 percent, Direct Implementation Non-Incentives (DINI) for 30 percent, and Free-Rider Incentives for 10 percent.



Source: 2014 Portfolio with Spillover. PG&E Annual Report filed on 6/1/2015.

The same proportional breakout is seen when examining individual measures and programs. For example, for the Plug Load Appliance Program, Measure Costs account for 48 percent of the

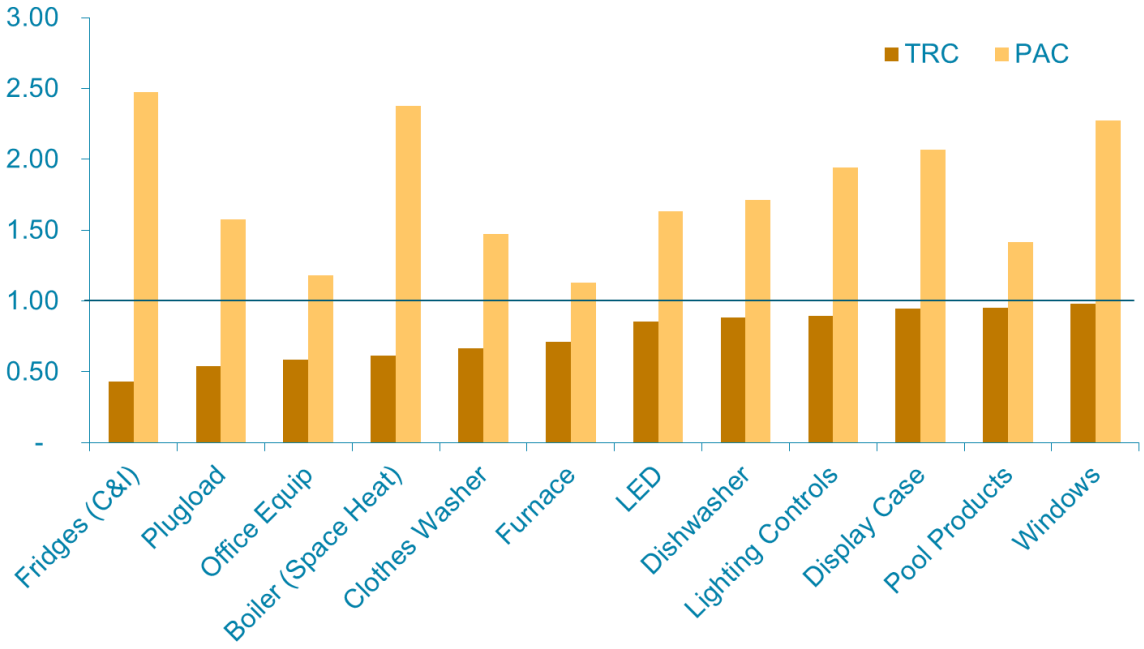
costs in the TRC test, while Administrative costs account for only 9 percent, marketing for 13 percent, DINI for 17 percent, and Free-Rider Incentives for 12 percent.[21]

The technologies shown below are disadvantaged under the current framework because they do not meet the TRC test due to the estimated incremental costs to participants to purchase the more efficient technology. These products tend to include a variety of advanced features and benefits that customers value, of which EE is only one feature. Customers' willingness to pay for the other features should not disadvantage these technologies in the EE programs. Many of these products do not yet have the volume required to narrow the cost gap between the advanced and standard product, which results in high participant side costs, which then result in a lower TRC score. These include products as varied as:

- ***Advanced boiler controls*** can make the equipment more efficient, easier to use, and programmable
- ***LED lighting*** is dimmable and of superior quality
- ***Efficient office electronics*** can offer a host of other features depending on the product – slimmer monitors being one
- ***Advanced furnaces*** are quieter
- ***Advanced dishwashers and clothes washers*** can be programmed, have numerous cycles, high spin speeds, etc.
- ***Lighting controls*** can include sensors and programming options that follow business schedules
- ***Display cases*** can be integrated with lighting controls to prevent cases from remaining lit if customers aren't in the store or aisle
- ***Windows*** have a variety of benefits: they reduce outside noise, have fewer air leaks, and look better.

Allowing these and other innovative technologies to be encouraged by IOUs and other program administrators will capture more energy savings and allow the State to leverage participants' willingness to pay for advanced technology features.

[21] Pacific Gas and Electric Company. Comments on the updated methodology for the database for energy efficiency resources. Submitted to the CPUC on June 29, 2015 under Rulemaking 13-11-005.



Source: PG&E recorded results, 2013 – March 1, 2015.

a. Should we modify or replace these methods to better align with the scale and pace needed to reach California's climate goals?

Yes. Properly valuing greenhouse gas reductions needs to be an ongoing priority and consideration when updating economic methodologies and cost-effectiveness models and approaches. PG&E recommends that when considering alternative approaches to reduce GHG emissions, the cost-effectiveness of energy efficiency programs be based upon comparison of the cost to obtain energy efficiency resources to the cost alternative resources. Customers' willingness to install efficient equipment should be an asset that supports the state's ability to meet GHG emissions reduction objectives rather than a detriment which reduces a utility's ability to invest in technologies that produce energy savings.

b. Whose capital should be used to achieve these goals – utility ratepayers, building owners, utility treasuries, government, and private capital?

Given that climate change will impact all stakeholders, effectively utilizing capital from all parties – utility customers, building owners, utility treasuries, government, and private capital—must be considered. Customer contributions are currently treated as a negative in EE cost-effectiveness valuation. These contributions should instead be treated as an additional resource in meeting the state's energy goals.

Panel 4: Market Transformation Strategies

Discussion of typical strategies used in market transformation and how they might augment the savings levels we see now from codes and standards or utility incentive programs.[22]

PG&E's portfolio of energy efficiency initiatives touches every customer segment and builds upon its strengths in coordinating with other IOUs, publicly-owned utilities, Northwest Energy Efficiency Alliance (NEEA), the Consortium for Energy Efficiency, U.S. Department of Energy, U.S. Environmental Protection Agency, retailers, distributors, and manufacturers. Our programs include both "resource acquisition" efforts, such as working with commercial and industrial customers on projects at their facilities, as well as market transformation (MT) initiatives designed to advance the manufacture of more efficient and high quality products (refrigeration, lighting, televisions), stocking of efficient products at wholesale distribution (HVAC), and support of trade professionals to sell more efficient equipment (HVAC, residential home upgrade). Resource programs and MT initiatives are complementary – both are designed to reduce consumption of electricity and natural gas by supporting changes in the market or at customer facilities.

PG&E supports a thorough public discussion about how California can be successful in MT, including a definition of MT that aligns with the CPUC white papers, establishing clear parameters and selection criteria for MT programs, and addressing key policy barriers to capturing MT effects.

No evidence was presented at the workshop that indicated that a change in MT administration would be beneficial, that a third party administration model is more successful, or that a different entity would have any more success under the current policy constraints. NEEA was pointed to as an entity that has had a lot of success in the Northwest, yet the California IOUs have collaborated with NEEA extensively and were key partners in the television market effort NEEA detailed at the workshop. In addition, Massachusetts follows an IOU-administered model, is the leading state in the country for energy efficiency, and has had significant success in transforming markets. The best example of this may be Massachusetts' home upgrade programs which are currently getting 1 to 2 percent of their residential customers to participate in their programs every year, which is considered a great success.[23]

A change in administration entity would be disruptive to the state's current MT efforts. A Regulatory Assistance Project report found that transitions of energy efficiency administration

[22] See also the April 16, 2015 letter from PG&E to Senator Ben Hueso, Chairman of the Senate Committee on Energy, Utilities, and Communications, regarding SB 765.

[23] MassSave: A New Model for Statewide Energy Efficiency Programs. ACEEE Summer Study on Energy Efficiency in Buildings, and American Council for an Energy Efficiency Economy, 2014 Scorecards. http://aceee.org/state-policy/scorecard.

are disruptive, whereas a motivated utility administrator can work well. The report stated: "It is our view that either utility administration or administration by a third-party non-governmental entity can work well. It is important to set up the system for success. A micro-managed third-party administrator might be an utter failure, and in any case, explicit attention to utility motivations to support or avoid energy efficiency is crucial. Equally crucial is commitment to a decision; frequent transitions are a bad sign."[24]

10. What California energy efficiency objectives or market segments are well-suited to such an approach?

To determine if a market is a good candidate for a market transformation initiative, a thoughtful evaluation must be performed. To maximize expenditures and properly value an initiative's success, it is important that MT efforts are well defined at the onset with clearly defined market indicators to evaluate success throughout the initiative's life-cycle. A particularly good candidate for a market transformation approach is Plug Loads.

On July 2, PG&E received a letter of commendation from the US Environmental Protection Agency's (EPA) Climate Protection Partnerships Division. The letter read, in part: "Most recently, PG&E has assumed a critical leadership role in designing and launching the ENERGY STAR Retail Products Platform (RPP), a nationally coordinated midstream program being developed by a group of utilities with facilitation by EPA. Under the auspices of the ENERGY STAR RPP, PG&E is collaborating with EPA and other leading utilities to evolve traditional retail-based energy efficiency program design, delivery, and evaluation to reflect the changing nature of the residential products market and capture remaining, hard-to-reach energy savings. Now representing many regions of the country, the ENERGY STAR RPP builds on the structure and learnings of an innovative pilot PG&E first tested in California in 2014, and the first pilots are expected to launch in 2016.

We commend PG&E on your significant contributions to transforming the market for efficient products and practices and protecting the environment for future generations."[25] The letter is provided in its entirety in Appendix D.

11. How much additional energy savings might be achieved or at what (lower) cost?

MT approaches have the potential to garner additional savings during the effort's life-cycle, as they are designed to drive both participant and non-participant savings, which is a broader

[24] Richard Sedano, *Who Should Deliver Ratepayer-Funded Energy Efficiency? A 2011 Update,* November 2011. http://www.raponline.org/document/download/id/4707%29

[25] Letter from Ann Bailey, Chief, ENERGY STAR Labeled Products, Climate Protection Partnerships Division, US EPA, to Aaron Johnson, Vice President of Customer Energy Solutions, PG&E. Email June 18, 2015; Letter July 2, 2015.

definition than currently allowed under resource acquisition programs. Approximate cost and detailed savings estimates would need to be calculated.

12. What organization model(s) could work in California? What policy, enabling, or funding changes would be needed?

Well-designed and executed market transformation initiatives should play a role, along with of code and incentive programs, in achieving the Governor's energy efficiency goals.

To accomplish this, California's MT initiatives need a new evaluation framework. To maximize potential, market transformation initiatives require a policy and evaluation framework that recognizes widespread adoption by participants and non-participants as a sign of success rather than an indication of failure. A separate MT entity is not needed. Rather, the market is best served by the IOUs leveraging their size and experience in this arena and continuing to play a significant role in market transformation efforts.

IX. CONCLUSION

PG&E thanks the CEC for the opportunity to review and provide comment on the Governor's 2030 Energy Efficiency Goals. PG&E looks forward to continued collaboration with the CEC and other state agencies on this subject in the future.

Sincerely,

/s/

Valerie Winn

cc: C.Smith by email (charles.smith@energy.ca.gov)

APPENDIX A – Commercial Whole Building Demonstration – Info Sheet

FACT SHEET

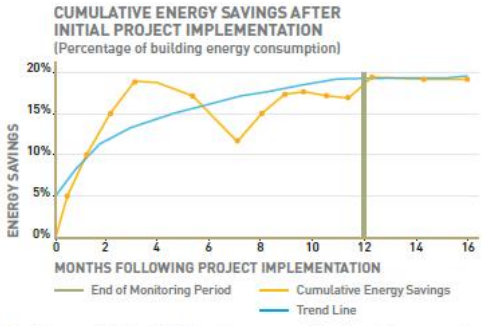
Commercial Whole Building Program

Earn premium incentives by taking a comprehensive approach to commercial building energy upgrades

Pacific Gas and Electric Company's (PG&E) Commercial Whole Building Program enables owners and long-term lessees of commercial buildings to achieve significant energy savings and receive premium, performance-based incentives for making comprehensive upgrades and other improvements. In partnership with U.S. EPA's ENERGY STAR® program, PG&E also offers participants support for goal setting, planning, and performance tracking.

Designed to achieve energy savings of 15 percent or more in commercial buildings, the Commercial Whole Building Program features incentives that exceed those currently available through other PG&E energy-efficiency programs, including PG&E Customized Retrofit and Retrocommissioning (RCx) programs. In addition to receiving a post-installation incentive, participating customers have an opportunity to earn a performance-based bonus that is tied to estimated energy savings using actual meter data.

Because the focus is on actual energy results, participating customers have the flexibility to pursue a wide range of energy-efficiency projects in order to achieve the largest possible energy savings in their buildings. These may include more traditional retrofit and operational projects (including controls retrofit or optimization), as well as innovative activities, such as reward or competition programs to encourage building occupants to make behavioral changes in their energy use.



The Commercial Whole Building Program provides incentive payments over time, rewarding participating building owners and long-term lessees not only for their initial energy savings, but also for cumulative savings.

Incentives

Incentives are based on energy savings determined at the building or meter level using PG&E interval meter data. Participating customers may earn a total incentive of up to 60 percent of eligible project costs, as compared to a maximum of 50 percent for PG&E's customized energy efficiency programs.

Incentives are paid in two installments. The first incentive payment is issued after an energy-efficiency project has been installed and completed. The second incentive payment, which is a performance bonus tied to actual energy savings, is issued after a 12-month monitoring period.

PG&E®

BUILDING PERFORMANCE WITH ENERGY STAR

Eligibility

This program is designed for commercial building owners and long-term lessees who are PG&E customers and are motivated to achieve significant energy savings. Prospective customers must specifically:

- Receive gas AND electric service from PG&E at each prospective site (preferably with 50 kW or more in electrical demand).
- Be a building owner or a triple-net lessee in a single-tenant commercial building (preferably 30,000 square feet or larger) that is served by PG&E and has stable operations on a historic and projected basis (i.e. no major occupancy changes during the past year or projected for the next two years), AND which may be classified as one of the following facility types: office, retail, grocery, governmental or educational.
- Be willing to identify and commit personnel with decision-making authority over budgets and building operations.
- Grant PG&E and its agents access to the building and to energy use data for evaluation, verification, and on-going monitoring purposes.

Benefits

This program enables qualifying PG&E customers who own or lease space in commercial buildings to reduce their energy usage through a single, integrated building program. Benefits include:

- An opportunity to earn incentives that are larger than those currently available through other PG&E customized energy-efficiency programs.
- The flexibility to pursue a wide array of energy-efficiency projects, including activities that encourage behavioral energy savings.
- A single, integrated application process for retrofit and retrocommissioning incentives.
- Access to periodic billing reports to track program progress and energy savings.

Process

Application	Assessment	Implementation, Verification and Payment
Once eligibility is confirmed, PG&E connects each prospective customer with an authorized third-party implementer who specializes in energy efficiency for commercial buildings. The implementer visits the identified building to evaluate it for energy-saving opportunities and provides the prospective customer with a detailed proposal that lists recommended measures, estimated project costs, energy savings, and PG&E incentives.	Customers will work with the same authorized implementer to develop a comprehensive energy-efficiency action plan that meets the program's requirements, and then submit the plan to PG&E for review. Once the action plan is approved, the customer and PG&E will enter into an incentive agreement that establishes the approved cost basis upon which the initial incentive is sized and the maximum incentive is determined.	Customers work with their authorized third-party implementer to complete the various energy-efficiency projects and activities. Once the action plan is complete, the implementer notifies PG&E to inspect the building and issue the first incentive payment. After an approximate 12-month monitoring period, PG&E will issue the second incentive payment, which is the performance bonus tied to actual savings.

Next Steps

Learn more about PG&E's Commercial Whole Building Program and whether your building qualifies. Contact your PG&E account representative by sending an email indicating your interest and contact information to **WholeBuilding@pge.com**, or leave a message on the Whole Building Hotline at **1-415-973-3803**.

September 2013 CLB-0813-2229

APPENDIX B – Effect of the To-Code Baseline Policy on Incentive Support

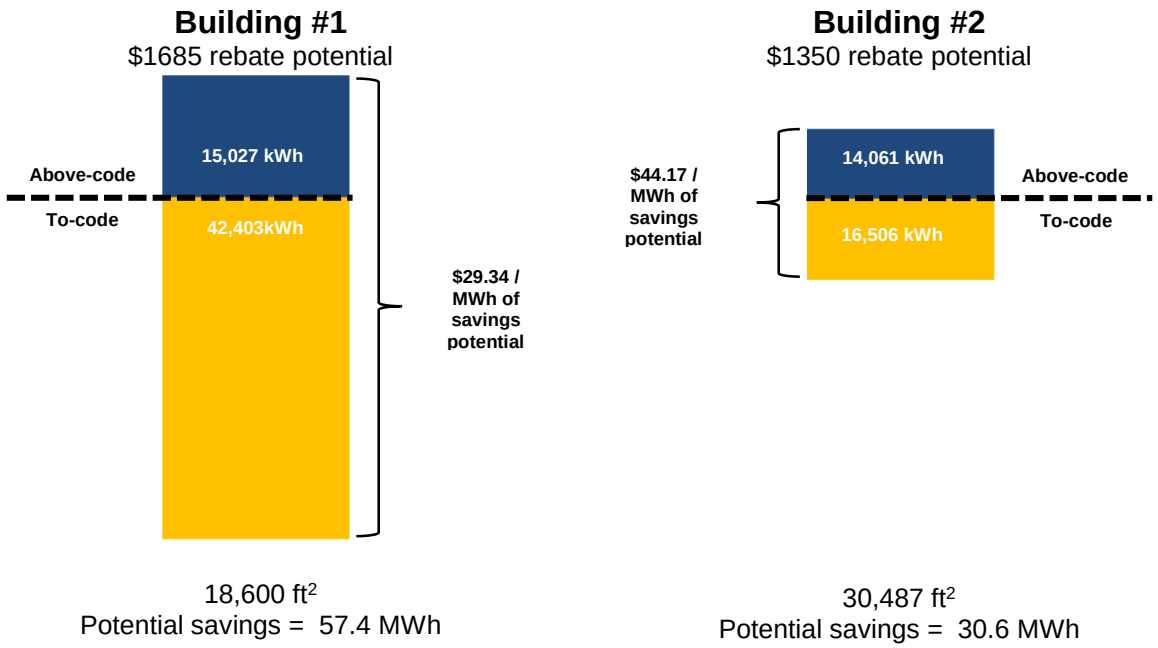
The code baseline policy has the effect of making EE program incentives amounts larger, per unit of potential energy savings basis, for buildings that already perform at or near code level. Perversely, limited incentive support is provided to address inefficient buildings.

This effect is illustrated in the figure below that shows two buildings selected from a set of 164 buildings remotely audited by building energy analytics firm FirstFuel Software, Inc. (FirstFuel).[26] These remote audits provide site-specific information related to the energy savings potential for a variety of retrofit measures. The figure shows energy savings potential identified in these two buildings at both the aggregate level and measure levels.

As shown on the figure, the savings potential above existing code are in blue, while the savings potential from upgrading a building to-code are shown in yellow. Building #1 has substantially more energy savings potential – both on a square footage and an absolute basis – than Building #2, which has a 50% larger area. Under current program rules Building #2 is eligible for a 50% larger incentive on a per MWh basis when total available savings opportunity is considered. Current policy would not allow incentives to be offered to capture additional EE savings from operational measures (including Heating, Ventilation, and Air Conditioning (HVAC) operating and maintenance measures, scheduling controls, and air side economizer maintenance). It is certainly beneficial to California if IOU programs encourage Building #2 to upgrade, but the State is missing an opportunity if the much less efficient Building #1 is not adequately encouraged to upgrade. While data for these two buildings is not representative of California's entire commercial building stock, the results illustrate the challenges associated with targeting highly inefficient buildings under current EE program rules.

[26] FirstFuel Software's remote audits have been shown to provide results comparable to on-site energy audits. Further information related to the technical validation of the FirstFuel remote audit platform is available at, http://info.firstfuel.com/technical-validation.

A comparison of incentive levels and energy savings potential in two commercial buildings in PG&E's service territory



Measure	Savings (kWh)	Incentive
Lighting Retrofit	37,230	$1,125 ($1.5 / lamp)
Parking Lot Lighting Retrofit with Controls	20,200	$560 ($70 / fixture)

Measure	Savings (kWh)	Incentive
Lighting Retrofit	30,567	$1,350 ($1.5 / lamp)

Source: PG&E analysis based on building data from FirstFuel Software, Inc. and rebate levels from PG&E (2015), *Lighting Rebate Catalog*, http://www.pge.com/includes/docs/pdfs/mybusiness/energysavingsrebates/incentivesbyindustry/lighting_catalog_final.pdf

APPENDIX C – Detail of To-Code Opportunity in Lighting

Table 1 illustrates lamp efficiency distribution by building type. The results show that warehouses, medical clinics, miscellaneous, and restaurants are still using many 4-foot T12 lamps. These are the least efficient lighting options examined and they do not perform at 2013 Title 24 levels.

Table 1 – Linear Lamp Efficiency Distribution by Business Type for PG&E – Indoor Lighting

Performance Group	Food/ Liquor	Health/ Medicinal - Clinic	Miscel-laneous	Office	Restau-rant	Retail	School	Ware-house
Base Efficiency	86%	83%	85%	94%	96%	72%	86%	41%
High Efficiency	14%	17%	15%	6%	4.4%	28%	14%	59%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
Base Efficiency Tiers Distribution								
4-foot T12	3.0%	16%	20%	6%	36%	7%	7%	21%
4-foot Other	0%	0%	0%	0%	0%	0%	0%	0%
4-foot Unknown T8	2.9%	2.0%	3.8%	4.0%	2.6%	17%	3.2%	6^
4-foot Std 700 T8	47%	50%	38%	78%	49%	25%	61%	9%
4-foot Std 800 T8	33%	14%	23%	6%	8%	23%	14%	3.9%
High Efficiency Tiers Distribution								
4-foot High Performance T8	2.2%	17%	7%	2.7%	4.4%	9%	6%	38%
4-foot Reduced Wattage T8	11%	0%	6%	2.9%	0%	14%	7%	15%
4-foot T5	0.7%	0%	1.8%	0.9%	0%	5%	1.7%	6%
4-foot LED	0.1%	0%	0.2%	0%	0%	0%	<0.1%	0%
″	**49**	**50**	**94**	**101**	**61**	**76**	**77**	**35**

* **The results presented above have been weighted by site weight.** ″'s represent the number of surveyed sites included in the analysis.

Source: Itron, Inc. (2014), *California Commercial Saturation Survey*, Table 5-16 p. 5-29, available at http://www.energydataweb.com/cpucFiles/pdaDocs/1159/California%20Commercial%20Saturation%20Study_Report_Final.pdf.

Table 2 shows that "very small" businesses are significantly lagging the overall market, with over 42% of their lighting coming from 4-foot T12s. Finally, in Table 3, within the "very small" segment, medical clinics, offices, restaurants, schools and warehouses all have a significant number of linear 4-foot T12 lamps; in the cases of very small schools and warehouses, more than 50% of lighting comes from 4-foot T12 lamps.

Table 2 – Linear Lamp Efficiency Distribution by Business Size for PG&E – Indoor Lighting

Performance Group	Large	Medium	Small	Very Small
4-foot T12	7%	0.7%	9%	42%
4-foot Other	0%	0%	0%	0%
4-foot Unknown T8	4.6%	3.0%	10%	1.5%
4-foot Std 700 T8	46%	71%	46%	34%
4-foot Std 800 T8	17%	13%	13%	9%
4-foot High Performance T8	2.6%	6%	14%	6%
4-foot Reduced Wattage T8	18%	4.8%	6%	4.1%
4-foot T5	4.5%	1.0%	1.7%	3.7%
4-foot LED	0.4%	<0.1%	0%	0%
Total	**100%**	**100%**	**100%**	**100%**
″	**39**	**198**	**180**	**126**

*** The results presented above have been weighted by site weight.** ″'s represent the number of surveyed sites included in the analysis. Large sites have annual usage over 1,750,000 kWh. Medium have greater than 300,000 kWh and less than or equal to 1,750,000. Small have max annual usage greater than 40,000 kWh and less than or equal to 300,000, and Very Small have annual usage less than or equal to 40,000 kWh.
Source: Itron, Inc. (2014), *California Commercial Saturation Survey*, Table 5-20 p. 5-34, available at http://www.energydataweb.com/cpucFiles/pdaDocs/1159/California%20Commercial%20Saturation%20Study_Report_Final.pdf.

Table 3 - Linear Lamp Efficiency Distribution by Business Type for Very Small-Sized Businesses – Indoor Lighting

Performance Group	Food/ Liquor	Health/ Medical -Clinic	Miscel-laneous	Office	Restau -rant	Retail	School	Ware-house
4-foot T12	0%	36%	16%	38%	26%	17%	68%	53%
4-foot Other	0%	0%	0.1%	<0.1%	0%	0%	0%	0%
4-foot Unknown T8	19%	1.9%	4.5%	2.8%	0.8%	3.5%	0%	0.2%
4-foot Std 700 T8	33%	19%	33%	27%	31%	20%	10%	18%
4-foot Std 800 T8	21%	18%	27%	10%	5%	24%	22%	5%
4-foot High Performance T8	27%	17%	11%	15%	33%	22%	0%	19%
4-foot Reduced Wattage T8	0%	8%	7%	7%	4.4%	5%	0%	4.2%
4-foot T5	0%	0%	2.1%	0.1%	0%	8%	0%	0.6%
4-foot LED	0%	0%	0%	0%	0%	0.1%	0%	0%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
″	**5**	**50**	**71**	**72**	**24**	**86**	**5**	**37**

*** The results presented above have been weighted by site weight.** ″'s represent the number of surveyed sites included in the analysis. Very Small sites have annual usage less than or equal to 40,000 kWh.

Source: Itron, Inc. (2014), *California Commercial Saturation Survey*, Table 5-26 p. 5-38, available at http://www.energydataweb.com/cpucFiles/pdaDocs/1159/California%20Commercial%20Saturation%20Study_Report_Final.pdf.

APPENDIX D – July 2, 2015 US EPA Letter to PG&E
(please note that original document does not contain formatting issues that were introduced when creating a text-searchable document)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D,C. 20460

JUL 2 2015

OFFICE OF
AIR AND RADIATION

Aaron Johnson
Senior Director
Pacific Gas and Electric
245 Market Street, Mail Code N9K
San Francisco, CA 94105

Dear Mr. Johnson:

In this time of potential change in California, I wanted to take this opportunity to recognize the important role that Pacific Gas and Electric (PG&E] has played in transforming the market for energy efficient products and practices in the past few decades.
Nearly 700 utilities and other energy efficiency program sponsors servicing over 87 percent of U.S. households in 50 states leverage ENERGY STAR in delivering efficiency solutions to their customers. The majority of these programs are ratepayer-funded, and run by utilities. In carrying out California's energy efficiency and market transformation mandates, PG&E and the other California Investor Owned Utilities (IOUs) have delivered exemplary ratepayer-funded efficiency programs. In fact, together the California IOUs have earned the U.S. Environmental Protection Agency's (EPA) ENERGY STAR Partner of the Year awards recognition for 12 years running.

Today, thanks in part to your efforts, ENERGY STAR is the most widely recognized symbol for energy efficiency in the world, helping families and businesses save $360 billion on utility bills, while reducing greenhouse gas emissions by 2.5 billion metric tons since 1992.

PG&E's many strengths are reflective of your unique position in the market, the infrastructure you have built, and your long track record of designing and implementing energy efficiency programs. They include:
Building strategic partnerships to tap market knowledge and increase delivery channel efficiency, accelerate market innovation, and reach a broader range of customers, In addition to working with third-parties managing a significant portfolio of programs and strategic collaborations with many local and regional governments, PG&E has created channel alliances with thousands of contractors and developed executive-level strategic agreements to expand relationships with leading national retailers.

-Effectively managing field teams making thousands of store visits each year to provide training on rebate program offerings for residential and commercial products, place point of sale materials, and educate sales staff about the benefits of energy efficiency and ENERGY STAR.

-Facilitating the benchmarking of more commercial buildings than any other utility in the country in EPA's ENERGY STAR Portfolio Manager tool, and supporting this effort with an extensive training program, web-based resources, and an extensive outreach campaign to tens of thousands of building owners.

-Continuing to build on a longstanding tradition of driving innovation and developing streamlined ENERGY STAR-focused retail channel programs that cross utility service territories and state lines, simplifying program administration, reducing participation costs for retail and manufacturer partners, and delivering a consistent message to customers about the benefits of energy efficiency.

Most recently, PG&E has assumed a critical leadership role in designing and launching the ENERGY STAR Retail Products Platform (RPP), a nationally coordinated midstream program being developed by a group of utilities with facilitation by EPA. Under the auspices of the ENERGY STAR RPP, PG&E is collaborating with EPA and other leading utilities to evolve traditional retail-based energy efficiency program design, delivery, and evaluation to reflect the changing nature of the residential products market and capture remaining, hard-to-reach energy savings. Now representing many regions of the country, the ENERGY STAR RPP builds on the structure and learnings of an innovative pilot PG&E first tested in California in 2014, and the first pilots are expected to launch in 2016.
We commend PG&E on your significant contributions to transforming the market for efficient products and practices and protecting the environment for future generations,

Sincerely,

Ann Bailey

Chief, ENERGY STAR Labeled Products Climate Protection Premierships Division