

**PUBLIC UTILITIES COMMISSION**

505 VAN NESS AVENUE  
SAN FRANCISCO, CA 94102-3298



February 14, 2012

Advice Letter 3235-G-A/3901-E-A

Brian Cherry  
Vice President, Regulatory Relations  
Pacific Gas and Electric Company  
77 Beale Street, Mail Code B10B  
P.O. Box 770000  
San Francisco, CA 94177

Subject: PG&E's Advice Letter 3235-G-A/3901-E-A

Dear Mr. Cherry:

Energy Division staff have determined that PG&E Advice Letter 3235-G-A/3901-E-A (January 13, 2012) is in compliance with D. 09-09-047 and the December 22, 2011 Assigned Commissioners Ruling (ACR) Clarifying Fund Shifting Rules and Reporting Requirements. The supplemental advice letter filing provided additional clarification and corrections to Advice Letter 3235-G-A/3901-E filed on September 12, 2011. The effective date of this approval is February 10, 2012.

PG&E filed Advice Letter (AL) 3235-G/3901-E on September 12, 2011 to request authority to: (1) implement fund shifting between energy efficiency programs within PG&E's approved 2012-2012 portfolio that goes beyond the pre-authorized fund shifting levels; and (2) make other program modifications, including one measure-level incentive adjustment and one program closure. In total, PG&E requested authority to shift some \$35 million in program funds.

The Utility Reform Network (TURN) filed a protest to AL 3235-G/3901-E on October 3, 2011. The California Energy Efficiency Industry Council and the Natural Resources Defense Council filed responses to the AL, also on October 3<sup>rd</sup>. PG&E responded to TURN's protest on October 10, 2011. Energy Division suspended the AL on October 11, and subsequently filed a request for Supplemental Information on December 23, 2011. PG&E filed its response in a Supplemental Advice Filing 3235-G-A/3901-E-A on January 13, 2012.

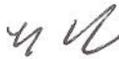
An "Assigned Commissioners Ruling (ACR) Clarifying Fund Shifting Rules and Reporting Requirements" was issued on December 22, 2011 further clarifying fund shifting rules governing PG&E's Supplemental Advice Letter filed January 13, 2012. Energy Division has confirmed that PG&E complied with these updated fund shifting rules in Advice Letter 3235-G-A/3901-E (January 13, 2012). PG&E supplemental advice letter addressed additional questions from Energy Division.

Brian Cherry  
February 14, 2012  
Page 2

Attachment 1 contains a technical review and analysis of how Energy Division staff determined that the supplemental advice letter complies with D. 09-09-047 and the December 22, 2011 ACR, and resolves the TURN protests.

Please contact Cathy Fogel of the Energy Division staff at 415-703-1809 ([cfl@cpuc.ca.gov](mailto:cfl@cpuc.ca.gov)) if you have any questions.

Sincerely,



Edward Randolph  
Director, Energy Division

cc: Service List R. 09-11-014  
Marybelle C. Ang, TURN staff attorney  
Audrey Chang, Executive Director, CEEIC  
Noah Horowitz, Director, CEES, NRDC  
Simon Baker, Energy Division  
Hazlyn Fortune, Energy Division

## Attachment 1

### Technical Review and Analysis

#### I. Background:

PG&E AL 3235-G/3901-E requested approval of program changes in two areas: 1) Shifting Funds to Optimize Portfolio Performance; and 2) Implementation of Other Program Design Modifications. PG&E stated that the requests under area one were intended to promote generation of additional energy savings, improve the overall portfolio cost-effectiveness, and support high demand programs and market sectors. PG&E's request in area two included one measure-level incentive level change and one program closure. PG&E stated that implementation of the fund shifts and other modifications would achieve a total resource cost of 1.31 for the portfolio.

In AL 3235-G/3901-E, PG&E indicated fund shifting requests in the areas of: statewide residential energy efficiency (\$14.5 million); statewide commercial energy efficiency (\$19.1 million); new construction/Zero Net Energy Pilot Program (\$5.9 million); Demand Side Management (DSM) Coordination and Integration Program (\$1 million); non-statewide programs (\$13.5 million); Codes and Standards program (\$1.35 million); and, the Emerging Technologies Program (\$12.6 million). In the program design modification area, PG&E requested authority to revise rebate levels in the Residential Advanced Consumer Lighting Subprogram for various LED lighting products. It also requested authorization to close the Cool Control Plus Third-Party Program effective October 2011.

Ordering Paragraph 43(b) of D. 09-09-047 requires the investor owned utilities (IOUs) to file an advice letter for shifts of funds of more than 15% per annum within and between any of the twelve statewide energy efficiency programs, third party programs, or government programs for the entire portfolio cycle. It thus requires an advice letter filing for fund shifting within and between 14 categories of programs. The decision was silent, however, on the applicability of the 15% fund shifting rule to local utility, on-bill and other financing programs.

D. 09-09-047 summarizes fund shifting rules in the Energy Efficiency Policy Manual pertaining to statewide Emerging Technologies, Marketing, Education and Outreach, and Codes and Standards. As stated in D. 09-09-047, the Energy Efficiency Policy Manual and again in the December 22, 2011 Fund Shifting Assigned Commissioner Ruling, an advice letter is required for shifts that would reduce any of these programs by more than 1% of budgeted levels.

The December 22, 2011 Assigned Commissioners Ruling (ACR) Clarifying Fund Shifting Rules and Reporting Requirements addressed the lack of clarity regarding fund shifting rules for local, on-bill and other programs. To address this omission the ACR created a fifteenth category called to which the 15% fund shifting rules would also apply. It stated that this "Other EE Programs" category includes local programs, financing programs, and any other programs not otherwise categorized. It then clearly defined the "third party" program category as including any third-party programs that are competitively bid and count towards the 20% competitive requirement. It defined

“Government Programs” as including local government partnerships and state / institutional government partnerships.<sup>1</sup>

The December 22, 2012 ACR also restated that no program or subprogram shall be eliminated except through the advice letter process. In addition, it stated that “changes to incentive levels or modifications to program design (such as changes to customer eligibility requirements) will not trigger Energy Division or formal Commission review. Program administrators will notify the Commission of all incentive level changes that take place through the Program Implementation Plan Addendum process.”<sup>2</sup>

With this clarified guidance, PG&E filed advice letter PG&E AL 3235-G-A/3901-E-A to reflect these updated fund shifting and other rules and to respond to Energy Division questions on the AL issued on December 23, 2011. PG&E had previously responded to TURN’s October 3, 2011 protest letter in a reply filed on October 10, 2011.

PG&E AL 3235-G-A/3901-E-A requested fund-shifting authority for PG&E’s Residential, Third Party, Government Partnerships, “Other” EE Programs, and Emerging Technologies Program (ETP). The supplemental advice filing provided additional clarification and corrections to Advice 3235-G/3901-E. Table 1 Summarizes PG&E’s fund shifting request, as contained in Attachment A to AL 3235-G-A/3901-E-A.

*Energy Division has reviewed PG&E’s fund shifting request as summarized in Table 1 and concurs that it complies with adopted fund shifting rules.*

---

<sup>1</sup> “Assigned Commissioners Ruling (ACR) Clarifying Fund Shifting Rules and Reporting Requirements” (December 22, 2011), Attachment A at 2.

<sup>2</sup> Assigned Commissioners Ruling (ACR) Clarifying Fund Shifting Rules and Reporting Requirements (December 22, 2011), Attachment A at 2.

**Table 1: PG&E Fund Shifting Request, Supplemental AL 3235-G-A/3901-E-A**

Program #	Main Program Name / Sub-Programs	2010-12 Authorized Budget (Compliance AL 3065-G-A&B/3562-E-A&B)	2010-12 Rebalanced Budget (AL 3235-G-3901-E)	Budget Shifts	% Annual Change in Fund Shift by Category [2]	Advice Filing Triggered
<b>1. Residential Programs</b>						
PGE2100	Home Energy Efficiency Surveys Program	\$21,018,892	\$23,618,892	\$2,600,000		
PGE2100	Residential Lighting Incentive Program for Basic CFLs	\$30,000,231	\$29,000,231	(\$1,000,000)		
PGE2100	Advanced Consumer Lighting Program	\$33,342,987	\$33,142,987	(\$200,000)		
PGE2100	Home Energy Efficiency Rebates	\$71,719,478	\$66,133,504	(\$2,000,000)		
PGE2100	Appliance Recycling Program	\$20,241,876	\$13,961,376	(\$1,000,000)		
PGE2100	Business and Consumer Electronics Program	\$31,006,237	\$31,006,237	\$0		
PGE2100	Multifamily Energy Efficiency Rebates Program	\$20,856,887	\$19,514,043	(\$300,000)		
PGE2100	Whole House Performance Program	\$46,000,035	\$29,700,022	(\$12,500,000)		
	<b>TOTAL RESIDENTIAL PROGRAMS</b>	<b>\$274,186,622</b>	<b>\$246,077,292</b>	<b>(\$14,400,000)</b>	<b>-16%</b>	<b>Yes</b>
<b>9. Emerging Technologies</b>						
PGE2108	Assessments	\$19,106,905	\$14,072,326	(\$5,034,579)		
PGE2108	Scaled Field Placement	\$3,606,389	\$974,675	(\$2,631,714)		
PGE2108	Demonstration / Showcasing	\$3,653,659	\$1,546,620	(\$2,107,039)		
PGE2108	Market and Behavioral Studies	\$2,807,096	\$1,175,743	(\$1,631,353)		
PGE2108	Technology Supply Side Efforts	\$1,066,782	\$548,199	(\$518,583)		
PGE2108	Incubation	\$959,035	\$282,314	(\$676,720)		
	<b>TOTAL EMERGING TECHNOLOGIES PROGRAM</b>	<b>\$31,199,866</b>	<b>\$18,599,878</b>	<b>(\$12,599,989)</b>	<b>121%</b>	<b>Yes</b>
<b>12. DSM Coordination &amp; Integration</b>						
PGE2111	Statewide DSM Coordination & Integration	\$1,200,000	\$1,070,815	(\$129,185)		
	<b>TOTAL DSM COORDINATION &amp; INTEGRATION</b>	<b>\$1,200,000</b>	<b>\$1,070,815</b>	<b>(\$129,185)</b>	<b>-32%</b>	<b>Yes</b>
<b>13. Government Partnerships</b>						
PGE2126	Institutional/Statewide Government Partnerships	\$38,839,695	\$57,666,146	\$14,000,000		
Various	Local Government Partnership Programs	\$103,585,824	\$110,630,649	\$4,750,000		
	<b>TOTAL GOVERNMENT PARTNERSHIPS</b>	<b>\$142,425,519</b>	<b>\$168,296,795</b>	<b>\$18,750,000</b>	<b>39%</b>	<b>Yes</b>
<b>14. Third Party Programs</b>						
	<b>TOTAL THIRD PARTY PROGRAMS</b>	<b>\$289,979,191</b>	<b>\$320,785,343</b>	<b>\$16,307,193</b>	<b>17%</b>	<b>Yes</b>
<b>15. Other Programs</b>						
PGE2125	Innovator Pilots Program	\$8,826,248	\$7,464,935	(\$920,000)		
PGE2125	Green Communities	\$20,975,784	\$15,646,995	(\$4,280,000)		
PGE2112	Zero Net Energy Pilots (excluding EM&V)	\$12,250,007	\$5,698,239	(\$5,857,204)		
PGE2114	On-Bill Financing (Includes Loan Pool Amount)	\$27,844,983	\$27,844,983	\$0		
<b>Integrated DSM</b>						
PGE2113	Integrated Marketing	\$3,500,000	\$3,413,840	(\$86,160)		
PGE2113	Integrated Education & Training	\$300,000	\$215,770	(\$84,230)		
PGE2113	Integrated Sales Training	\$1,500,000	\$1,213,775	(\$286,225)		
PGE2113	Integration Support	\$2,000,000	\$1,585,801	(\$414,199)		
	<b>TOTAL LOCAL PROGRAMS</b>	<b>\$77,197,021</b>	<b>\$63,084,338</b>	<b>(\$11,928,019)</b>	<b>-46%</b>	<b>Yes</b>
	<b>GRAND TOTAL</b>	<b>\$1,338,000,000</b>	<b>\$1,338,000,000</b>	<b>\$0</b>	<b>0%</b>	

**II. Party Protests and Responses, and PG&E Replies**

This section reviews party protests and responses to PG&E's AL PG&E AL 3235-G/3901-E. Energy Division received no protests or responses to PG&E AL 3235-G-A/3901-E-A.

- **NRDC and CEEIC response regarding proposed fund shifts out of Codes and Standards programs.**

Both the California Energy Efficiency Industry Council (CEEIC) and the Natural Resources Defense Council (NRDC) filed response letters to PG&E's AL 3235-G/3901-E on October, 3, 2011. Both letters responded to PG&E's AL by indicating the importance of codes and standards (C&S) programs in achieving adopted energy efficiency (EE) goals. CEEIC pointed out in particular that Energy Division's 2010-2012 Energy Efficiency EM&V Plan indicated that the investor owned utilities C&S programs were responsible for producing 14.5% of statewide EE savings.<sup>3</sup>

In response to these comments, PG&E subsequently stated in its October 10, 2011 letter that it would withdraw its request to shift \$1.35 million out of its C&S Program and adjust the requested increase to third party programs by the same amount.<sup>4</sup> In its Supplemental Advice Filing 3235-G-A/3901-E-(January 13, 2012), PG&E did not request authority for fund shifting out of its C&S programs.

*Energy Division confirms that PG&E's revised Supplemental Advice Filing 3235-G-A/3901-E-(January 13, 2012) maintains C&S program budgets as originally authorized in D. 09-09-047.*

- **The Utility Reform Network (TURN) filed a protest to AL 3235-G/3901-E on October 3, 2011. TURN requested that PG&E show how its request to shift funds away from certain programs approved in D. 09-09-047, such as PG&E's Energy Upgrade California<sup>5</sup> program, is in compliance with D. 09-09-047.**

In its letter, TURN protested PG&E's proposed reduction of the statewide residential energy efficiency program budget by \$14.5 million, noting that in doing so PG&E would reduce its target for homes to treat under its Energy Upgrade California (EUC) program from 15,500 to 6,000 homes. In its October 10, 2011 response, PG&E stated that it had a robust EUC program, but that the original statewide target for the number of homes to be treated by the EUC on a statewide basis represented a "high level walk down" equal to 1% of California's 13 million homes. PG&E implied, but did not state, that the originally approved and budgeted targets for the EUC program were unrealistically high.

On May 24, 2011, PG&E provided Energy Division with an analysis of low, medium and high homeowner participation scenarios for the Energy Upgrade California program in its service territory in response to a data request. Having reviewed these scenarios, Energy Division confirms that PG&E's requested \$12,000 budget decrease in its whole house Energy Upgrade California program to \$30 million for the 2010-2012 period is highly likely to leave sufficient program funds to reach at least 7,000 homes total for the 2010-2012 period, based on PG&E's submitted "medium" and "high" 2012 participation scenarios. Since PG&E achieved approximately 1,500 jobs in 2011, the first year of the operation of PG&E's full EUC program (PG&E operated a EUC pilot program in 2009-2010), a nearly fourfold increase in participation rates in 2012 alone strikes Energy Division staff as a reasonable as well as achievable growth

---

<sup>3</sup> Response to PG&E Advice Letter 325-G/3901-E "Request for Authority to Shift Funds and Make Other Program Modifications Pursuant to D. 09-09-047 and D. 11-07-030." California Energy Efficiency Industry Council, October 2, 2011.

<sup>4</sup> PG&E's Protest Reply on The Utility Reform Network's (TURN) Protest of PG&E's Advice 3235-G/3901-E and Comments from Natural Resources Defense Council and California Energy Efficiency Industry Council, PG&E, October 20, 2011, p. 1.

<sup>5</sup> Incorrectly called the "California Energy Upgrade" program in TURN's protest letter.

rate. Should PG&E verge on expending the rebalanced EUC budget before the end of 2012, Energy Division would expect PG&E to replenish funds to meet incentive demands at that time.

- **In its protest letter, TURN requested that PG&E provide the budget expenditures to date for each program and subprogram, and provide results of its analysis and breakdown of the energy savings, demand reduction, and cost-effectiveness based on the adopted changes to ex-ante savings per D. 11-07-030 for each subprogram, with and without fund-shifting.**

PG&E responded to TURN's concerns by providing in its October 10, 2011 Protest Reply two attachments that summarize the budget shifts between programs.<sup>6</sup> Attachment 1 indicates the approved budget, the proposed rebalanced budget, the overall fund shift/program, and the percentage budget change by program. Attachment 2 indicates forecast program and subprogram Total Resource Cost (TRC), and energy, demand and therm savings values with the: (1) approved budget; (2) implementation of updated ex-ante savings values as per D. 11-07-030; and (3), with updated ex-ante values and the proposed budget rebalancing. Subsequently, Attachment 1 to Advice Letter 3235-G-A/3901-E-A indicated the proposed program and subprogram budget shifts following program categorization guidance indicated in the December 12, 2011 Fund Shifting ACR.

*Energy Division has reviewed these attachments and believes that they demonstrate credible analysis performed by PG&E to develop the proposed fund shift requests. Energy Division also believes that this analysis provides sufficient information on the specific programs and subprograms impacted as requested by TURN.*

- **TURN asked that PG&E confirm that none of the net shift of \$19 million for the Commercial EE program proposed in AL 3235-G/3901-E will be spent on commercial basic CFLs and linear fluorescents.**

In its October 10, 2011 reply to TURN's protest, PG&E confirmed that fund shifts with its statewide Commercial Program will not result in any additional incentives for basic CFLs, but that linear fluorescents remain an important energy use reduction opportunity and will remain part of the product mix delivered by PG&E's Statewide Commercial programs.

*Energy Division accepts this explanation as reasonable.*

- **TURN asked PG&E to explain its conclusion that the current LED light produce incentives are too low, and that the proposed incentives are appropriate to increase participation, specifically requesting reconciliation of PG&E's proposed LED incentives of \$15 given recent news regarding LED pricing.**

In Advice Letter 3235-G/3901-E (September 12, 2011), PG&E sought authorization to revise rebate levels in its Residential Advanced Consumer Lighting Subprogram for

---

<sup>6</sup> PG&E's Protest Reply on The Utility Reform Network's (TURN) Protest of PG&E's Advice 3235-G/3901-E and Comments from Natural Resources Defense Council and California Energy Efficiency Industry Council, PG&E, October 20, 2011, pgs. 8-11.

various LED light products. Specifically, PG&E requested authority to increase the incentive level “to ‘up to \$15’ for all LED products, including screw-in any hardwired bulbs. All other normal incentive levels within Advanced Consumer Lighting program would remain unchanged.”<sup>7</sup>

In its Supplemental Advice Letter 3235-G-A/3901-E-A (January 13, 2012), PG&E clarified that the initial products targeted for this incentive change are ENERGY STAR® approved PAR and MR-16 lamps as well as recessed downlight retrofit kits. PG&E also indicated that it would develop additional work papers for LED products at the time that a significant number of offerings within a product category (e.g. Globe) become ENERGY STAR® certified<sup>8</sup>.

In additional information provided in its supplemental advice letter, PG&E made a case for the proposed incentive levels for these identified products being: (1) reasonable based on studies summarized in the filing; and, (2) reasonable based on the practices of other utilities in the United States. The Supplemental filing also addressed TURNs concern that PG&E might incent at the \$15 level LED lamps already priced at \$15 each by providing information on the price levels of the ENERGY STAR® products would be targeted for the incentive increase. PG&E stated that the lamps identified by TURN in its protest are not ENERGY STAR® certified, considered of an inferior quality, and are not proposed by PG&E to receive the higher rebate level.

*After carefully reviewing the information provided, Energy Division agrees that PG&E’s request to increase the incentive level to “up to \$15” for ENERGY STAR® approved PAR and MR-16 lamps, and recessed downlight retrofit kits is reasonable. Energy Division also agrees that PG&E’s request to identify additional LED products that may be appropriate for the increased incentive levels as they become ENERGY STAR® certified is reasonable.*

### **III. Additional Requests**

As noted in Section I above, in Advice Letter 3235-G/3901-E (September 12, 2011) PG&E requested authority for program modifications including: 1) measure level incentive changes for LED bulbs; and, 2) authority to eliminate one third party program (the Cool Control Plus Third Party program).

*Energy Division agreed in Section II above that the measure level incentive changes (LEDs) requested by PG&E are reasonable. Energy Division received no protests regarding PG&E’s request for authority to end the Cool Control Plus Third Party program, noted that PG&E stated that Honeywell Cool Control requested this program closure, and therefore agrees that terminating this program is reasonable, effective October 2011.*

---

<sup>7</sup> Advice 3235-G/3901-E, “Request for Authority to Shift Funds and Make Other Program Modifications Pursuant to D. 09-09-047 and D. 11-17-030,” PG&E, September 12, 2011, pg. 7.

<sup>8</sup> Advice 3235-G-A/3901-E-A. “Supplemental Filing: Request for Authority to Shift Funds and Make Other Program Modifications Pursuant to D. 09-09-047 and D. 11-07-030,” PG&E, January 13, 2012, pg. 8.



January 13, 2012

**Advice 3235-G-A/3901-E-A**

(Pacific Gas and Electric Company ID U 39 M)

Public Utilities Commission of the State of California

**Subject: Supplemental Filing: Request for Authority to Shift Funds and  
Make Other Program Modifications Pursuant to D.09-09-047 and  
D.11-07-030**

This supplemental advice filing provides additional clarification and corrections to Advice 3235-G/3901-E and is filed pursuant to California Public Utilities Commission (“CPUC” or “Commission”) Energy Division “Notification of Need for Supplemental Advice Letter for PG&E 3235-G/3901-E” dated December 23, 2011.

**Background**

Advice 3235-G/3901-E, filed in compliance with Decision (“D.”) 09-09-047 and D.11-07-030 on September 12, 2011, requested authority to shift funds between Energy Efficiency (“EE”) programs within PG&E’s approved 2010-2012 portfolio beyond the pre-authorized fund shifting levels; and to make other program modifications, including one measure-level incentive adjustment and one program closure.

On October 3, 2011, The Utility Reform Network (“TURN”) submitted a protest, and the Natural Resources Defense Council (“NRDC”) and California Energy Efficiency Industry Council (“Efficiency Council”) submitted comments to PG&E’s advice letter. PG&E provided a timely response on October 10, 2011.

The advice letter was suspended on October 11, 2011, to provide more time for Energy Division staff to review. On December 23, 2011, Energy Division issued a memo requesting that PG&E file a supplemental advice letter by January 13, 2012, to provide clarification to several areas addressed in its initial request.

On December 22, 2011, the CPUC issued Assigned Commissioner Mark J. Ferron's Ruling Clarifying Fund Shifting Rules and Reporting Requirements (“Fund Shifting ACR”) that updated the Energy Efficiency Policy Manual to reflect the fund

shifting rules adopted in D.09-09-047, and clarified the fund shifting categories for Statewide, Third Party, Government Partnerships and all other EE programs.

This supplemental advice letter is responsive to Energy Division's request for additional information. This supplemental advice letter also aligns PG&E's rebalanced portfolio budget with the revised fund shifting rules shown in Attachment A of the Fund Shifting ACR.

### **Rebalanced Budget Request By Fund Shifting Category**

In Advice 3235-G/3901-E, PG&E requested authorization to shift more 2010-2012 EE funds to the Third Party and Government Partnership Programs, and to the Statewide Commercial Program, to offset the impact of new ex ante savings values and assure continued funding for successful programs. As shown in Attachment 1 hereto, the funds are being shifted from Residential, Industrial, Emerging Technologies, Statewide Demand Side Management ("DSM") Coordination and Integration and Other Programs (Innovator Pilots, Green Communities, Zero Net Energy ("ZNE") Pilots and Local DSM Coordination and Integration). These programs are forecasted to come in under budget or to operate with a reduced program budget over the remaining period of the 2010-2012 portfolio cycle. These funds are being shifted into programs with higher-than-expected market demand.

In Advice 3235-G/3901-E, PG&E proposed to reduce its Codes and Standards Program by \$1.35 million. However, PG&E is withdrawing that request through this supplemental advice letter consistent with its response to comments from NRDC and the Efficiency Council.<sup>1</sup> Instead, PG&E has lowered its requested increase to Third Party Programs by the same amount. Attachment 1 hereto reflects this change.

Under the 15% fund shifting rule as clarified by the Fund-Shifting ACR and as shown in Attachment 1 hereto, PG&E's fund-shifting request for the Residential, Third Party, Government Partnerships and Other EE Programs requires an advice letter.<sup>2</sup> Under the 1% rule, PG&E's fund-shifting request for its Emerging

---

<sup>1</sup> See *PG&E's Protest Reply on The Utility Reform Network's (TURN) Protest of PG&E's Advice 3235-G/3901-E and Comments from Natural Resources Defense Council and California Energy Efficiency Industry Council*, October 10, 2011, p. 1.

<sup>2</sup> See Fund-Shifting ACR, Attachment A: "The 15% fund-shifting rule, requiring an Advice Letter if the amount transferred from this category is greater than 15% in either direction, is applied to the category funding level in the authorized budget adopted in the compliance filing pursuant to the most recent authorizing decision (or the decision itself, if there is no compliance filing)."

Technology Program (“ETP”) also requires an advice letter.<sup>3</sup> The other fund shifts shown in Attachment 1 to this advice letter do not require formal Commission review or approval.

### **Responses to Energy Division’s Questions**

The following section provides PG&E’s responses to the Energy Division’s December 23, 2011, Notification of Need for Supplemental Advice Letter for PG&E 3235-G/3901-E.

Please note that Questions 3.e and 4.b, respectively, request Government Partnership and Third Party Program information that is business sensitive and will not be finalized until this advice letter is approved and contracts are revised with affected parties. Instead of filing a confidential attachment to the supplemental advice letter, PG&E will provide its proposed budget changes for Third Party and Government Partnership Programs to Energy Division under the confidentiality provisions of Public Utilities Code Section 583 and General Order (“GO”) 66-C, concurrent with this advice filing.

#### **1. Residential Energy Efficiency Program**

Question 1.a	Explain why \$2.6M in new HEES funding is needed when less than 50% of that budget had been spent by August 2011. Describe the additional activities to be undertaken with the additional funds for the HEES program
Response 1.a	PG&E previously understood D.09-09-047 to direct the IOUs to not include in-house “audits” as part of HEES. <sup>4</sup> However, ED later clarified that the IOUs would be permitted to offer in-house “surveys” as long as they were limited in scope and did not interfere with the more extensive diagnostic audits required for Whole House Programs as part of Energy Upgrade California. We are therefore requesting additional budget to support these activities. In addition, we are implementing a more robust and comprehensive progressive energy audit tool (“PEAT”) product suite for our residential customers than initially envisioned. These expansions to the program offering include behavioral science methods (such as home energy reports) which were not previously included in the HEES program implementation plan (“PIP”). Further,

<sup>3</sup> See Fund-Shifting ACR, Attachment A: “Advice Letter required for shifts that would reduce any of these program by more than 1% of budgeted levels.”

<sup>4</sup> D. 09-09-047, p. 120 and noted on page 26 of PG&E’s Residential PIP.

	customer web tools were launched mid-cycle and most of the expenditures related to the development and maintenance of those tools were not incurred before August 2011. Given the mid-cycle additions and that the majority of program costs did not occur as of August 2011, PG&E will see program costs increasing in the latter part of 2011 and 2012.
Question 1.b	Provide additional discussion of the rationale for the residential program cuts.
Response 1.b	The Residential Program fund shift request reflects adjustments based on market conditions as well as both year-to-date and forecasted program activity. With the exception of the Whole House Performance Program, the request for a net \$1.9M shift out of Residential Programs from an original budget of \$218M equates to 0.8% of the total Residential budget. As discussed in PG&E's response to TURN's protest (at p. 3), the Whole House Performance budget reduction reflects current market conditions and realistically achievable targets through the end of 2012.

## 2. New Construction Program/Zero Net Energy Pilot Program<sup>5</sup>

Question 2	Either provide or provide a date in the month of January 2012 for the provision to all the parties served the original AL of updated/revised quantitative programmatic targets for the ZNE Net Energy Pilot Program. Indicate a date by when a revised ZNE PIP to reflect the proposed cuts will be provided to Energy Division for review and posting on EEGA.
Response 2	Attachment 2 hereto PG&E provides its revised quantitative programmatic targets (or "Program Performance Metric ("PPM") elements") for PG&E's ZNE Pilot Program at the funding level requested in this AL. To accommodate the reduced budget, PG&E proposes to reduce its effort in some areas, while preserving the unique elements of the program. Once the AL is approved, Attachment 2 will be posted on EEGA as an Addendum to the ZNE Program Implementation Plan ("PIP").

---

<sup>5</sup> Based on the Fund-Shifting ACR, the Zero Net Energy ("ZNE") Pilot Program is part of the Other Programs fund-shifting category, not the New Construction Program.

3. Non-Statewide Programs<sup>6</sup>

Question 3.a	Describe what money was unspent and why within the Innovator Pilots and Green Communities Pilot Programs.
Response 3.a	<p>Innovator Pilots: PG&amp;E originally proposed funding for seven projects. In working with ED, the program’s budget was authorized for a higher amount of \$8.8M in order to allow for a second solicitation. Nine additional projects were selected in July 2011 as a result of the second solicitation. However, because the proposed budgets for these new projects were generally lower than those of the first solicitation, PG&amp;E estimates the program has approximately \$1.4M more than what is required to fully fund the 16 selected projects.</p> <p>In addition, contracts have been signed for only four of the nine new projects, and it is possible that one or more selected participants will choose to drop out of the program for a variety of reasons ranging from waning local government support for the original proposal to concerns about ability to manage the data required for the proposed projects. Due to potential project withdrawals and the lower costs of the second set of projects, it is unlikely that all of the \$7.5M budget will be expended by the end of the 2012.</p> <p>Green Communities: As this pilot program has been rolled out to local governments, PG&amp;E has learned that many local governments in northern California have already completed greenhouse gas (“GHG”) inventories, and several have already completed climate action plans (“CAPs”). Given that the original budget for the local government climate planning program exceeds the three-year demand for these services, a portion of those funds can be moved to other programs.</p> <p>PG&amp;E has provided climate planning services to approximately one-third of our local governments who have not yet completed GHG inventories or CAPs and is continuing to reach out to additional local governments. We have provided data to approximately 80 percent of our local governments to date, and are on track to provide data to</p>

---

<sup>6</sup> Based on the Fund-Shifting ACR, the Non-Statewide Programs are part of the Other Programs fund-shifting category.

	<p>100% by the end of 2012.</p> <p>PG&amp;E has only expended approximately one-third of the original budget to complete the work described above, as well as the Statewide Energy Efficiency Collaborative program, fluorescent lamp recycling efforts, and climate planning strategic support. With the proposed \$4.3M budget reduction, PG&amp;E expects that the remaining funds will meet the needs for the remainder of the 2010-2012 program cycle.</p>
Question 3.b	Describe how the proposed cut will impact IDSM goals and objectives regarding implementation of IDSM pilot programs.
Response 3.b	PG&E does not anticipate any negative impact towards IDSM efforts as a result of the requested fund shifts for its pilot programs.
Question 3.c	An explanation regarding whether any local governments that have requested Green Communities program support would not now get this support due to the proposed \$4.3M cut.
Response 3.c	The proposed cut will not end support for any local governments currently receiving support through the Green Communities program. Additionally, PG&E continues to reach out to local governments in an effort to expand the programs participants.
Question 3.d	Please explain the breakdown of the proposed increased funding for Government programs, between the subprograms of Institutional/Statewide Government Programs (ex-ante rebalanced TRC of .59) and Local Government Programs (ex-ante rebalanced TRC of 1.38).
Response 3.d	<p>PG&amp;E is requesting a total budget increase of \$18.75M for its Government Partnership Program - a \$14M increase for its Institutional/Statewide Government Partnerships and a \$4.75M increase to its Local Government Partnership Program. Significant interest in statewide and local government partnership programs has created an existing pipeline of energy efficiency projects that exceeds the current three-year budget. The proposed budget increase will pay for incentives for these additional projects as well as the associated project management costs.</p> <p>The increased funding will be distributed between the following Government Partnership programs:</p> <p>Institutional/Statewide Government Partnerships</p> <p>PGE21261 California Community Colleges</p>

	<p>PGE21262 University of California/California State University</p> <p>PGE21263 State of California</p> <p>PGE21264 Department of Corrections and Rehabilitation</p> <p>Local Government Partnerships</p> <p>PGE2132 East Bay Energy Watch</p> <p>PGE2147 San Francisco Energy Watch</p> <p>In addition, funding will be provided to various Local Government Partnerships to continue PG&amp;E's Moderate Income Direct Install (MIDI) program in 2012.</p> <p>See response to Question 3.e regarding a more detailed budget breakout.</p>
Question 3.e	Please provide list of all subprograms with proposed budget changes (LG and Institutional/State) within the Government Program (non-Statewide) program category, and provide a short justification for the proposed budget changes.
Response 3.e	PG&E will provide this business-sensitive customer information to Energy Division in a separate confidential response as discussed above. See also Response 3.d, above.

#### 4. Commercial Energy Efficiency Program

Question 4.a	Explain why PG&E proposes cutting the Industrial program budget by \$2M, (with ex-ante rebalanced TRC of 3.34), while proposing increasing Third Party funding (overall TRC of 1.62) by \$18M.
Response 4.a	<p>The reduction of \$2M for the Industrial Program budget is a marginal adjustment allowed by a lower cost of saving acquisition than initially forecasted and by the prudent deployment of Continuous Energy Improvement ("CEI"). This change leads to lower expenses than originally planned.</p> <p>PG&amp;E is proposing to shift funds to Third Party Programs that are the most cost effective or that serve key niche market segments that have higher than originally expected demand, such as small and medium businesses ("SMB"), schools and agriculture.</p>
Question 4.b	Are only some 3P programs targeted for funding increase? If so, please name which ones, and provide a brief rationale.

Response 4.b	Yes, PG&E is targeting a total increase of \$16.3M to its Third Party Program. This is \$1.35M less than proposed in AL 3235-G/3901-E, due to PG&E withdrawing its request to shift \$1.35M out of Codes and Standards, as discussed above. PG&E will provide this business sensitive customer information to Energy Division in a separate confidential response as discussed above. See also Response 4.a, above.
--------------	---

#### 5. LED Incentive Changes

Question 5.a	What are the initial products PG&E plans to support?
Response 5.a	PG&E plans to initially support ENERGY STAR approved PAR and MR-16 lamps as well as recessed downlight retrofit kits.
Question 5.b	How will PG&E determine which products they will support beyond the initial products?
Response 5.b	PG&E plans to develop additional workpapers for LED products as a significant number of offerings within a category (e.g., Globe) become ENERGY STAR certified. In addition to product quality, workpaper development will also be prioritized based on energy savings potential.
Question 5.c	What are the approximate retail prices of the products PG&E plans to support?
Response 5.c	See Attachment 3 hereto (LED Product Pricing). The methodology for this document is to pull pricing information for ENERGY STAR approved products from leading retailers (e.g., Home Depot, Lowes) and distributors (e.g., Grainger, Platt, Polar Ray) and average the values for the LED products for which PG&E has recently submitted workpapers (LED PAR38, PAR30, PAR20, and MR-16) or has workpapers approved (LED recessed downlights). This method indicates average costs ranging from \$59.17 (recessed downlights) to \$23.23 (MR-16). The requested incentive level increase of up to \$15 is to allow flexibility to provide higher incentives for higher priced LED products such as recessed downlights, PAR38 and PAR30 lamps.
Question 5.d	Can PG&E supply the results of the pricing test with Costco that is reference in the response to TURN?
Response 5.d	The results were presented to the Energy Division during a recent monthly Statewide Residential Lighting Program call. Briefly, the market tests showed that incentives significantly improve sales. A summary of the incentive test results can be

	found here: <a href="http://www.energystar.gov/ia/partners/downloads/meetings/2011/Residential%20Lighting-%20Toward%20a%20Portfolio%20Approach.pdf?da0a-0d23">http://www.energystar.gov/ia/partners/downloads/meetings/2011/Residential%20Lighting-%20Toward%20a%20Portfolio%20Approach.pdf?da0a-0d23</a>
Question 5.e	Can PG&E supply the results of their benchmarking of other utilities' incentive offerings
Response 5.e	See Attachment 4 hereto (LED Incentive Benchmarking) demonstrating incentive levels from other utility programs from around the country. Rebates offered by other utilities can be as high as \$40 for certain LED products.

#### 6. DSM Coordination and Integration Program<sup>7</sup>

Question 6.a	Energy Division staff are not aware of who PG&E discussed the proposed IDSM budget cut rationale with. Please provide greater detail regarding the rationale for the proposed IDSM budget cut including added line item amounts requested to be transferred from specific sub-buckets under item #12 of Attachment A. (Note that SDG&E has requested additional funds for the IDSM program, which would seem to be contradictory to the explanation for the IDSM budget cut that PG&E has provided).
Response 6.a	PG&E originally requested and received authorization to fund both Statewide and Local Integration efforts in D.09-09-047 (funding of the local program for integrated marketing, internal and external training were funded through the EE, DR and LIEE portfolios). With two years of the portfolio completed, PG&E is in a better position to determine what funds are needed to complete the tasks in the timing anticipated. PG&E reviewed progress to date on the IDSM Statewide and Local efforts and adjusted accordingly. (Note that the other IOUs did not request the additional funds for local support and programs, so it is reasonable that they are now requesting additional funds to achieve the steps needed to promote IDSM efforts across their organizations.)
Question 6.b	Please describe how PG&E will address added costs for developing its integrated audit tool as a result of having to hire an additional contractor to develop the small business component of the tool which was not originally budgeted for.

<sup>7</sup> Based on the Fund-Shifting ACR, the Local DSM Coordination and Integration program is part the Other Programs fund shifting category; the Statewide DSM Coordination and Integration is one of the Statewide Programs.

Response 6.b	The Integrated Audit tool is not funded by the Integrated Statewide or Local program budgets. The Integrated Audit tool, including the additional contracting, is funded under the non-residential audit subprogram of the Commercial, Industrial and Agricultural programs.
Question 6.c	Describe the impact any budget transfers will have on completing the eight tasks identified in PG&E's approved IDSM PIP, absent any formal direction from ED or the CPUC to defer completion of these tasks beyond 2012.
Response 6.c	Until further direction from Energy Division, the integrated cost effectiveness and integrated EM&V tasks are pending. All other tasks have been completed and are being tracked for the identification of barriers and best practices.
Question 6.d	Describe any impacts anticipated for integrated pilot programs, such as Green Communities and Innovator Pilots (also requesting to be cut), which were identified in D.09-09-047 as integrated pilot programs. Include a description of why there are unspent funds in these programs and what significance this has on the success of the pilots.
Response 6.d	PG&E does not anticipate any negative impact towards IDSM efforts as a result of the requested fund shifts for its pilot programs. See also PG&E's response to Question 2 regarding Zero Net Energy pilot programs and Question 3.a through 3.c regarding Green Communities and Innovator Pilots.
Question 6.e	Please provide additional information on which sales trainings workshops and Education and Training courses would be cut as a result of this fund shift and if/how these training activity cuts will impact promotion of IDSM internally at PG&E.
Response 6.e	No sales training efforts will be cut as a result of the budget reductions. Instead, PG&E is leveraging the current sales training efforts and has been able to reduce budgets without affecting the quality of the training. PG&E has also been able to add IDSM training efforts for program staff. Also consistent with IDSM metrics for WE&T, PG&E is expanding its efforts at the Training Centers by leveraging both IDSM and WE&T budgets.

## 7. Emerging Technologies Program

Question 7.a	Provide a list of ETP projects initiated in 2010 (funded by PY 2010-2012 program budget). For each of the ETP program elements outlined in the Table attached to the request, provide the information requested including:
--------------	--

	<p>(a) project budget,  (b) project time-line (initiation date, duration, and expected completion date),  (c) project status (e.g. started, completed, on-going),  (d) indicate which of the projects originated from PIER and other R&amp;D entities, and  (e) indicate which of the projects are long-term (i.e. has project time-line that exceeds 5-years)</p>
Response 7.a	<p>Energy Division attached a table in its request containing program objectives based on PG&amp;E's ETP PIP dated March 2009, rather than the revised PIP, that was uploaded on EEGA in January 2011. The current PIP includes the final approved ETP budget and revised objectives that align with the budget. PG&amp;E is focusing its effort to achieve the revised objectives. The requested information is shown on Attachment 5 hereto.</p>
Question 7.b.i	<p>Provide a breakdown of expenditures by specific projects to date (through 2011-Q3) that supports the ETP Goal (3): "Support the achievement of CAEESP BBEES (Objective 3.1: help advance at least 15 innovative measures and/or strategies to support ZNE...)"</p>
Response 7.b.i	<p>PG&amp;E's ZNE Pilot program is separate from ETP; however, the ETP team works with PG&amp;E's ZNE team on strategies to support ZNE, in accordance with the ZNE PIP and authorized program budget. Below is a breakdown of ZNE program expenditures through Q4 2011 in estimated direct contract costs by project:</p> <ul style="list-style-type: none"> <li>• Four ZNE consultations - \$50,000</li> <li>• Technology Assessment work - \$150,000</li> <li>• The ZNE Team held an "Architecture at Zero" design competition - \$100,000</li> </ul>
Question 7.b.ii	<p>Indicate the number of new "proven" ET measures initiated in 2010-2012 that have been adopted into the EE portfolio. For each measure identify the EE program that has adopted the ETP measure.</p>
Response 7.b.ii	<p>There were seven new "proven" ET measure initiated in 2010-2012 that have been adopted into the EE portfolio. They are:</p> <ol style="list-style-type: none"> <li>1. Heat Pump Water Heaters – Residential Program</li> <li>2. LED Street Lighting and Network Controls – Lighting Program</li> <li>3. Thin Client – Electronics Program</li> <li>4. LED for Hospital Operating Rooms – Industrial Program</li> </ol>

	<p>5. Hotel Room Occupancy Controls – Commercial Buildings Program</p> <p>6. Water Energy Study – Industrial Program</p> <p>7. Small Commercial Energy Management Systems (EMS) for HVAC and Lighting – Commercial Program</p>
Question 7.b.iii	Indicate the potential energy impacts (energy savings and demand reduction) of adopted ET measures from ETP into the EE portfolio.
Response 7.b.iii	<p>The potential energy impacts of adopted ET measure from the ETP into the EE portfolio is:</p> <ol style="list-style-type: none"> <li>1. Heat Pump Water Heaters – 1,143 GWh/yr, 251 MW/yr</li> <li>2. LED Street Lighting and Network Controls – 274 GWh/yr, 54 MW/yr</li> <li>3. Thin Client – 1023 GWh/yr, 408 MW/yr</li> <li>4. LED for Hospital Operating Rooms – 49.8 GWh/yr, 14 MW/yr, 0.529 MMTh</li> <li>5. Hotel Room Occupancy Controls – 43 GWh/yr, 12 MW/yr</li> <li>6. Water Energy Study – 500 GWh/yr, 50 MW</li> <li>7. Small Commercial Energy Management Systems (EMS) for HVAC and Lighting – 55 GWh, 31 MW</li> </ol>
Question 7.b.iv	Provide an updated ET roadmap reflecting 2010-2012 plans.
Response 7.b.iv	The current versions of the ET roadmaps are provided in Attachment 6 hereto.

### **Protests**

Pursuant to the Energy Division direction, this supplement does not extend the comment period.

### **Effective Date**

PG&E is filing this as a supplement to its original Tier 2 advice letter pursuant to GO 96-B and requests that both Advice 3235-G/3901-E and Advice 3235-G-A/3901-E-A be approved by Energy Division as soon as possible, but no later than **February 1, 2012**.

### **Notice**

In accordance with General Order 96-B, Section IV, and at the request of Energy Division, a copy of this advice letter is being sent electronically and via U.S. mail to parties shown on the attached list and the service list for R.09-11-014. Address changes to the General Order 96-B service list and all electronic approvals should be directed to e-mail [PGETariffs@pge.com](mailto:PGETariffs@pge.com). For changes to any other service list,

please contact the Commission's Process Office at (415) 703-2021 or at [Process\\_Office@cpuc.ca.gov](mailto:Process_Office@cpuc.ca.gov). Advice letter filings can also be accessed electronically at <http://www.pge.com/tariffs/>.

A handwritten signature in black ink that reads "Brian Cherry". The signature is written in a cursive style with a vertical line through the middle of the name.

Vice President – Regulation and Rates

cc: Service List R.09-11-014

- Attachment 1 - Budget Table
- Attachment 2 - ZNE Programmatic Targets
- Attachment 3 - LED Product Pricing
- Attachment 4 - LED Incentive Benchmarking
- Attachment 5 - ETP Projects
- Attachment 6 - ETP Roadmaps

# CALIFORNIA PUBLIC UTILITIES COMMISSION

## ADVICE LETTER FILING SUMMARY ENERGY UTILITY

MUST BE COMPLETED BY UTILITY (Attach additional pages as needed)

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

Utility type:

ELC       GAS  
 PLC       HEAT       WATER

Contact Person: Linda Tom-Martinez

Phone #: (415) 973-4612

E-mail: lmt1@pge.com

EXPLANATION OF UTILITY TYPE

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

(Date Filed/ Received Stamp by CPUC)

Advice Letter (AL) #: **3235-G-A/3901-E-A**

**Tier: 2**

Subject of AL: **Supplemental Filing: Request for Authority to Shift Funds and Make Other Program Modifications Pursuant to D.09-09-047 and D.11-07-030**

Keywords (choose from CPUC listing): Compliance, Energy Efficiency

AL filing type:  Monthly  Quarterly  Annual  One-Time  Other \_\_\_\_\_

If AL filed in compliance with a Commission order, indicate relevant Decision/Resolution #: D.09-09-047, D.11-07-030

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

Summarize differences between the AL and the prior withdrawn or rejected AL<sup>1</sup>: \_\_\_\_\_

Is AL requesting confidential treatment? If so, what information is the utility seeking confidential treatment for:

Confidential information will be made available to those who have executed a nondisclosure agreement:  Yes  No

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

Resolution Required?  Yes  No

Requested effective date: **February 1, 2012**

No. of tariff sheets:

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

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

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

Tariff schedules affected: N/A

Service affected and changes proposed<sup>1</sup>: N/A

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

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

**CPUC, Energy Division**

**Tariff Files, Room 4005**

**DMS Branch**

**505 Van Ness Ave.,**

**San Francisco, CA 94102**

**jnj@cpuc.ca.gov and mas@cpuc.ca.gov**

**Pacific Gas and Electric Company**

**Attn: Brian Cherry**

**Vice President, Regulation and Rates**

**77 Beale Street, Mail Code B10C**

**P.O. Box 770000**

**San Francisco, CA 94177**

**E-mail: PGETariffs@pge.com**

Attachment 1 - PG&E's 2010-2012 EE Portfolio Budget Table (AL 3235-G-A/3901-E-A)

Program #	Main Program Name / Sub-Programs	A Inception to Date Expenditures (as of 7/31/11)	B 2010-12 Authorized Budget (Compliance AL 3065-G-A&B/3562-E-A&B)	C 2010-12 Current Budget [1]	D 2010-12 Rebalanced Budget (AL 3235-G-3901-E)	(C-D) Budget Shifts	(F/[B/3]) % Annual Change in Fund Shift by Category [2]	Advice Filing Triggered
<b>1. Residential Programs</b>								
PGE21001	Home Energy Efficiency Surveys Program	\$9,551,002	\$21,018,892	\$21,018,892	\$23,618,892	\$2,600,000		
PGE21002	Residential Lighting Incentive Program for Basic CFLs	\$17,235,645	\$30,000,231	\$30,000,231	\$29,000,231	(\$1,000,000)		
PGE21003	Advanced Consumer Lighting Program	\$10,344,375	\$33,342,987	\$33,342,987	\$33,142,987	(\$200,000)		
PGE21004	Home Energy Efficiency Rebates	\$27,867,413	\$71,719,478	\$68,133,504	\$66,133,504	(\$2,000,000)		
PGE21005	Appliance Recycling Program	\$6,651,348	\$20,241,876	\$14,961,376	\$13,961,376	(\$1,000,000)		
PGE21006	Business and Consumer Electronics Program	\$18,511,642	\$31,006,237	\$31,006,237	\$31,006,237	\$0		
PGE21007	Multifamily Energy Efficiency Rebates Program	\$5,387,917	\$20,856,887	\$19,814,043	\$19,514,043	(\$300,000)		
PGE21008	Whole House Performance Program	\$6,562,604	\$46,000,035	\$42,200,022	\$29,700,022	(\$12,500,000)		
	<b>TOTAL RESIDENTIAL PROGRAMS</b>	<b>\$102,111,945</b>	<b>\$274,186,622</b>	<b>\$260,477,292</b>	<b>\$246,077,292</b>	<b>(\$14,400,000)</b>	<b>-16%</b>	<b>Yes</b>
<b>2. Commercial Programs</b>								
PGE21011	Calculated Incentives	\$43,014,584	\$77,344,484	\$77,344,484	\$80,344,484	\$3,000,000		
PGE21012	Deemed Incentives	\$39,501,384	\$58,516,685	\$58,516,685	\$66,516,685	\$8,000,000		
PGE21013	Continuous Energy Improvement	\$480,352	\$2,086,319	\$2,086,319	\$2,086,319	\$0		
PGE21014	Nonresidential Audits Program	\$3,033,761	\$20,237,598	\$20,237,598	\$15,237,598	(\$5,000,000)		
	<b>TOTAL COMMERCIAL PROGRAMS</b>	<b>\$86,030,081</b>	<b>\$158,185,086</b>	<b>\$158,185,086</b>	<b>\$164,185,086</b>	<b>\$6,000,000</b>	<b>11%</b>	<b>No</b>
<b>3. Industrial Programs</b>								
PGE21021	Calculated Incentives	\$29,356,105	\$58,870,106	\$55,201,746	\$53,501,746	(\$1,700,000)		
PGE21022	Deemed Incentives	\$5,672,144	\$10,742,233	\$10,742,233	\$10,742,233	\$0		
PGE21023	Continuous Energy Improvement	\$674,110	\$2,024,956	\$2,024,956	\$1,724,956	(\$300,000)		
PGE21024	Nonresidential Audits Program	\$213,495	\$1,729,912	\$1,729,912	\$1,729,912	\$0		
	<b>TOTAL INDUSTRIAL PROGRAMS</b>	<b>\$35,915,855</b>	<b>\$73,367,207</b>	<b>\$69,698,847</b>	<b>\$67,698,847</b>	<b>(\$2,000,000)</b>	<b>-8%</b>	<b>No</b>
<b>4. Agricultural Programs</b>								
PGE21031	Calculated Incentives	\$18,408,409	\$34,039,892	\$34,039,892	\$34,039,892	\$0		
PGE21032	Deemed Incentives	\$6,690,746	\$11,055,921	\$11,055,921	\$12,255,921	\$1,200,000		
PGE21033	Continuous Energy Improvement	\$517,580	\$2,024,956	\$2,024,956	\$1,424,956	(\$600,000)		
PGE21034	Nonresidential Audits Program	\$143,192	\$1,729,912	\$1,729,912	\$1,329,912	(\$400,000)		
PGE21035	Pump Efficiency Services Program	\$4,069,719	\$5,949,288	\$5,949,288	\$5,749,288	(\$200,000)		
	<b>TOTAL AGRICULTURAL PROGRAMS</b>	<b>\$29,829,646</b>	<b>\$54,799,970</b>	<b>\$54,799,970</b>	<b>\$54,799,970</b>	<b>\$0</b>	<b>0%</b>	<b>No</b>
<b>5. New Construction</b>								
PGE21041	Residential New Construction	\$6,389,611	\$13,521,688	\$13,521,688	\$13,521,688	\$0		
PGE21042	Savings By Design	\$16,935,254	\$25,015,572	\$25,015,572	\$25,015,572	\$0		
	<b>TOTAL NEW CONSTRUCTION PROGRAM</b>	<b>\$23,324,865</b>	<b>\$38,537,260</b>	<b>\$38,537,260</b>	<b>\$38,537,260</b>	<b>\$0</b>	<b>0%</b>	<b>No</b>
<b>6. Lighting Market Transformation</b>								
PGE2105	Lighting Market Transformation	\$363,146	\$462,565	\$462,565	\$462,565	\$0		
	<b>TOTAL LIGHTING MARKET TRANSFORMATION PROGRAM</b>	<b>\$363,146</b>	<b>\$462,565</b>	<b>\$462,565</b>	<b>\$462,565</b>	<b>\$0</b>	<b>0%</b>	<b>No</b>
<b>7. Residential &amp; Commercial HVAC</b>								
PGE21061	Upstream HVAC Equipment Incentive	\$5,665,712	\$17,902,313	\$17,902,313	\$17,902,313	\$0		
PGE21062	HVAC Technologies and System Diagnostics Advocacy	\$298,947	\$7,070,433	\$7,070,433	\$7,070,433	\$0		
PGE21063	Commercial Quality Installation	\$718,513	\$7,383,067	\$7,383,067	\$7,383,067	\$0		
PGE21064	ENERGY STAR Residential Quality Installation Program	\$1,685,647	\$13,711,409	\$13,711,409	\$13,711,409	\$0		
PGE21065	Residential and Commercial Quality Maintenance Development	\$13,196,943	\$9,378,683	\$9,378,683	\$9,378,683	\$0		
PGE21066	Workforce Education & Training	\$304,351	\$1,745,544	\$1,745,544	\$1,745,544	\$0		
	<b>TOTAL RESIDENTIAL &amp; COMMERCIAL HVAC PROGRAM</b>	<b>\$21,870,113</b>	<b>\$57,191,448</b>	<b>\$57,191,448</b>	<b>\$57,191,448</b>	<b>\$0</b>	<b>0%</b>	<b>No</b>
<b>8. Codes and Standards</b>								
PGE21071	C&S Advocacy & CASE Studies: Building Codes	\$6,444,570	\$8,415,444	\$8,415,444	\$8,415,444	\$0		
PGE21072	C&S Advocacy & CASE Studies: Appliance Standards	\$2,396,454	\$7,324,803	\$7,324,803	\$7,324,803	\$0		
PGE21073	C&S Compliance Enhancements Training	\$1,101,579	\$1,237,298	\$1,237,298	\$1,237,298	\$0		
PGE21074	C&S Coordination (Statewide, EE Programs, External Entities)	\$715,233	\$900,174	\$900,174	\$900,174	\$0		
PGE21075	C&S REACH Codes	\$467,577	\$1,383,790	\$1,383,790	\$1,383,790	\$0		
PGE21076	C&S Other	\$72,143	\$380,776	\$380,776	\$380,776	\$0		
	<b>TOTAL CODES &amp; STANDARDS PROGRAM</b>	<b>\$11,197,555</b>	<b>\$19,642,285</b>	<b>\$19,642,285</b>	<b>\$19,642,285</b>	<b>\$0</b>	<b>0%</b>	<b>No</b>
<b>9. Emerging Technologies</b>								
PGE21081	Assessments	\$3,988,431	\$19,106,905	\$19,106,905	\$14,072,326	(\$5,034,579)		
PGE21082	Scaled Field Placement	\$48,453	\$3,606,389	\$3,606,389	\$974,675	(\$2,631,714)		
PGE21083	Demonstration / Showcasing	\$16,642	\$3,653,659	\$3,653,659	\$1,546,620	(\$2,107,039)		
PGE21084	Market and Behavioral Studies	\$238,370	\$2,807,096	\$2,807,096	\$1,175,743	(\$1,631,353)		
PGE21085	Technology Supply Side Efforts	\$89,904	\$1,066,782	\$1,066,782	\$548,199	(\$518,583)		
PGE21086	Incubation	\$69,348	\$959,035	\$959,035	\$282,314	(\$676,720)		
	<b>TOTAL EMERGING TECHNOLOGIES PROGRAM</b>	<b>\$4,451,148</b>	<b>\$31,199,866</b>	<b>\$31,199,866</b>	<b>\$18,599,878</b>	<b>(\$12,599,989)</b>	<b>-121%</b>	<b>Yes</b>

Attachment 1 - PG&E's 2010-2012 EE Portfolio Budget Table (AL 3235-G-A/3901-E-A)

Program #	Main Program Name / Sub-Programs	A Inception to Date Expenditures (as of 7/31/11)	B 2010-12 Authorized Budget (Compliance AL 3065-G-A&B/3562-E- A&B)	C 2010-12 Current Budget [1]	D 2010-12 Rebalanced Budget (AL 3235-G-3901- E)	(C-D) Budget Shifts	(F/[B/3]) % Annual Change in Fund Shift by Category [2]	Advice Filing Triggered
<b>10. Workforce, Education &amp; Training</b>								
PGE2109	Workforce Education & Training							
PGE21091	WE&T Centergies	\$13,821,299	\$34,061,574	\$32,152,974	\$32,152,974	\$0		
PGE21092	WE&T Connections	\$2,716,632	\$4,110,424	\$4,110,424	\$4,110,424	\$0		
PGE21093	WE&T Strategic Plan Implementation	\$227,695	\$2,985,578	\$2,836,299	\$2,836,299	\$0		
	<b>TOTAL WORKFORCE EDUCATION &amp; TRAINING</b>	<b>\$16,765,625</b>	<b>\$41,157,576</b>	<b>\$39,099,697</b>	<b>\$39,099,697</b>	<b>\$0</b>	<b>0%</b>	<b>No</b>
<b>11. Marketing, Education &amp; Outreach</b>								
PGE21101	Statewide Marketing & Outreach	\$10,129,887	\$22,979,247	\$22,979,247	\$22,979,247	\$0		
PGE21102	ME&O Strategic Plan Support	\$483	\$1,969,135	\$1,969,135	\$1,969,135	\$0		
	<b>TOTAL MARKETING, EDUCATION &amp; OUTREACH</b>	<b>\$10,130,370</b>	<b>\$24,948,382</b>	<b>\$24,948,382</b>	<b>\$24,948,382</b>	<b>\$0</b>	<b>0%</b>	<b>No</b>
<b>12. DSM Coordination &amp; Integration</b>								
PGE2111	Statewide DSM Coordination & Integration	\$529,125	\$1,200,000	\$1,200,000	\$1,070,815	(\$129,185)		
	<b>TOTAL DSM COORDINATION &amp; INTEGRATION</b>	<b>\$529,125</b>	<b>\$1,200,000</b>	<b>\$1,200,000</b>	<b>\$1,070,815</b>	<b>(\$129,185)</b>	<b>-32%</b>	<b>Yes</b>
<b>13. Government Partnerships</b>								
PGE2126	Institutional/Statewide Government Partnerships	\$24,692,209	\$38,839,695	\$43,666,146	\$57,666,146	\$14,000,000		
Various	Local Government Partnership Programs	\$58,438,983	\$103,585,824	\$105,880,649	\$110,630,649	\$4,750,000		
	<b>TOTAL GOVERNMENT PARTNERSHIPS</b>	<b>\$83,131,192</b>	<b>\$142,425,519</b>	<b>\$149,546,795</b>	<b>\$168,296,795</b>	<b>\$18,750,000</b>	<b>39%</b>	<b>Yes</b>
<b>14. Third Party Programs</b>								
	<b>TOTAL THIRD PARTY PROGRAMS</b>	<b>\$148,449,580</b>	<b>\$289,979,191</b>	<b>\$304,478,150</b>	<b>\$320,785,343</b>	<b>\$16,307,193</b>	<b>17%</b>	<b>Yes</b>
<b>15. Other Programs</b>								
PGE21251	Innovator Pilots Program	\$1,273,677	\$8,826,248	\$8,384,935	\$7,464,935	(\$920,000)		
PGE21252	Green Communities	\$4,979,882	\$20,975,784	\$19,926,995	\$15,646,995	(\$4,280,000)		
PGE2112	Zero Net Energy Pilots (excluding EM&V)	\$1,077,351	\$12,250,007	\$11,555,443	\$5,698,239	(\$5,857,204)		
PGE2114	On-Bill Financing (Includes Loan Pool Amount)	\$2,181,311	\$27,844,983	\$27,844,983	\$27,844,983	\$0		
PGE2113	<b>Integrated DSM</b>							
PGE21131	Integrated Marketing	\$1,880,678	\$3,500,000	\$3,500,000	\$3,413,840	(\$86,160)		
PGE21132	Integrated Education & Training	\$74,721	\$300,000	\$300,000	\$215,770	(\$84,230)		
PGE21133	Integrated Sales Training	\$616,642	\$1,500,000	\$1,500,000	\$1,213,775	(\$286,225)		
PGE21134	Integration Support	\$459,351	\$2,000,000	\$2,000,000	\$1,585,801	(\$414,199)		
	<b>TOTAL LOCAL PROGRAMS</b>	<b>\$12,543,613</b>	<b>\$77,197,021</b>	<b>\$75,012,357</b>	<b>\$63,084,338</b>	<b>(\$11,928,019)</b>	<b>-46%</b>	<b>Yes</b>
<b>EM&amp;V (IOU COSTS)</b>								
EM&V	EM&V - IOU Costs + CPUC Costs [3]	\$3,094,655	\$53,520,000	\$53,520,000	\$53,520,000	\$0		
	<b>TOTAL IOU EM&amp;V</b>	<b>\$3,094,655</b>	<b>\$53,520,000</b>	<b>\$53,520,000</b>	<b>\$53,520,000</b>	<b>\$0</b>	<b>0%</b>	
	<b>GRAND TOTAL</b>	<b>\$589,738,514</b>	<b>\$1,338,000,000</b>	<b>\$1,338,000,000</b>	<b>\$1,338,000,000</b>	<b>\$0</b>	<b>0%</b>	

Notes:

[1]: The 2010-12 Current Budget reflects a 2010 fund shift of \$21.6 million

[2]: PG&E has applied the fundshifting rules per Attachment A of the *Assigned Commissioner's Ruling Clarifying Fund Shifting Rules and Reporting Requirements* dated December 22, 2011.

[3]: EM&V includes \$1.4 million approved for ZNE Pilots

Attachment 2  
Pacific Gas and Electric Company  
ZNE Pilot - Revised Quantitative Programmatic Targets  
AL 3235-G-A/3901-E-A

Subprograms	Description	Original specific PPM Element 2010-2012, cumulative (AL 3078-G-B / 3594-E-B, filed June 2010)	Revised Specific PPM Element, 2010-2012, cumulative (AL 3235-G-A/3901-E-A, filed January 2012)
<b>Subprogram 1, "ZNE Communities"</b>	<b>Community-level design assistance</b>		
		Consultation to at least 5 Project teams	Consultation to at least 3 Project teams ( <b>reduced from 5</b> )
		EM&V on projects selected	It is unlikely any projects selected for consultation will be suitable for EM&V prior to the end of the 2010-2012 cycle, therefore the revised target is <b>none selected</b> .
		Quarterly coordination meetings	<b>Remove</b> target as PPM, but will participate in ongoing champion meetings as scheduled
		Integration with resource programs	No change, will report results
<b>Subprogram 2, "ZNE Demonstration Showcase"</b>	<b>Project-level (building level) demonstration and documentation</b>		
		Design, technical and financial assistance to at least 8 residential buildings	Design, technical and, if feasible, financial assistance to at least 4 residential projects ( <b>reduced from 8</b> )
		Design, technical and financial assistance to at least 4 commercial buildings	Design, technical and, if feasible, financial assistance to at least 2 commercial projects ( <b>reduced from 4</b> )
		Technology studies on at least 5 advanced technical areas under-represented in ZNE arena	Technology studies on at least 4 advanced technical areas under-represented in ZNE arena ( <b>reduced to 4 from 5</b> )
		Resource web site on key information on projects and technologies	Resource web site on key information on projects and technologies ( <b>no change</b> from original)
<b>Subprogram 3, "ZNE Technology Advancement"</b>	<b>Technology assessments, demonstrations and market characterizations for ZNE</b>		
		Assessments of at least 25 technologies	Assessments of 5 technologies ( <b>reduced from 25</b> )
		Establish roadmap and market characterization by building type for ZNE	Establish roadmap and market characterization by building type for ZNE ( <b>no change</b> , will still complete roadmap and technical market assessment--funding is EM&V funding)
<b>Subprogram 4, "ZNE Design Integration"</b>	<b>Tools, training, education, and design competition</b>		
		Contribute to creation of at least one community, planning, decision-making and code-review tool	None, <b>removed</b> .

Attachment 2  
 Pacific Gas and Electric Company  
 ZNE Pilot - Revised Quantitative Programmatic Targets  
 AL 3235-G-A/3901-E-A

Subprograms	Description	Original specific PPM Element 2010-2012, cumulative (AL 3078-G-B / 3594-E-B, filed June 2010)	Revised Specific PPM Element, 2010-2012, cumulative (AL 3235-G-A/3901-E-A, filed January 2012)
		Coordination and facilitation of at least 2 forums of key ZNE players	Coordination and facilitation of at least 2 forums of key ZNE players ( <b>no change</b> )
		Present at least 25 public educational workshops on key ZNE topics	Present at least 25 public educational workshops on key ZNE topics ( <b>no change</b> )
		Conduct at least 2 design competitions among the architectural and student communities	Conduct at least 2 design competitions among the architectural and student communities ( <b>no change</b> )
		Develop 2-5 best practice guidelines for the commissioning, operation, and maintenance of ZNE buildings. These guidelines should be as fully representative of the residential and commercial market segments as feasible. Commercial market segments may need additional best practice guidelines to be applicable and useful for the varying types of commercial buildings (ie. office buildings, grocery stores, hospitals, multi-family housing projects, etc.);	Develop 2 best practice guidelines for the <b>design</b> , commissioning, operation, and maintenance of ZNE buildings. ( <b>Will complete 2</b> rather than "2-5")
		Investigate the development of at least 2-4 market based financing mechanisms to create Zero-Net development for residential and commercial buildings;	Investigate, via stakeholder meetings, white papers, or other methods, the development of at least 2 market based financing mechanisms to create Zero-Net development for residential and commercial buildings. ( <b>Will complete 2</b> rather than "2-4")

**MR 16**

**Measure Costs**

Brand	Price	Source
20 Watt		
Sylvania	\$ 22.13	<a href="http://www.lowes.com/pd_105495-3-78775_4294801193+4294867585_4294937087_?productId=3383392&amp;Ns=p_product_prd_lis_ord_nbr 0 p_product_qty_sales_dollar 1&amp;pl=1&amp;currentURL=%2Fpl_Yes_4294801193%2B4294867585_4294937087_%3FNs%3Dp_product_prd_lis_ord_nbr%7C0%7C%7Cp_product_qty_sales_dollar%7C1&amp;facetInfo=Yes">http://www.lowes.com/pd_105495-3-78775_4294801193+4294867585_4294937087_?productId=3383392&amp;Ns=p_product_prd_lis_ord_nbr 0 p_product_qty_sales_dollar 1&amp;pl=1&amp;currentURL=%2Fpl_Yes_4294801193%2B4294867585_4294937087_%3FNs%3Dp_product_prd_lis_ord_nbr%7C0%7C%7Cp_product_qty_sales_dollar%7C1&amp;facetInfo=Yes</a>
EcoSmart	\$ 19.97	<a href="http://www.homedepot.com/Energy-Star/Electrical-Light-Bulbs-LED-Light-Bulbs/h_d1/N-5yc1vZbm79Z1z141o3/R-202324434/h_d2/ProductDisplay?langId=-1&amp;storeId=10051&amp;catalogId=10053">http://www.homedepot.com/Energy-Star/Electrical-Light-Bulbs-LED-Light-Bulbs/h_d1/N-5yc1vZbm79Z1z141o3/R-202324434/h_d2/ProductDisplay?langId=-1&amp;storeId=10051&amp;catalogId=10053</a>
Philips	\$ 27.00	<a href="http://www.grainger.com/Grainger/PHILIPS-EnduraLED-Lamp-6EWL8?Pid=search">http://www.grainger.com/Grainger/PHILIPS-EnduraLED-Lamp-6EWL8?Pid=search</a>
Philips	\$ 24.05	<a href="http://www.platt.com/platt-electric-supply/LED-MR16/Philips/4MR16-END-2700-12V/product.aspx?zpid=826247">http://www.platt.com/platt-electric-supply/LED-MR16/Philips/4MR16-END-2700-12V/product.aspx?zpid=826247</a>
Lighting Science Group	\$ 22.99	<a href="http://www.polar-ray.com/Lighting-Science-MR16-LED_p_327.html&amp;catid=54">http://www.polar-ray.com/Lighting-Science-MR16-LED_p_327.html&amp;catid=54</a>
<b>Average Price</b>	<b>\$23.23</b>	

## PAR 20

### Measure Costs

Brand	Price	Source
Sylvania	\$26.90	<a href="http://www.lowes.com/pd_98941-3-78776_4294801193+4294867585_4294937087_?productId=3385464&amp;Ns=p_product_prd_lis_ord_nbr 0 p_product_qty_sales_dollar 1&amp;pl=1&amp;currentURL=%2Fpl_Yes_4294801193%2B4294867585_4294937087_%3FNs%3Dp_product_prd_lis_ord_nbr%7C0%7C%7Cp_product_qty_sales_dollar%7C1&amp;facetInfo=Yes">http://www.lowes.com/pd_98941-3-78776_4294801193+4294867585_4294937087_?productId=3385464&amp;Ns=p_product_prd_lis_ord_nbr 0 p_product_qty_sales_dollar 1&amp;pl=1&amp;currentURL=%2Fpl_Yes_4294801193%2B4294867585_4294937087_%3FNs%3Dp_product_prd_lis_ord_nbr%7C0%7C%7Cp_product_qty_sales_dollar%7C1&amp;facetInfo=Yes</a>
Sylvania	\$29.98	<a href="http://www.lowes.com/pd_351114-3-78727_4294801193+4294867585_4294937087_?productId=3376042&amp;Ns=p_product_prd_lis_ord_nbr 0 p_product_qty_sales_dollar 1&amp;pl=1&amp;currentURL=%2Fpl_Yes_4294801193%2B4294867585_4294937087_%3FNs%3Dp_product_prd_lis_ord_nbr%7C0%7C%7Cp_product_qty_sales_dollar%7C1&amp;facetInfo=Yes">http://www.lowes.com/pd_351114-3-78727_4294801193+4294867585_4294937087_?productId=3376042&amp;Ns=p_product_prd_lis_ord_nbr 0 p_product_qty_sales_dollar 1&amp;pl=1&amp;currentURL=%2Fpl_Yes_4294801193%2B4294867585_4294937087_%3FNs%3Dp_product_prd_lis_ord_nbr%7C0%7C%7Cp_product_qty_sales_dollar%7C1&amp;facetInfo=Yes</a>
GE	\$44.00	<a href="http://www.grainger.com/Grainger/GE-LIGHTING-LED-Lamp-6XWJ2?Pid=search">http://www.grainger.com/Grainger/GE-LIGHTING-LED-Lamp-6XWJ2?Pid=search</a>
Toshiba	\$37.99	<a href="http://www.polar-ray.com/Toshiba-PAR20-LED-Light-Bulb_p_268.html&amp;catid=75">http://www.polar-ray.com/Toshiba-PAR20-LED-Light-Bulb_p_268.html&amp;catid=75</a>
Sylvania	\$34.99	<a href="http://www.polar-ray.com/Sylvania-Ultra-PAR20-LED-Bulb_p_326.html&amp;catid=75">http://www.polar-ray.com/Sylvania-Ultra-PAR20-LED-Bulb_p_326.html&amp;catid=75</a>
<b>Average Price</b>	<b>\$34.77</b>	

**PAR 30**

**Measures Costs**

Brand	Price	Source
Sylvania	\$44.98	<a href="http://www.lowes.com/pd_104653-3-78777_4294801193+4294867585_4294937087_?productId=3374258&amp;Ns=p_product_prd_lis_ord_nbr 0 p_product_qty_sales_dollar 1&amp;pl=1&amp;currentURL=%2Fpl_Yes_4294801193%2B4294867585_4294937087_%3F%3Dp_product_prd_lis_ord_nbr%7C0%7C%7Cp_product_qty_sales_dollar%7C1&amp;facetInfo=Yes">http://www.lowes.com/pd_104653-3-78777_4294801193+4294867585_4294937087_?productId=3374258&amp;Ns=p_product_prd_lis_ord_nbr 0 p_product_qty_sales_dollar 1&amp;pl=1&amp;currentURL=%2Fpl_Yes_4294801193%2B4294867585_4294937087_%3F%3Dp_product_prd_lis_ord_nbr%7C0%7C%7Cp_product_qty_sales_dollar%7C1&amp;facetInfo=Yes</a>
Array	\$59.98	<a href="http://www.lowes.com/pd_325921-29422-AE26R3083025_4294801193+4294867585_4294937087_?productId=3351848&amp;Ns=p_product_prd_lis_ord_nbr 0 p_product_qty_sales_dollar 1&amp;pl=1&amp;currentURL=%2Fpl_Yes_4294801193%2B4294867585_4294937087_%3F%3Dp_product_prd_lis_ord_nbr%7C0%7C%7Cp_product_qty_sales_dollar%7C1&amp;facetInfo=Yes">http://www.lowes.com/pd_325921-29422-AE26R3083025_4294801193+4294867585_4294937087_?productId=3351848&amp;Ns=p_product_prd_lis_ord_nbr 0 p_product_qty_sales_dollar 1&amp;pl=1&amp;currentURL=%2Fpl_Yes_4294801193%2B4294867585_4294937087_%3F%3Dp_product_prd_lis_ord_nbr%7C0%7C%7Cp_product_qty_sales_dollar%7C1&amp;facetInfo=Yes</a>
GE	\$45.98	<a href="http://www.lowes.com/pd_353831-371-64312_4294801193+4294867585_4294937087_?productId=3408946&amp;Ns=p_product_prd_lis_ord_nbr 0 p_product_qty_sales_dollar 1&amp;pl=1&amp;currentURL=%2Fpl_Yes_4294801193%2B4294867585_4294937087_%3F%3Dp_product_prd_lis_ord_nbr%7C0%7C%7Cp_product_qty_sales_dollar%7C1&amp;facetInfo=Yes">http://www.lowes.com/pd_353831-371-64312_4294801193+4294867585_4294937087_?productId=3408946&amp;Ns=p_product_prd_lis_ord_nbr 0 p_product_qty_sales_dollar 1&amp;pl=1&amp;currentURL=%2Fpl_Yes_4294801193%2B4294867585_4294937087_%3F%3Dp_product_prd_lis_ord_nbr%7C0%7C%7Cp_product_qty_sales_dollar%7C1&amp;facetInfo=Yes</a>
Sylvania	\$49.98	<a href="http://www.lowes.com/pd_351115-3-78728_4294801193+4294867585_4294937087_?productId=3376044&amp;Ns=p_product_prd_lis_ord_nbr 0 p_product_qty_sales_dollar 1&amp;pl=1&amp;currentURL=%2Fpl_Yes_4294801193%2B4294867585_4294937087_%3F%3Dp_product_prd_lis_ord_nbr%7C0%7C%7Cp_product_qty_sales_dollar%7C1&amp;facetInfo=Yes">http://www.lowes.com/pd_351115-3-78728_4294801193+4294867585_4294937087_?productId=3376044&amp;Ns=p_product_prd_lis_ord_nbr 0 p_product_qty_sales_dollar 1&amp;pl=1&amp;currentURL=%2Fpl_Yes_4294801193%2B4294867585_4294937087_%3F%3Dp_product_prd_lis_ord_nbr%7C0%7C%7Cp_product_qty_sales_dollar%7C1&amp;facetInfo=Yes</a>
EcoSmart	\$34.97	<a href="http://www.homedepot.com/Energy-Star/Electrical-Light-Bulbs-LED-Light-Bulbs/h_d1/N-5yc1vZbm79Z1z141o3/R-202324428/h_d2/ProductDisplay?langId=-1&amp;storeId=10051&amp;catalogId=10053">http://www.homedepot.com/Energy-Star/Electrical-Light-Bulbs-LED-Light-Bulbs/h_d1/N-5yc1vZbm79Z1z141o3/R-202324428/h_d2/ProductDisplay?langId=-1&amp;storeId=10051&amp;catalogId=10053</a>
Philips	\$37.95	<a href="http://www.polar-ray.com/Philips-AmbientLED-Long-Neck-PAR30_p_238.html&amp;catid=76">http://www.polar-ray.com/Philips-AmbientLED-Long-Neck-PAR30_p_238.html&amp;catid=76</a>
Sylvania	\$49.95	<a href="http://www.polar-ray.com/Sylvania-PAR30-Long-Neck-LED-Bulb_p_277.html&amp;catid=76">http://www.polar-ray.com/Sylvania-PAR30-Long-Neck-LED-Bulb_p_277.html&amp;catid=76</a>
Toshiba	\$52.99	<a href="http://www.polar-ray.com/Toshiba-PAR30-Short-Neck-LED-Bulb_p_284.html&amp;catid=76">http://www.polar-ray.com/Toshiba-PAR30-Short-Neck-LED-Bulb_p_284.html&amp;catid=76</a>
Philips	\$64.75	<a href="http://www.platt.com/platt-electric-supply/LED-Par/Philips/11PAR30SENF22/product.aspx?zpid=823056">http://www.platt.com/platt-electric-supply/LED-Par/Philips/11PAR30SENF22/product.aspx?zpid=823056</a>
GE	\$56.00	<a href="http://www.grainger.com/Grainger/GE-LIGHTING-LED-Lamp-6XWJ5?Pid=search">http://www.grainger.com/Grainger/GE-LIGHTING-LED-Lamp-6XWJ5?Pid=search</a>
<b>Average Price</b>	<b>\$49.75</b>	

**PAR 38**

**Measure Costs**

Brand	Price	Source
Philips	\$38.97	<a href="http://www.homedepot.com/Energy-Star/Electrical-Light-Bulbs-LED-Light-Bulbs/h_d1/N-5yc1vZbm79Z1z141o3/R-202904632/h_d2/ProductDisplay?langId=-1&amp;storeId=10051&amp;catalogId=10053">http://www.homedepot.com/Energy-Star/Electrical-Light-Bulbs-LED-Light-Bulbs/h_d1/N-5yc1vZbm79Z1z141o3/R-202904632/h_d2/ProductDisplay?langId=-1&amp;storeId=10051&amp;catalogId=10053</a>
EcoSmart	\$36.97	<a href="http://www.homedepot.com/Energy-Star/Electrical-Light-Bulbs-LED-Light-Bulbs/h_d1/N-5yc1vZbm79Z1z141o3/R-202324426/h_d2/ProductDisplay?langId=-1&amp;storeId=10051&amp;catalogId=10053">http://www.homedepot.com/Energy-Star/Electrical-Light-Bulbs-LED-Light-Bulbs/h_d1/N-5yc1vZbm79Z1z141o3/R-202324426/h_d2/ProductDisplay?langId=-1&amp;storeId=10051&amp;catalogId=10053</a>
GE	\$59.98	<a href="http://www.lowes.com/pd_338896-371-64216_4294801193+4294867585_4294937087_?productId=3378846&amp;Ns=p_product_prd_lis_ord_nbr 0  p_p_rduct_qty_sales_dollar 1&amp;pl=1&amp;currentURL=%2Fpl_Yes_4294801193%2B4294867585_4294937087_%3F%3Dp_product_prd_lis_ord_nbr%7C0%7C%7Cp_product_qty_sales_dollar%7C1&amp;facetInfo=Yes">http://www.lowes.com/pd_338896-371-64216_4294801193+4294867585_4294937087_?productId=3378846&amp;Ns=p_product_prd_lis_ord_nbr 0  p_p_rduct_qty_sales_dollar 1&amp;pl=1&amp;currentURL=%2Fpl_Yes_4294801193%2B4294867585_4294937087_%3F%3Dp_product_prd_lis_ord_nbr%7C0%7C%7Cp_product_qty_sales_dollar%7C1&amp;facetInfo=Yes</a>
Sylvania	\$54.98	<a href="http://www.lowes.com/pd_351126-3-78726_4294801193+4294867585_4294937087_?productId=3376054&amp;Ns=p_product_prd_lis_ord_nbr 0  p_p_rduct_qty_sales_dollar 1&amp;pl=1&amp;currentURL=%2Fpl_Yes_4294801193%2B4294867585_4294937087_%3F%3Dp_product_prd_lis_ord_nbr%7C0%7C%7Cp_product_qty_sales_dollar%7C1&amp;facetInfo=Yes">http://www.lowes.com/pd_351126-3-78726_4294801193+4294867585_4294937087_?productId=3376054&amp;Ns=p_product_prd_lis_ord_nbr 0  p_p_rduct_qty_sales_dollar 1&amp;pl=1&amp;currentURL=%2Fpl_Yes_4294801193%2B4294867585_4294937087_%3F%3Dp_product_prd_lis_ord_nbr%7C0%7C%7Cp_product_qty_sales_dollar%7C1&amp;facetInfo=Yes</a>
Philips	\$39.99	<a href="http://www.polar-ray.com/PAR38-LED-Bulbs_c_77.html">http://www.polar-ray.com/PAR38-LED-Bulbs_c_77.html</a>
Sylvania	\$57.99	<a href="http://www.polar-ray.com/Sylvania-PAR38-LED-Lamp_p_274.html&amp;catid=77">http://www.polar-ray.com/Sylvania-PAR38-LED-Lamp_p_274.html&amp;catid=77</a>
Toshiba	\$60.99	<a href="http://www.polar-ray.com/Toshiba-PAR38-LED-Bulb_p_265.html&amp;catid=77">http://www.polar-ray.com/Toshiba-PAR38-LED-Bulb_p_265.html&amp;catid=77</a>
GE	\$60.00	<a href="http://www.grainger.com/Grainger/GE-LIGHTING-LED-Lamp-6XWK0?Pid=search">http://www.grainger.com/Grainger/GE-LIGHTING-LED-Lamp-6XWK0?Pid=search</a>
GE	\$67.00	<a href="http://www.grainger.com/Grainger/GE-LIGHTING-LED-Lamp-6XWK2?Pid=search">http://www.grainger.com/Grainger/GE-LIGHTING-LED-Lamp-6XWK2?Pid=search</a>
<b>Average Price</b>	<b>\$52.99</b>	

## Recessed Retrofit Fixtures

### Measure Costs

Brand	Price	Source
Halo	\$79.87	<a href="http://www.homedepot.com/h_d1/N-5yc1v/R-202762634/h_d2/ProductDisplay?langId=-1&amp;storeId=10051&amp;catalogId=10053">http://www.homedepot.com/h_d1/N-5yc1v/R-202762634/h_d2/ProductDisplay?langId=-1&amp;storeId=10051&amp;catalogId=10053</a>
Halo	\$89.00	<a href="http://www.homedepot.com/Lighting-Fans-Indoor-Lighting-Indoor-Ceiling-Lighting-Recessed-Lighting/h_d1/N-5yc1vZbvlwZ1z115g2/R-202024773/h_d2/ProductDisplay?langId=-1&amp;storeId=10051&amp;catalogId=10053">http://www.homedepot.com/Lighting-Fans-Indoor-Lighting-Indoor-Ceiling-Lighting-Recessed-Lighting/h_d1/N-5yc1vZbvlwZ1z115g2/R-202024773/h_d2/ProductDisplay?langId=-1&amp;storeId=10051&amp;catalogId=10053</a>
Commercial Electric	\$44.97	<a href="http://www.homedepot.com/Lighting-Fans-Indoor-Lighting-Indoor-Ceiling-Lighting-Recessed-Lighting/h_d1/N-5yc1vZbvlwZ1z115g2/R-203010505/h_d2/ProductDisplay?langId=-1&amp;storeId=10051&amp;catalogId=10053">http://www.homedepot.com/Lighting-Fans-Indoor-Lighting-Indoor-Ceiling-Lighting-Recessed-Lighting/h_d1/N-5yc1vZbvlwZ1z115g2/R-203010505/h_d2/ProductDisplay?langId=-1&amp;storeId=10051&amp;catalogId=10053</a>
Commercial Electric	\$39.97	<a href="http://www.homedepot.com/Lighting-Fans-Indoor-Lighting-Indoor-Ceiling-Lighting-Recessed-Lighting-Kits/h_d1/N-5yc1vZbvnuZ1z115g2/R-202596699/h_d2/ProductDisplay?langId=-1&amp;storeId=10051&amp;catalogId=10053">http://www.homedepot.com/Lighting-Fans-Indoor-Lighting-Indoor-Ceiling-Lighting-Recessed-Lighting-Kits/h_d1/N-5yc1vZbvnuZ1z115g2/R-202596699/h_d2/ProductDisplay?langId=-1&amp;storeId=10051&amp;catalogId=10053</a>
Sylvania	\$52.97	<a href="http://www.polar-ray.com/Sylvania-RT6-LED-Can-Light_p_272.html">http://www.polar-ray.com/Sylvania-RT6-LED-Can-Light_p_272.html</a>
Cree	\$46.97	<a href="http://www.polar-ray.com/Cree-CR6_p_199.html">http://www.polar-ray.com/Cree-CR6_p_199.html</a>
Halo	\$59.99	<a href="http://www.polar-ray.com/Halo-All-Pro-LED-RL706830WBS_p_233.html">http://www.polar-ray.com/Halo-All-Pro-LED-RL706830WBS_p_233.html</a>
Cree	\$79.95	<a href="http://www.polar-ray.com/Cree-LR6_p_1.html">http://www.polar-ray.com/Cree-LR6_p_1.html</a>
Lighting Science Group	\$47.99	<a href="http://www.polar-ray.com/Lighting-Science-Glimpse-LED-Downlight_p_321.html">http://www.polar-ray.com/Lighting-Science-Glimpse-LED-Downlight_p_321.html</a>
Sylvania	\$49.98	<a href="http://www.lowes.com/pd_78215-3-70644_0_?productId=3334616&amp;Ntt=recessed+lighting+kit&amp;pl=1&amp;currentURL=%2Fpl_0_s%3FNtt%3Drecessed%2Blighting%2Bkit&amp;facetInfo=">http://www.lowes.com/pd_78215-3-70644_0_?productId=3334616&amp;Ntt=recessed+lighting+kit&amp;pl=1&amp;currentURL=%2Fpl_0_s%3FNtt%3Drecessed%2Blighting%2Bkit&amp;facetInfo=</a>
<b>Average Price</b>	<b>\$59.17</b>	

Pacific Gas and Electric Company  
Attachment 4 - LED Incentive Benchmarking  
AL 3235-G-A/3901-E-A

<b>Utility</b>	<b>LED Product Rebate Amount</b>	<b>Source</b>
Efficiency Vermont	\$20-\$40	<a href="http://www.encyvermont.com/for_my_business/ways-to-save-and-rebates/commercial_lighting/commercial_led/rebates.aspx">http://www.encyvermont.com/for_my_business/ways-to-save-and-rebates/commercial_lighting/commercial_led/rebates.aspx</a>
SMUD	\$35	<a href="https://www.smud.org/en/residential/save-energy/rebates-incentives-financing/energy-efficient-lighting/LED-lighting.htm">https://www.smud.org/en/residential/save-energy/rebates-incentives-financing/energy-efficient-lighting/LED-lighting.htm</a>
Xcel Energy	\$20-\$35	<a href="http://www.mnenergysmart.com/xcel-energy-introduces-new-led-lighting-rebates/">http://www.mnenergysmart.com/xcel-energy-introduces-new-led-lighting-rebates/</a>
NSTAR		<a href="http://www.energyfederation.org/estarlights/default.php/cPath/4249_5948">http://www.energyfederation.org/estarlights/default.php/cPath/4249_5948</a>
National Grid		
Cape Light Compact	Up to \$30	
Western Massachusetts Electric		

Pacific Gas and Electric Company  
Attachment 5 – Emerging Technology Program Projects  
AL 3235-G-A/3901-E-A

Project Name	Project Budget <sup>1</sup>	Project Time Line	Project Status	Project Origins	Long Term Project
<b>Technology Assessments:</b>					
1. Smart Cool	\$15,000	Jan 2009 – Jan 2010	Completed	PG&E	No
2. LED Street Lighting and Network Controls	\$56,000	Sept 2009 – Jan 2010	Report Posted	PG&E	No
3. Swimming Pool Control	No cost figures since internal labor costs.	March 2009 – Mar 2010	Report Posted	PG&E	No
4. Heat Pump Water Heater Lab Test	No cost figures since internal labor costs.	Nov 2009 – Mar 2010	Report Posted	PG&E	No
5. LED for Hospital Operating Rooms	\$41,596	Dec 2009 – May 2010	Report Posted	PG&E	No
6. Thin Client	\$50,000	Nov 2009 - June 2010	Report Posted	LBNL	No
7. Hotel Room Occupancy Controls	\$196,720	Sept 2009 - June 2010	Report Posted	PG&E	No
8. M2G Ameritac boiler controller	\$157,942	Oct 2009 - June 2012	Pending Final Report	PG&E	No
9. eQuest Tool	\$80,000	Jan 2009 – Aug 2010	Report Posted	DOE	No
10. EPRI RESD Project Management (ATS)	\$50,000	Mar 2010 – Dec 2010	Report Posted	EPRI	No
11. Advanced Radiant HVAC Systems for CA Homes - CEC RFP#500-07-503	\$14,000	Feb 2010 – Dec 2012	Project In Progress	CEC	No
12. Residential Water Heating Program Proposal - CEC RFP#500-07-503	\$65,000	Feb 2010 – Dec 2012	Project In Progress	CEC	No
13. Data Center Air Management Research	\$46,025	Jan 2009 – Sept 2010	Report Posted	PG&E	No
14. Integrated Retrofit Solutions for Untapped Markets	\$118,000	Mar 2010 – Dec 2012	Project In Progress	UC Davis, WCEC	No
15. Water Energy Study - SJWC	\$33,500	Oct 2009 – July 2010	Report Posted	PG&E	No

<sup>1</sup> This is the contract amount and does not include PG&E's staff support for the project.

<b>Project Name</b>	<b>Project Budget<sup>1</sup></b>	<b>Project Time Line</b>	<b>Project Status</b>	<b>Project Origins</b>	<b>Long Term Project</b>
16. Water Energy Study - EBMUD	\$33,500	Oct 2009 – July 2010	Report Posted	PG&E	No
17. PC and Imaging Equipment Baseline-Thin Client	\$89,000	Nov 2009 – April 2010	Report Posted	PG&E	No
18. Integrated Lighting System ET Technology Development	\$24,116	Oct 2009 – May 2010	Report Posted	UC Davis - CLTC	No
19. Heat Pump Water Heaters (HPWH) Lab Test	No cost figures since internal labor costs.	Mar 2010 – Sept 2010	Report Posted	PG&E	No
20. Small Commercial Energy Management Systems (EMS) for HVAC and Lighting	\$47,635	Feb 2010 – Aug 2010	Report Posted	PG&E	No
21. Carbon and Energy Management Systems C3 Software	\$170,000	June 2010 – June 2012	Final Report Pending	PG&E	No
22. Oil Well Pump Optimization Development	\$100,000	July 2010 – July 2012	Project In Progress	PG&E	No
23. Advanced Window Films	\$285,000	June 2011 – August 2012	Project In Progress	PG&E	No
24. Agricultural Irrigation Optimization Tool	\$100,000	May 2011 – August 2012	Project In Progress	PG&E	No
25. Data Center Infrastructure Management	\$100,000	Mar 2011 – June 2012	Project In Progress	PG&E	No
26. Heat Pump Water Heaters (HPWH) Field Study	\$34,455	Mar 2010 – Sept 2010	Report Posted	PG&E	No
27. Moving Bed Bio Reactor (MBBR) and Algae Treatment Process for Waste Water Treatment Plants	\$65,000	Oct 2011 – July 2012	Project in Progress	PG&E	No
28. Smart Thermostats	\$500,000	Nov 2011 – Dec 2012	Project in Progress	PG&E	No

**Scaled Field Placement (SFP):**

1. Follow Up Linear Panel and Controls Study	\$150,000	June 2011 – July 2012	Project in Progress	DOE/PNNL	No
--	-----------	-----------------------	---------------------	----------	----

Project Name	Project Budget <sup>1</sup>	Project Time Line	Project Status	Project Origins	Long Term Project
(GSA)					
2. EPRI - Coordinated Early Deployments of Efficient end-use Tech-Phase 1	\$50,000	May 2011 – Mar 2012	Project in Progress	EPRI	No

#### Demonstration Showcases (DS):

1. Strategic Options for Increasing Energy Efficiency in Large Office Buildings – Phase III	\$135,120	November 2009 – January 2012	Pending Final Report	PG&E	No
2. Lighting Showcase at CLTC	\$150,000	Dec 2011 – Nov 2012	Project in Progress	CLTC	No

#### Market and Behavioral Studies (M&B):

1. Waste Water Scoping Study	\$40,000	June 2010 July 2012	Project in Progress	PG&E	No
2. Lighting MSB Conjoint Study	\$80,000	Nov 2010 – Mar 2012	Pending Final Report	PG&E	No
3. HVAC Quality Maintenance Standards Implementation Behavioral Study	\$150,000	May 2011 – Nov 2011	Report Posted	PG&E	No
4. Smart Thermostats	\$500,000	Nov 2011- Dec 2012	Project in Progress	PG&E	No

#### Technology Development Support (TDS):

1. Part-Load Boiler Efficiency Test Procedure	\$200,000	May 2011 – April 2012	Project in Progress	ASHRE/ PG&E	Yes
2. Commercial HVAC Quality Maintenance Standards Implementation Calibration and Diagnostic Protocol	\$60,000	May 2011 – June 2012	Project in Progress	PG&E	No
3. Residential HVAC Quality Installation	\$50,000	May 2011 – June 2012	Project in Progress	PG&E	No

# Advice 3235-G-A/3901-E-A

Attachment 6



**Lighting Technology Roadmap**  
(Draft Document - For discussion purposes only)

Category	Technology	2008 Q4	2009 Q1	2009 Q2	2009 Q3	2009 Q4	2010 Q1	2010 Q2	2010 Q3	2010 Q4	2011 Q1	2011 Q2	2011 Q3	2011 Q4	2012 Q1	2012 Q2	2012 Q3	2012 Q4	2013 Q1	2013 Q2	2013 Q3	2014 Q4
ET/TT	LED Street Lighting LS-2 Municipalities	ET Assessment	TT Development																			
PROGRAMS	LED Street Lighting LS-2 Municipalities					Deployment																
C&S	LED Street Lighting LS-2 Municipalities				Energy Star Spec Category A 1,2 (?)																	
ET/TT	Super CFL (Universal Lamp)	TT Development																				
PROGRAMS	Super CFL (Universal Lamp)					Deployment																
C&S	Super CFL (Universal Lamp)																					
ET/TT	350 Lumen MR16 and 500 Lumen P38 LED Replacement Lamp	ET Assessment	TT Development																			
PROGRAMS	351 Lumen MR16 and 500 Lumen P38 LED Replacement Lamp									Deployment												
C&S	352 Lumen MR16 and 500 Lumen P38 LED Replacement Lamp				Energy Star Spec Category A 1,2 (?)																	
ET/TT	LED Parking Lot and Area Lighting	ET Assessment	TT Development																			
PROGRAMS	LED Parking Lot and Area Lighting									Deployment												
C&S	LED Parking Lot and Area Lighting				Energy Star Spec Category A 1,2 (?)																	
ET/TT	LED Low Bay Parking Garage Lighting (with Occupancy Sensors)		ET Assessment	TT Development																		
PROGRAMS	LED Low Bay Parking Garage Lighting (with Occupancy Sensors)									Deployment												
C&S	LED Low Bay Parking Garage Lighting (with Occupancy Sensors)				Energy Star Spec Category A 1,2 (?)																	
ET/TT	Induction Lighting with Occupancy Sensors for Parking Garage		CLTC Assessment / ET Evaluation	TT Development																		
PROGRAMS	Induction Lighting with Occupancy Sensors for Parking Garage									Deployment												
C&S	Induction Lighting with Occupancy Sensors for Parking Garage																					
ET/TT	LED Undercabinet and Task	ET Assessment	TT Development																			
PROGRAMS	LED Undercabinet and Task									Deployment												
C&S	LED Undercabinet and Task				Energy Star Spec Category A 1,2 (?)																	
ET/TT	Retrofit High Efficiency Office Lighting (Task/ Ambient, Office of the Future)		ET Assessment	TT Development																		
PROGRAMS	Retrofit High Efficiency Office Lighting (Task/ Ambient, Office of the Future)									Deployment												
C&S	Retrofit High Efficiency Office Lighting (Task/ Ambient, Office of the Future)				Title 24(?)																	
ET/TT	Demand Response Wireless Lighting Controls	ET Assessment	TT Development																			
PROGRAMS	Demand Response Wireless Lighting Controls									Deployment												
C&S	Demand Response Wireless Lighting Controls																					Title 24 ?
ET/TT	Retrofit Integrated Classroom Lighting System		ET Assessment	TT Development																		
PROGRAMS	Retrofit Integrated Classroom Lighting System									Deployment												
C&S	Retrofit Integrated Classroom Lighting System																					
ET/TT	High Efficiency HID Electronic Ballasts and Retrofit Luminaires	CLTC/ ET Asses	TT Development																			
PROGRAMS	High Efficiency HID Electronic Ballasts and Retrofit Luminaires									Deployment												
C&S	High Efficiency HID Electronic Ballasts and Retrofit Luminaires																					
ET/TT	LED Street Lighting Control Systems		ET Assessment	TT Development																		
PROGRAMS	LED Street Lighting Control Systems																					Deployment
C&S	LED Street Lighting Control Systems																					
ET/TT	LED Indoor Ambient General Lighting (Recessed Downlights and Retrofit Modules)	ET Assessment	TT Development																			
PROGRAMS	LED Indoor Ambient General Lighting (Recessed Downlights and Retrofit Modules)									Deployment												
C&S	LED Indoor Ambient General Lighting (Recessed Downlights and Retrofit Modules)				Energy Star Spec Category A 1,0																	
ET/TT	Remaining DOE Energy Star Category A 1.0*																					
PROGRAMS	Remaining DOE Energy Star Category A 1.0*																					
C&S	Remaining DOE Energy Star Category A 1.0*				Energy Star Spec Category A 1,0																	
ET/TT	Remaining DOE Energy Star Category A 1.1**				ET Assessment	TT Development																
PROGRAMS	Remaining DOE Energy Star Category A 1.1**																					Deployment
C&S	Remaining DOE Energy Star Category A 1.1**				Energy Star Spec Category A 1,1																	
ET/TT	Advanced Skylighting / Daylighting	ET Assessment	TT Development																			
PROGRAMS	Advanced Skylighting / Daylighting									Deployment												
C&S	Advanced Skylighting / Daylighting																					
ET/TT	Workforce Education - Contractor (CALCTP)																					
PROGRAMS	Workforce Education - Contractor (CALCTP)																					
C&S	Workforce Education - Contractor (CALCTP)																					
ET/TT	Simplified Daylight Harvesting, Perimeter Private Office		ET Assessment	TT Development																		
PROGRAMS	Simplified Daylight Harvesting, Perimeter Private Office									Deployment												
C&S	Simplified Daylight Harvesting, Perimeter Private Office																					
ET/TT	DOE Energy Star Category B Omnidirectional Products Including T8 and A19 Lamps										ET Assessment	TT Development										
PROGRAMS	DOE Energy Star Category B Omnidirectional Products Including T8 and A19 Lamps																					Deployment
C&S	DOE Energy Star Category B Omnidirectional Products Including T8 and A19 Lamps										Energy Star Spec Category B											
ET/TT	Quarterly Lighting Catalog Updates										ET Assessment	TT Development										
PROGRAMS	Quarterly Lighting Catalog Updates																					Deployment
C&S	Quarterly Lighting Catalog Updates										Energy Star Spec Category B											
ET/TT	CFL Recycling Program		Development																			
PROGRAMS	CFL Recycling Program																					Deployment
C&S	CFL Recycling Program																					

\*Undercabinet Kitchen Lighting, Undercabinet Shelf-Mounted Task Lighting, Portable Desk Task Lights, Outdoor Wall-Mounted Porch Lights, Outdoor Step Lights, Outdoor Pathway Lights

\*\*Surface and Pendant-Mounted Downlights, Outdoor Pole/Arm-Mounted Area and Roadway Luminaires, Outdoor Pole/Arm-Mounted Decorative Luminaires, Outdoor Wall-Mounted Area Luminaires (Wall Packs), Bollards, Wall Wash Luminaires, Ceiling Mounted Luminaires with Diffusers, Ceiling Mounted Luminaires with Directional Heads

Legend	
	Emerging Technologies
	Technology Transfer (Program Development)
	Programs & Deployment
	State Standards or Regulations
	Federal Specifications

1/11/2012

The technologies and timelines indicated on this roadmap are subject to change to reflect current conditions.



**Commercial Technology Roadmap**  
(Draft Document - For discussion purposes only)

Category	Technology	2008	2009 Q1	2009 Q2	2009 Q3	2009 Q4	2010 Q1	2010 Q2	2010 Q3	2010 Q4	2011 Q1	2011 Q2	2011 Q3	2011 Q4	2012 Q1	2012 Q2	2012 Q3	2012 Q4	2013 Q1	2013 Q2	2013 Q3	2014 Q4
ET/TT	Forklift Battery Charger	ET Assessment			TT Development																	
PROGRAMS	Forklift Battery Charger					Deployment																
C&S	Forklift Battery Charger													Title 20								
ET/TT	Data Center Economizer	ET Assessment	TT Development																			
PROGRAMS	Data Center Economizer			Deployment																		
C&S	Data Center Economizer																					
ET/TT	Thin Client		ET Assessment		TT Development																	
PROGRAMS	Thin Client					Deployment																
C&S - Fed	Thin Client																					Energy Star
ET/TT	eQuest Data Center Tool			ET Assessment		TT Development																
PROGRAMS	eQuest Data Center Tool										Deployment											
C&S	eQuest Data Center Tool																					
ET/TT	LEDs for Hospital OR				ET Assessment		TT Development															
PROGRAMS	LEDs for Hospital OR							Deployment														
C&S	LEDs for Hospital OR																					
ET/TT	Switches for Data Center					ET Assessment		TT Development														
PROGRAMS	Switches for Data Center										Deployment											
C&S	Switches for Data Center																					
ET/TT	Chilled Beam					ET Assessment		TT Development														
PROGRAMS	Chilled Beam										Deployment											
C&S	Chilled Beam																					T20
ET/TT	Fume Hood Auto Closure	ET Assessment																				
PROGRAMS	Fume Hood Auto Closure			Deployment																		
C&S	Fume Hood Auto Closure																					T-24
ET/TT	Server Power Supplies	ET Assessment	TT Development																			
PROGRAMS	Server Power Supplies			Deployment																		
C&S	Server Power Supplies																					
ET/TT	DC Power for Data Center							ET Assessment		TT Development												
PROGRAMS	DC Power for Data Center													Deployment								
C&S	DC Power for Data Center																					
ET/TT	Thermosorber Hospital										ET Assessment		TT Development									
PROGRAMS	Thermosorber Hospital													Deployment								
C&S	Thermosorber Hospital																					
ET/TT	Hotel Room Controls (Program Enhancement)	ET Assessment	TT Development																			
PROGRAMS	Hotel Room Controls (Program Enhancement)					Deployment																
C&S	Hotel Room Controls (Program Enhancement)																					CASE Study
ET/TT	Hotel Ozone Laundry (Program Enhancement)	ET Assessment	TT Development																			
PROGRAMS	Hotel Ozone Laundry (Program Enhancement)					Deployment																
C&S	Hotel Ozone Laundry (Program Enhancement)																					Green Building Stand.
ET/TT	FCI DART	ET Assessment	TT Development																			
PROGRAMS	FCI DART					Deployment																
C&S	FCI DART																					
ET/TT	Demand-based Building Controls	ET Assessment	TT Development																			
PROGRAMS	Demand-based Building Controls					Deployment																
C&S	Demand-based Building Controls																					
ET/TT	Commercial Building Energy Management Programs	ET Assessment	TT Development																			
PROGRAMS	Commercial Building Energy Management Programs					Deployment																
C&S	Commercial Building Energy Management Programs																					
ET/TT	Commercial Building Pilot		ET Assessment Phase I			TT Development			ET Assessment Phase II					TT Development								
PROGRAMS	Commercial Building Pilot							Deployment Phase I							Deployment Phase II							
C&S	Commercial Building Pilot																					
ET/TT	Building Whole Product Definition			ET Assessment Phase I		TT Development			ET Assessment Phase II					TT Development								
PROGRAMS	Building Whole Product Definition							Deployment Phase I							Deployment Phase II							
C&S	Building Whole Product Definition																					
ET/TT	ZNE Building Infrastructure Definition				ET Assessment Phase I		TT Development			ET Assessment Phase II				TT Development								
PROGRAMS	ZNE Building Infrastructure Definition													Deployment Phase I								Deployment Phase II
C&S	ZNE Building Infrastructure Definition																					

Legend	
	Emerging Technologies
	Technology Transfer (Program Development)
	Programs & Deployment
	State Standards or Regulations
	Federal Specifications



**Industrial  
Technology Roadmap  
(Draft Document - For discussion purposes only)**

Category	Technology	2008 Q4	2009 Q1	2009 Q2	2009 Q3	2009 Q4	2010 Q1	2010 Q2	2010 Q3	2010 Q4	2011 Q1	2011 Q2	2011 Q3	2011 Q4	2012 Q1	2012 Q2	
ET/TT	Forklift Battery Charger	ET Assessment		TT Development			Deployment										
PROGRAMS	Forklift Battery Charger																
C&S	Forklift Battery Charger																
ET/TT	Solar Powered Water Circulator	ET Assessment		TT Development			Deployment										
PROGRAMS	Solar Powered Water Circulator																
C&S	Solar Powered Water Circulator																
ET/TT	Microbubble Circulation & Stratification for Lagoon Wastewater Treatment	ET Assessment		TT Development			Deployment										
PROGRAMS	Microbubble Circulation & Stratification for Lagoon Wastewater Treatment																
C&S	Microbubble Circulation & Stratification for Lagoon Wastewater Treatment																
ET/TT	Oil Field Water Management	ET Assessment				TT Development			Deployment								
PROGRAMS	Oil Field Water Management																
C&S	Oil Field Water Management																
ET/TT	Super Boiler	ET Assessment					TT Development				Deployment						
PROGRAMS	Super Boiler																
C&S	Super Boiler																
ET/TT	Oil Pipeline Drag Reducing Agents	ET Assessment					TT Development				Deployment						
PROGRAMS	Oil Pipeline Drag Reducing Agents																
C&S	Oil Pipeline Drag Reducing Agents																
ET/TT	Warm Mix Asphalt	ET Assessment						TT Development				Deployment					
PROGRAMS	Warm Mix Asphalt																
C&S	Warm Mix Asphalt																

Legend	
	Emerging Technologies
	Technology Transfer (Program Development)
	Programs & Deployment
	State Standards or Regulations
	Federal Specifications

1/11/2012

The technologies and timelines indicated on this roadmap are subject to change to reflect current conditions.



**Ag Technology Roadmap**  
(Draft Document - For discussion purposes only)

Category	Technology	2008 Q4	2009 Q1	2009 Q2	2009 Q3	2009 Q4	2010 Q1	2010 Q2	2010 Q3	2010 Q4	2011 Q1	2011 Q2	2011 Q3	2011 Q4	2012 Q1	2012 Q2		
ET/TT	Forklift Battery Charger	ET Assessment		TT Development														
PROGRAMS	Forklift Battery Charger								Deployment									
C&S	Forklift Battery Charger				CEC Testing Stds													
ET/TT	Solar Powered Water Circulator	ET Assessment		TT Development														
PROGRAMS	Solar Powered Water Circulator					Deployment												
C&S	Solar Powered Water Circulator																	
ET/TT	Microbubble Circulation & Stratification for Lagoon Wastewater Treatment	ET Assessment		TT Development														
PROGRAMS	Microbubble Circulation & Stratification for Lagoon Wastewater Treatment					Deployment												
C&S	Microbubble Circulation & Stratification for Lagoon Wastewater Treatment																	
ET/TT	CO2-NH3 Cascade	ET Assessment		TT Development														
PROGRAMS	CO2-NH3 Cascade					Deployment												
C&S	CO2-NH3 Cascade								HFC Refr Phase Out								Voluntary Std	
ET/TT	Super Boiler								ET Assessment		TT Development							
PROGRAMS	Super Boiler											Deployment						
C&S	Super Boiler																	
ET/TT	Water-Energy Pilot	ET Assessment					TT Development											
PROGRAMS	Water-Energy Pilot									Deployment								
C&S	Water-Energy Pilot																	
ET/TT	Field Precooling	TT Development																
PROGRAMS	Field Precooling					Deployment												
C&S	Field Precooling																	
ET/TT	Energy Management Systems for Industry				ET Assessment				TT Development									
PROGRAMS	Energy Management Systems for Industry								Deployment									
C&S	Energy Management Systems for Industry																	
ET/TT	Thermosorber	ET Assessment			TT Development													
PROGRAMS	Thermosorber								Deployment									
C&S - Fed	Thermosorber																	
ET/TT	Gas Fired Drum Dryer				ET Assessment			TT Development										
PROGRAMS	Gas Fired Drum Dryer							Deployment										
C&S	Gas Fired Drum Dryer																	
ET/TT	Evaporative Condensers for Dairies					ET Assessment				TT Development								
PROGRAMS	Evaporative Condensers for Dairies									Deployment								
C&S	Evaporative Condensers for Dairies																	
ET/TT	Tube-In-Tube HX for Winery								ET Assessment			TT Development						
PROGRAMS	Tube-In-Tube HX for Winery											Deployment						
C&S	Tube-In-Tube HX for Winery																	

Legend	
	Emerging Technologies
	Technology Transfer (Program Development)
	Programs & Deployment
	State Standards or Regulations
	Federal Specifications

1/11/2012

The technologies and timelines indicated on this roadmap are subject to change to reflect current conditions.

Benefit Category	Ranking (manual)	Score	Qualitative Considerations in Prioritization	Strategy Summary	Timing Status	Channel (Downstream, Midstream, Upstream, 3P/GP)	Savings Opportunity (sum for 5 years)	Standards and Specifications	Technology/Product Evolution	Risks (Technology, Regulatory, etc.)
House/Envelope	1	#N/A	CEC request for Whole House Program (see Subid Wagley for more details)	Increase uptake in individual measures and improvements in non-energy related benefits (air quality, thermal comfort, safety). See CBE for values. Includes windows, insulation, HVAC, Duct Test and Seal, and Lighting	1 - Urgent	3P		Expected update in 2009 to Title-24	Movement towards ZNE CEESP Big Bold Strategy for ZNE homes (RNC) by 2020 will have potential spillover effect into existing stock.	Potential overlap with MM deemed programs
House/Appliances	2	#N/A	CEC request for Whole House Program (see Subid Wagley for more details)	Increase uptake in individual measures and improvements in non-energy related benefits (air quality, thermal comfort, safety). See CBE for values. Includes refrigerator, washer/dryer, water heater, furnace	1 - Urgent	3P		Title-20 CEC Appliance Efficiency Program ( <a href="http://www.energy.ca.gov/appliances/">http://www.energy.ca.gov/appliances/</a> )	Individual advances in each technology. Potential large changeover to create HAN in the long term	Potential overlap with MM deemed programs
Demand Response	3	#N/A		Integrate DR technologies as part of the WHP program. Potentially includes A/C cycling, smart meter, programmable thermostats, participation in demand events (CPP) Potential increase in Smart A/C signups (cross sell)	2 - Near-term	3P		None at this time, purely voluntary program.	Zig Bee Thermostat Market Ready (end of 2009 at the soonest, technology risk) No DLC Switchover planned (benefits do not outweigh the infrastructure upgrades needed)	Zig Bee development of thermostats value needs to be determined
Customer Generation	4	#N/A		Integrate CSI and other SGIP technologies into the WHP program. Includes solar installation, residential scale wind, geothermal, and net metering	2 - Near-term	#p		California Solar Initiative - budget of \$2,167 million (2007-2016) No current standard for solar/DG retrofits of existing buildings	Customer installed generation will depend on market demand and adjusted economies of scale.	Technology risk is intrinsic to many customer generation market offerings.

\*Gray boxes are automatically populated

Technology Roadmap Template: Roadmap



Category	#	Technology	2008 Q4	2009 Q1	2009 Q2	2009 Q3	2009 Q4	2010 Q1	2010 Q2	2010 Q3	2010 Q4	2011 Q1	2011 Q2	2011 Q3	2011 Q4	2012 Q1	2012 Q2	2012 Q3	2012 Q4	2013 Q1	2013 Q2	2013 Q3	2013 Q4
Other	1	House/envelope	Include existing measures/workpapers on this line (internal, Center for the Built Environment)				Coordinate with existing deemed measures																
WE&T	1	House/envelope					Plan outreach, industry education efforts																
ET/TT	1	House/envelope	Existing measures	Run cost effectiveness	Pilot (6 months)																		
C&S - State	1	House/envelope	CEC whole house program request																				
C&S - Fed	1	House/envelope																					
Other	2	House/Appliances					Coordinate with existing deemed measures																
WE&T	2	House/Appliances					Plan outreach, industry education efforts																
ET/TT	2	House/Appliances	Existing measures	Run cost effectiveness	Pilot (6 months)																		
C&S - State	2	House/Appliances	CEC whole house program request																				
C&S - Fed	2	House/Appliances																					
Other	3	Demand Response	Smart Meter Installations				Zig Bee Thermostat Market Ready/No DLC Switchover planned																
WE&T	3	Demand Response					Plan outreach, industry education efforts																
ET/TT	3	Demand Response	Identify DR/DG combined opportunities	Run cost effectiveness	Pilot (6 months)																		
C&S - State	3	Demand Response																					
C&S - Fed	3	Demand Response																					
Other	4	Customer Generation	California Solar Initiative																				
WE&T	4	Customer Generation					Plan outreach, industry education efforts																
ET/TT	4	Customer Generation	Identify DR/DG combined opportunities	Run cost effectiveness	Pilot (6 months)																		
C&S - State	4	Customer Generation																					
C&S - Fed	4	Customer Generation																					

Legend	
	Other
	Emerging Technologies
	Technology Transfer & Core Team
	Workforce Education & Training
	Programs & Deployment
	State Standards
	Federal Specifications

**Calculations in pilot should include**  
 Cost effectiveness in package form  
 Thermal comfort  
 Air quality  
 Health and Safety  
 Increase signups

**Future**  
 Integration with ZNE, green building standards

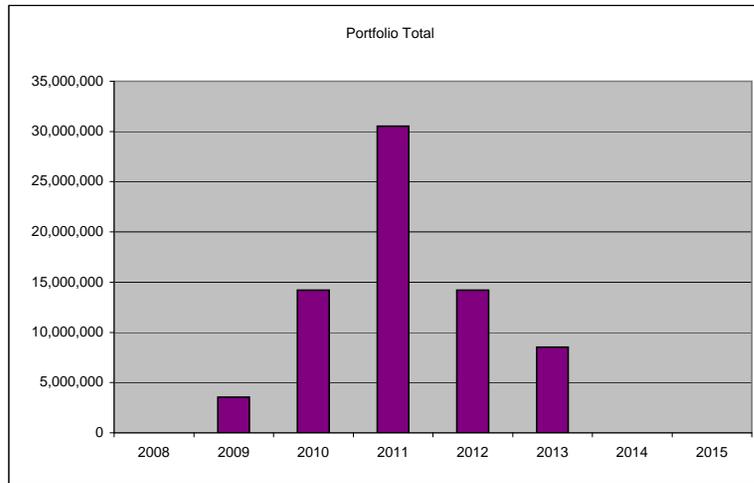
**Still Need**  
 Federal standards associated with envelope  
 ZNE development integration



Technology Roadmap Template: Energy Savings Forecast

	Program Launch Year	Market Size	Savings per unit	Total energy savings potential	Savings by year							Total	
					2008	2009	2010	2011	2012	2013	2014		2015
Cost effectiveness	2009			71,000,000	0	3,550,000	14,200,000	30,530,000	14,200,000	8,520,000	0	0	71,000,000
Thermal Comfort					0	0	0	0	0	0	0	0	0
Air Quality					0	0	0	0	0	0	0	0	0
benefits					0	0	0	0	0	0	0	0	0
installations					0	0	0	0	0	0	0	0	0
0					0	0	0	0	0	0	0	0	0
Solar Generation					0	0	0	0	0	0	0	0	0
0					0	0	0	0	0	0	0	0	0
House/Envelope					0	0	0	0	0	0	0	0	0
House/Appliances					0	0	0	0	0	0	0	0	0
Demand Response					0	0	0	0	0	0	0	0	0
Customer Generation					0	0	0	0	0	0	0	0	0
#REF!					0	0	0	0	0	0	0	0	0
#REF!					0	0	0	0	0	0	0	0	0
#REF!					0	0	0	0	0	0	0	0	0
#REF!					0	0	0	0	0	0	0	0	0
#REF!					0	0	0	0	0	0	0	0	0
#REF!					0	0	0	0	0	0	0	0	0
<b>TOTALS</b>					<b>0</b>	<b>3,550,000</b>	<b>14,200,000</b>	<b>30,530,000</b>	<b>14,200,000</b>	<b>8,520,000</b>	<b>0</b>	<b>0</b>	<b>71,000,000</b>

Market uptake multipliers  
 Year 1 0.05  
 Year 2 0.2  
 Year 3 0.43  
 Year 4 0.2  
 Year 5 0.12



\*Gray - already calculated



**HVAC Technology Roadmap**  
(Draft Document - For discussion purposes only)

Category	Technology	2008 Q4	2009 Q1	2009 Q2	2009 Q3	2009 Q4	2010 Q1	2010 Q2	2010 Q3	2010 Q4	2011 Q1	2011 Q2	2011 Q3	2011 Q4
ET/TT	Hot Dry Air Conditioner (HDAC)	TT Development					Pilot Evaluation	Deployment						
PROGRAMS	Hot Dry Air Conditioner (HDAC)				Pilot deployment									
C&S	Hot Dry Air Conditioner (HDAC)			Energy Star specs for split systems SEER 14.5/ EER 12				CPP for customers >200 kW (optional for customers <200kW)			Final rule for regional standards			
ET/TT	Onboard Diagnostics (OEM) and Retrofit Diagnostics		ET Assessment		TT Development			Deployment						
PROGRAMS	Onboard Diagnostics (OEM) and Retrofit Diagnostics													
C&S	Onboard Diagnostics (OEM) and Retrofit Diagnostics							CPP for customers >200 kW (optional for customers <200kW)						
ET/TT	Whole House Solution Evaluation													
PROGRAMS	Whole House Solution Evaluation													
C&S	Whole House Solution Evaluation							CPP for customers >200 kW (optional for customers <200kW)						
ET/TT	Indirect evaporative cooling		ET Assessment		TT Development			Deployment						
PROGRAMS	Indirect evaporative cooling													
C&S	Indirect evaporative cooling													
ET/TT	Evaporative Condenser	TT Development					Pilot Evaluation	Deployment						
PROGRAMS	Evaporative Condenser				Pilot deployment									
C&S	Evaporative Condenser			Energy Star specs for split systems SEER 14.5/ EER 12				CPP for customers >200 kW (optional for customers <200kW)			Final rule for regional standards			
ET/TT	Evaporative Cooling Systems		TT Development					Deployment						
PROGRAMS	Evaporative Cooling Systems													
C&S	Evaporative Cooling Systems							CPP for customers >200 kW (optional for customers <200kW)						
ET/TT	Hybrid Indirect Evaporative Air-Conditioner (Desert Cool Aire & Oasys)		ET Assessment		TT Development			Deployment						
PROGRAMS	Hybrid Indirect Evaporative Air-Conditioner (Desert Cool Aire & Oasys)													
C&S	Hybrid Indirect Evaporative Air-Conditioner (Desert Cool Aire & Oasys)							CPP for customers >200 kW (optional for customers <200kW)						
ET/TT	Variable speed/ high efficiency motors with time delay logic						Monitor 3P program performance							
PROGRAMS	Variable speed/ high efficiency motors with time delay logic													
C&S	Variable speed/ high efficiency motors with time delay logic													
ET/TT	Advanced Rooftop Units		Monitor Western Cooling Challenge (WCC) from WCEC			TT Development			Deployment					
PROGRAMS	Advanced Rooftop Units													
C&S	Advanced Rooftop Units													
ET/TT	Dual-fuel systems (packaged and split)						ET Assessment		TT Development		Deployment			
PROGRAMS	Dual-fuel systems (packaged and split)													
C&S	Dual-fuel systems (packaged and split)													
ET/TT	Central forced air handler with brushless permanent magnet motor			ET assessment		TT Development			Deployment					
PROGRAMS	Central forced air handler with brushless permanent magnet motor													
C&S	Central forced air handler with brushless permanent magnet motor							Title 24: Mandatory continuous ventilation for NC - ASHRAE Standard 62.2						
ET/TT	ERV/HRV						ET assessment		TT Development		Deployment			
PROGRAMS	ERV/HRV													
C&S	ERV/HRV												Title 24: Mandatory continuous ventilation for NC - ASHRAE Standard 62.2	
ET/TT	Supply only ventilation fans						ET Assessment		TT Development		Deployment			
PROGRAMS	Supply only ventilation fans													
C&S	Supply only ventilation fans												Title 24: Mandatory continuous ventilation for NC - ASHRAE Standard 62.2	
ET/TT	Geothermal Heat Pump (GHP)						ET Assessment			TT Development		Deployment		
PROGRAMS	Geothermal Heat Pump (GHP)													
C&S	Geothermal Heat Pump (GHP)			Energy Star specs for split systems SEER 14.5/ EER 12				CPP for customers >200 kW (optional for customers <200kW)			Final rule for regional standards			
ET/TT	Combined Hydronic Space Heating							ET Assessment		TT Development		Deployment		
PROGRAMS	Combined Hydronic Space Heating													
C&S	Combined Hydronic Space Heating													
ET/TT	Natural gas absorption heat pump						ET Assessment		TT Development		Deployment			
PROGRAMS	Natural gas absorption heat pump													
C&S	Natural gas absorption heat pump													
ET/TT	Desuperheaters for proximate condensers and water heaters			ET assessment		TT Development		Deployment						
PROGRAMS	Desuperheaters for proximate condensers and water heaters													
C&S	Desuperheaters for proximate condensers and water heaters													
ET/TT	Small Commercial HVAC Roof Top Units				ET Assessment		TT Development		Deployment					
PROGRAMS	Small Commercial HVAC Roof Top Units													
C&S	Small Commercial HVAC Roof Top Units								CPP for customers >200 kW (optional for customers <200kW)					
ET/TT	Variable Refrigerant Flow Systems													
PROGRAMS	Variable Refrigerant Flow Systems													
C&S	Variable Refrigerant Flow Systems								CPP for customers >200 kW (optional for customers <200kW)					
ET/TT	Mini-Split Air Conditioners													
PROGRAMS	Mini-Split Air Conditioners													
C&S	Mini-Split Air Conditioners			Energy Star specs for split systems SEER 14.5/ EER 12					Critical peak pricing (CPP) for customers >200 kW (optional for customers <200kW)			Final rule for regional standards		
ET/TT	Two-Stage Single Package Vertical Heat Pump (SPVHP)				TT Development		Deployment							
PROGRAMS	Two-Stage Single Package Vertical Heat Pump (SPVHP)													
C&S	Two-Stage Single Package Vertical Heat Pump (SPVHP)			Energy Star specs for split systems SEER 14.5/ EER 12				CPP for customers >200 kW (optional for customers <200kW)			Final rule for regional standards			
ET/TT	Dual Cool						ET Assessment		TT Development		Deployment			
PROGRAMS	Dual Cool													
C&S	Dual Cool								CPP for customers >200 kW (optional for customers <200kW)					

Legend	
<span style="background-color: #90EE90; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span>	Emerging Technologies
<span style="background-color: #ADD8E6; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span>	Technology Transfer (Program Development)
<span style="background-color: #00B0F0; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span>	Programs & Deployment
<span style="background-color: #FFD700; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span>	State Standards or Regulations
<span style="background-color: #FFA500; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span>	Federal Specifications

1/11/2012

The technologies and timelines indicated on this roadmap are subject to change to reflect current conditions.



**Business and Consumer Electronics Roadmap  
(Draft Document - For discussion purposes only)**

Category	Technology	2008 Q4	2009 Q1	2009 Q2	2009 Q3	2009 Q4	2010 Q1	2010 Q2	2010 Q3	2010 Q4	2011 Q1	2011 Q2	2011 Q3	2011 Q4	2012 Q1	2012 Q2	2012 Q3	2012 Q4	2013 Q1	2013 Q2
EI/TT Programs	TV (Commercial)	Evaluate Commercial TV use (workpaper)		Deployment		Re-evaluation of Incentive qualification levels		Re-evaluation of Incentive qualification levels		Re-evaluation of Incentive qualification levels		Re-evaluation of Incentive qualification levels		Re-evaluation of Incentive qualification levels		Re-evaluation of Incentive qualification levels		Re-evaluation of Incentive qualification levels		
C&S	TV (Commercial)	ES 3.0 Tier 1		Energy Star Tier 2 spec expected		CEC TV spec (lenient)		CEC TV spec (tight)												
EI/TT Programs	TV Update	ET Assessment		TT Development		TT Development		TT Development		TT Development		TT Development		TT Development		TT Development		TT Development		
C&S	TV Update	CA Deployment		Full Deployment		ES Tier 2 spec process starts		ES Tier 2 spec goes into effect		Tentative: CEC TV spec (lenient)										
EI/TT Programs	Monitor update	Deployment		Possible CA CE		ES 5.0 Display spec.		Possible Standard Implementation and Enforcement (depends on tentative CEC ruling)		Possible Standard Implementation and Enforcement (depends on tentative CEC ruling)		Possible Standard Implementation and Enforcement (depends on tentative CEC ruling)		Possible Standard Implementation and Enforcement (depends on tentative CEC ruling)		Possible Standard Implementation and Enforcement (depends on tentative CEC ruling)		Possible Standard Implementation and Enforcement (depends on tentative CEC ruling)		
C&S	Monitor update	C&S completed template																		
EI/TT Programs	Powersave software	TT Development		Deployment		Evaluate program performance, make C&S recommendations		Evaluate program performance, make C&S recommendations		Evaluate program performance, make C&S recommendations		Evaluate program performance, make C&S recommendations		Evaluate program performance, make C&S recommendations		Evaluate program performance, make C&S recommendations		Evaluate program performance, make C&S recommendations		
C&S	Powersave software																			
EI/TT Programs	Laptops	ET Assessment		TT Development		Deployment		ES 5.0 Computer spec goes into effect		Evaluate program performance, make C&S recommendations										
C&S	Laptops																			
EI/TT Programs	Thin Clients	ET Assessment		TT Development		Deployment		ES 5.0 Computer spec goes into effect		Evaluate program performance, make C&S recommendations										
C&S	Thin Clients																			
EI/TT Programs	Printers	ET Assessment		TT Development		Deployment		ES V1.1 Tier 2 Imaging Equipment		Evaluate program performance, make C&S recommendations										
C&S	Printers																			
EI/TT Programs	Multifunction Devices	ET Assessment		TT Development		Deployment		ES V1.1 Tier 2 Imaging Equipment		Evaluate program performance, make C&S recommendations										
C&S	Multifunction Devices																			
EI/TT Programs	Servers	ET Assessment		TT Development		Deployment		Tier 1 spec expected (enterprise servers)		Tier 2 tentative (enterprise servers)		Evaluate program performance, make C&S recommendations								
C&S	Servers																			
EI/TT Programs	DVD Players	ET Assessment		TT Development		Deployment		Audio/DVD Spec Existing Product Switchover		Evaluate & make C&S recommendations										
C&S	DVD Players																			
EI/TT Programs	Set Top Boxes	ET Assessment		TT Development		Deployment		CEC evaluation - potential integration into Title 20 in 2010 or later		STB Spec, Tier II expected		Evaluate program performance, make C&S recommendations								
C&S	Set Top Boxes																			
EI/TT Programs	Game Consoles	ET Assessment		TT Development		Deployment		ES 5.0 Computer update for Game Consoles		Evaluate program performance, make C&S recommendations										
C&S	Game Consoles																			
EI/TT Programs	Wireless Hubs/Routers/Accesspoints	ET Assessment		TT Development		Deployment		Energy Star spec. expected		Evaluate & make C&S recommendations										
C&S	Wireless Hubs/Routers/Accesspoints																			
EI/TT Programs	Internet providing modems	ET Assessment		TT Development		Deployment		Energy Star spec. expected		Evaluate & make C&S recommendations										
C&S	Internet providing modems																			
EI/TT Programs	Energy Management Systems	ET Assessment		TT Development		ET Assessment		Deployment		Evaluate program performance, make C&S recommendations										
C&S	Energy Management Systems																			
EI/TT Programs	Personal Electronic Chargers	ET Assessment		TT Development		Deployment (Tentative)		Evaluate & make C&S recommendations												
C&S	Personal Electronic Chargers																			

Legend	
	Emerging Technologies
	Technology Transfer (Program Development)
	Programs & Deployment
	State Standards or Regulations
	Federal Specifications

1/11/2012  
The technologies and timelines indicated on this roadmap are subject to change to reflect current conditions.



Gas and Pool Technology Roadmap  
(Draft for discussion purposes only)

Category	Technology	2008 Q4	2009 Q1	2009 Q2	2009 Q3	2009 Q4	2010 Q1	2010 Q2	2010 Q3	2010 Q4	2011 Q1	2011 Q2	2011 Q3	2011 Q4	2012 Q1	2012 Q2	2012 Q3	2012 Q4	2013 Q1	2013 Q2	2013 Q3	2014 Q4	
ET/TT	Res Water Htg Condensing Products (eg. Tankless, Tank < 75 gals)		TT Development																				
PROGRAMS	Res Water Htg Condensing Products (eg. Tankless, Tank < 75 gals)					Deployment																	
C&S	Res Water Htg Condensing Products (eg. Tankless, Tank < 75 gals)		Energy Star to label wtr htrs with same tier info as PG&E																		Res. WH: New Fed Rule due in 2010, effective in 2013		
ET/TT	Com'l High Efficiency and Food Svc Water Heating	ET Assessment					TT Development																
PROGRAMS	Com'l High Efficiency and Food Svc Water Heating									Deployment													
C&S	Com'l High Efficiency and Food Svc Water Heating																						
ET/TT	Phase II - Res Combined Hydronic Water Heating				ET Assessment			TT Development															
PROGRAMS	Phase II - Res Combined Hydronic Water Heating																						
C&S	Phase II - Res Combined Hydronic Water Heating																						
ET/TT	Res & Com'l Heat Pump (Elec water heater)					ET Assessment				TT Development													
PROGRAMS	Res & Com'l Heat Pump (Elec water heater)																						
C&S	Res & Com'l Heat Pump (Elec water heater)		Energy Star specs effective Q1 2009																			Res. WH: New Fed Rule due in 2010, effective in 2013	
ET/TT	Refrigerant heat recovery from walk-in refrigeration (for service water preheating).				ET Assessment			TT Development															
PROGRAMS	Refrigerant heat recovery from walk-in refrigeration (for service water preheating).																						
C&S	Refrigerant heat recovery from walk-in refrigeration (for service water preheating).																						
ET/TT	Feasibility Study - Res Fully Condensing Storage Wtr Htr Prototype, < 75 gals				ET Assessment					TT Development													
PROGRAMS	Feasibility Study - Res Fully Condensing Storage Wtr Htr Prototype, < 75 gals																						
C&S	Feasibility Study - Res Fully Condensing Storage Wtr Htr Prototype, < 75 gals																					Res. WH: New Fed Rule due in 2010, effective in 2013	
ET/TT	Retro-Commissioning Com'l Wtr Htg Storage - Food Svc	ET Assessment	TT Development																				
PROGRAMS	Retro-Commissioning Com'l Wtr Htg Storage - Food Svc																						
C&S	Retro-Commissioning Com'l Wtr Htg Storage - Food Svc																						
ET/TT	Commercial Food Service - Gas Under-fired Broiler							ET Assessment	TT Development														
PROGRAMS	Commercial Food Service - Gas Under-fired Broiler																						
C&S	Commercial Food Service - Gas Under-fired Broiler																						
ET/TT	Energy Star Rebate for Commercial Dishwashers					TT Development																	
PROGRAMS	Energy Star Rebate for Commercial Dishwashers																						
C&S	Energy Star Rebate for Commercial Dishwashers																						
ET/TT	Low Flow Showerhead for Multifamily Customers		TT Development																				
PROGRAMS	Low Flow Showerhead for Multifamily Customers																						
C&S	Low Flow Showerhead for Multifamily Customers																						
ET/TT	Com'l & Res Demand Hot Water Recirculation Systems				ET Assessment				TT Development														
PROGRAMS	Com'l & Res Demand Hot Water Recirculation Systems																						
C&S	Com'l & Res Demand Hot Water Recirculation Systems																					Sempra T-24	
ET/TT	Rebate for Insulation on Large-Diameter Pipes		TT Development																				
PROGRAMS	Rebate for Insulation on Large-Diameter Pipes																						
C&S	Rebate for Insulation on Large-Diameter Pipes																						
ET/TT	Res Portable Electric Spas									TT Development													
PROGRAMS	Res Portable Electric Spas																						
C&S	Res Portable Electric Spas																					T-20 standard probable for res Portable Elec spa covers T-20 upgrade possible for res Port Elec spa covers as a result of test and list data. 2013 might be more realistic	
ET/TT	Res Motor for Pools - Booster Pumps						TT Development																
PROGRAMS	Res Motor for Pools - Booster Pumps																						
C&S	Res Motor for Pools - Booster Pumps																						
ET/TT	Phase II - Res Motors for Above Ground Pools																					TT Development	
PROGRAMS	Phase II - Res Motors for Above Ground Pools																						Deployment
C&S	Phase II - Res Motors for Above Ground Pools																						T-20 Pool pump motors standard (clarified rule) takes effect for motors and pump motor combinations that equal or exceed 1 HP--possible overlap
ET/TT	Com'l Pool LED Lighting								TT Development														
PROGRAMS	Com'l Pool LED Lighting																						
C&S	Com'l Pool LED Lighting																						
ET/TT	Com'l Food Svc Low Flow Spray Rinse Valve < 1 gpm																						
PROGRAMS	Com'l Food Svc Low Flow Spray Rinse Valve < 1 gpm																						
C&S	Com'l Food Svc Low Flow Spray Rinse Valve < 1 gpm																						Updated standard not due from DOE until 2013, effective in 2016.
ET/TT	Natural gas absorption heat pump							ET Assessment	TT Development														
PROGRAMS	Natural gas absorption heat pump																						
C&S	Natural gas absorption heat pump																						
ET/TT	Com'l Range burner electronic ignition		ET Assessment		TT Development																		
PROGRAMS	Com'l Range burner electronic ignition																						
C&S	Com'l Range burner electronic ignition																						

Legend	
	Emerging Technologies
	Technology Transfer (Program Development)
	Programs & Deployment
	State Standards or Regulations
	Federal Specifications

1/11/2012

The technologies and timelines indicated on this roadmap are subject to change to reflect current conditions.

**PG&E Gas and Electric  
Advice Filing List  
General Order 96-B, Section IV**

AT&T	Department of Water Resources	North America Power Partners
Alcantar & Kahl LLP	Dept of General Services	North Coast SolarResources
Ameresco	Douglass & Liddell	Occidental Energy Marketing, Inc.
Anderson & Poole	Downey & Brand	OnGrid Solar
BART	Duke Energy	Praxair
Barkovich & Yap, Inc.	Economic Sciences Corporation	R. W. Beck & Associates
Bartle Wells Associates	Ellison Schneider & Harris LLP	RCS, Inc.
Bloomberg	Foster Farms	Recurrent Energy
Bloomberg New Energy Finance	G. A. Krause & Assoc.	SCD Energy Solutions
Boston Properties	GLJ Publications	SCE
Braun Blaising McLaughlin, P.C.	GenOn Energy, Inc.	SMUD
Brookfield Renewable Power	Goodin, MacBride, Squeri, Schlotz & Ritchie	SPURR
CA Bldg Industry Association	Green Power Institute	San Francisco Public Utilities Commission
CLECA Law Office	Hanna & Morton	Seattle City Light
CSC Energy Services	Hitachi	Sempra Utilities
California Cotton Ginners & Growers Assn	In House Energy	Sierra Pacific Power Company
California Energy Commission	International Power Technology	Silicon Valley Power
California League of Food Processors	Intestate Gas Services, Inc.	Silo Energy LLC
California Public Utilities Commission	Lawrence Berkeley National Lab	Southern California Edison Company
Calpine	Los Angeles Dept of Water & Power	Spark Energy, L.P.
Casner, Steve	Luce, Forward, Hamilton & Scripps LLP	Sun Light & Power
Center for Biological Diversity	MAC Lighting Consulting	Sunshine Design
Chris, King	MBMC, Inc.	Sutherland, Asbill & Brennan
City of Palo Alto	MRW & Associates	Tabors Caramanis & Associates
City of Palo Alto Utilities	Manatt Phelps Phillips	Tecogen, Inc.
City of San Jose	McKenzie & Associates	Tiger Natural Gas, Inc.
City of Santa Rosa	Merced Irrigation District	TransCanada
Clean Energy Fuels	Modesto Irrigation District	Turlock Irrigation District
Coast Economic Consulting	Morgan Stanley	United Cogen
Commercial Energy	Morrison & Foerster	Utility Cost Management
Consumer Federation of California	NLine Energy, Inc.	Utility Specialists
Crossborder Energy	NRG West	Verizon
Davis Wright Tremaine LLP	NaturEner	Wellhead Electric Company
Day Carter Murphy	Navigant Consulting	Western Manufactured Housing Communities Association (WMA)
Defense Energy Support Center	Norris & Wong Associates	eMeter Corporation