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# **ATTACHMENT A**

## **PROPOSED CHANGES TO UTILITY ENERGY EFFICIENCY PORTFOLIOS FOR THE 2013-2014 TRANSITION PERIOD**

**PROPOSED CHANGES TO  
UTILITY ENERGY EFFICIENCY PORTFOLIOS  
FOR THE 2013-2014 TRANSITION PERIOD**

**Prepared by  
ENERGY DIVISION**

**November 28, 2011**

## **Introduction**

At the request of the Assigned Commissioner's office, Energy Division staff has developed the following "straw proposal" recommendations for improving the current Investor-Owned Utility (IOU) Energy Efficiency portfolios in the 2013-2014 period and beyond.

The recommendations target the following five sectors/programs, which track with the five sections of this document:

- Residential Programs (Section I)
- Commercial Programs (Section II)
- Lighting Programs (Section III)
- Codes and Standards (Section IV)
- Emerging Technologies Programs (Section V)

This document also contains three appendices that elaborate on some of the recommendations provided in the Residential Programs section:

1. Residential Retrofit Programs
2. Residential New Construction
3. Plug Load and Appliances Program

## Section I: Residential Programs

### 1. Description of Current Programs

The Statewide (SW) Program for Residential Energy Efficiency (known as “SPREE” as per Commission D.09-09-047) aims to maximize short and long term energy efficiency savings from the residential sector via upstream, midstream and downstream incentive programs for high efficiency appliances; rebates for contractor installation of approved measures; and refrigerator recycling. The SPREE program is aimed at both single family (SF) and multi-family (MF) residences; the “Multifamily Energy Efficiency Rebate” (MFEER) Program currently serves the MF building segment.

The IOUs also operate additional local (IOU-specific) and third party residential programs. PG&E has, and SDG&E is launching, a “Middle Income Direct Install” (MIDI) program that offers free direct installation of efficiency measures for households that just exceed income qualification levels for the Energy Savings Assistance Program (ESAP). SCG offers several third-party gas savings programs aimed at specific market sectors. SCE is launching an Online Buyers Guide (OBG) by the end of 2012; OBG activities will be expanded to all IOUs in 2013. The IOUs currently include Basic CFL and Advanced Lighting subprograms in the SPREE.

In addition, the CPUC has directed the IOUs to establish a statewide “whole house” comprehensive energy upgrade program (which the IOUs are in the process of expanding to include MF buildings), now known as “Energy Upgrade California (EUC), which is being administered in collaboration with the California Energy Commission (Energy Commission) and its American Restoration and Recovery Act (ARRA) grantees and partners. Under legislative direction (AB 758 – Skinner, 2009), the Energy Commission has established the EUC as a comprehensive residential and non-residential retrofit program including relevant training, financing, marketing, building rating and labeling activities. The EUC also forms the foundation for implementation of ABx 1 14 (Skinner, 2011), which directs the Energy Commission to design – and the California Alternative Energy and Advanced Transportation Financing Administration (CAEATFA) to develop – a Clean Energy Upgrade (CEU) loan loss reserve program aimed primarily at the residential sector. The CAEATFA Clean Energy Upgrade program will be launched in early 2012 and is expected to leverage up to \$250 million in private capital for comprehensive whole house upgrades, renewable energy installations, electric vehicle charging stations and home water improvements. It is also may provide reduced interest rate financing for high-efficiency large appliances (air conditioners, furnaces, windows, and possible smaller high efficiency appliances such as refrigerators and clothes washers).

### 2. Current Program Data

The SPREE program currently includes the eight programs shown below and the IOU’s local and Third Party programs.

**Table I-1: Current Residential Programs and Budgets**

<b>Program</b>	<b>Total Statewide (SPREE) Budget</b>	<b>% of budget</b>	<b>% Total Res Budget</b>
Home Energy Efficiency Surveys	32,396,994	5%	

Basic CFLs	75,006,596	12%	
Advanced Lighting	\$82,505,514	13%	
Home Energy Efficiency Rebates	141,851,188	22%	
Appliance Recycling	67,784,646	11%	
Business and Consumer Electronics	45,226,820	7%	
Multifamily Rebates	80,188,539	13%	
Whole House (Energy Upgrade CA)	110,907,982	17%	
<b>Total SW SPREE budget</b>	<b>635,868,279</b>		<b>88%</b>
	<b>Non-SW budget</b>	<b>% of budget</b>	
Additional Local Res programs	19,812,787	23%	
Third Party Residential Programs	67,642,615	77%	
<b>Total non-SW Res programs</b>	<b>87,455,402</b>		<b>12%</b>
<b>Total Residential budget</b>	<b>723,323,681</b>		<b>100%</b>

Source: 2010-2012 Residential EE Program Fact Sheet

The residential sector represents approximately 32% of total state electricity consumption and 36% of its total natural gas consumption. Statewide Non-Coincident Peak Demand Per Capita (includes households/businesses) is projected to hold steady at about 1.6 KW/person from 2010-2020.

**Table I-2: Residential Sector Electricity Consumption & Demand (2011-2012)**

Year	Residential sector consumption (GWh/year)	Residential sector demand (MW)	Total Therm demand (all CA end users except power generators) MM Therms
2011	91,500	25,000	12,162 (2010)
2020	109,000	30,000	12,900 (2018)

Source: “California Energy Demand, Commission Adopted Forecast, 2010-2020,” Energy Commission (2009).

Average household energy consumption levels decreased 18% on average for natural gas between 2003 and 2008, but rose an average of 6% for electricity (RASS 2010).

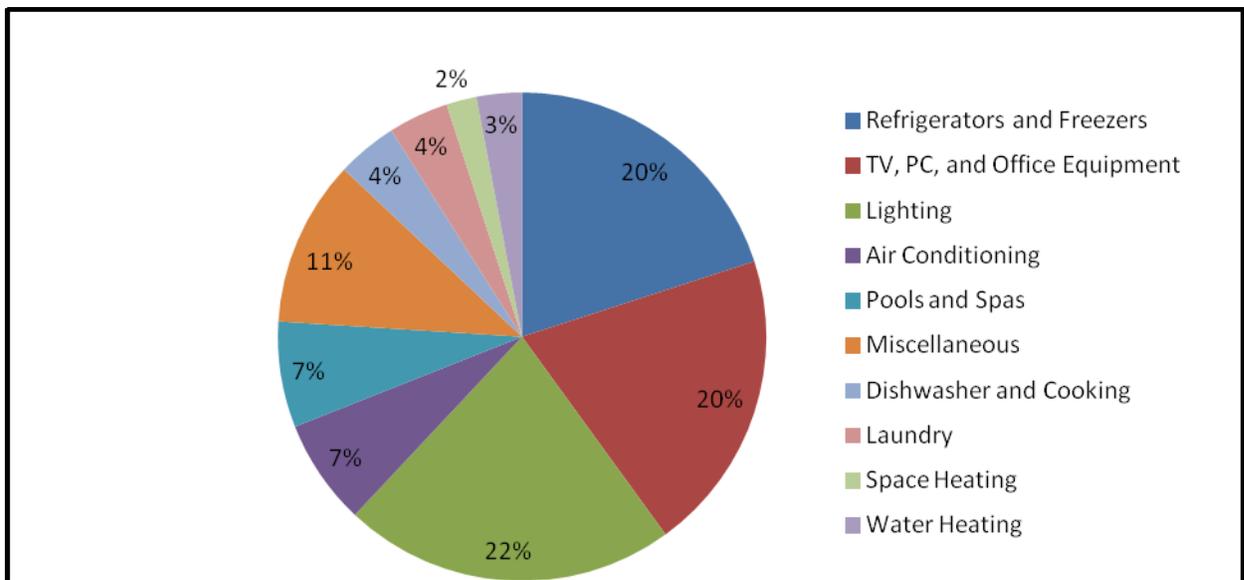
**Table I-3: Average Household Consumption Levels**

	Average electricity consumption (2008) KWh/year	Percent of CA population	2010-2012 Program Savings by Bldg type (2010 to date)	Average electricity consumption (2003) KWh/year	Average Percentage change in per household consumption 2003-2008
<b>All households</b>	6,296			5,914	6% increase
<b>Single family</b>	7,605	63%	92%		
<b>Multifamily</b>	3,929	34%	7%		

	Average gas consumption (2008) therms	Percent of CA population	2010-2012 Program Savings by Bldg type (2010 to date)	Average gas consumption (2003) KWh/year	Average Percentage change in per household consumption 2003-2008
<b>All households</b>	354			431	18% decrease
<b>Single family</b>	425	63%	53%		
<b>Multifamily</b>	198	34%	43%		

Source: Residential Appliance Saturation Study (RASS) 2010; Energy Efficiency Groupware Application (EEGA) 2010- 2012 programs.

**Figure I-1: Average End Use Electricity Consumption per Household (2008)**



Source: RASS 2010

### 3. Market Challenges

The California Long Term Energy Efficiency Strategic Plan (CEESP) set out ambitious energy use reduction targets for the residential sector by 2020-- that all California homes reduce energy drawn from the grid by 40% by that time. At the same time, the energy efficiency savings potential from two current SPREE subprograms – Basic CFLs and Appliance Recycling – has dramatically declined with market changes and the onset of the Huffman Bill’s California lighting standard. In addition, Energy Division’s draft potential study (developed by Navigant Consulting, Inc.) indicates declining efficiency potential from many IOU appliance and consumer electronics programs as the technical specifications promoted by those programs are moved into Title 20 (and 24) starting in 2014. Quality HVAC maintenance and the installation of high efficiency HVAC units show great potential for KW savings starting in 2014, but are not currently “cost-effective.” Finally, the high-profile, CPUC-CEC jointly administered Energy Upgrade California “whole house” program has raised contractor and other stakeholder expectations for a long term (5-10 year) agency commitment to justify their equipment and staffing investments. With substantial input of funds and effort from American Recovery and

Reinvestment Act (ARRA) activities in California, the 2010-2011 EUC has become the main residential market transformation (MT) program driver for the CEESP 2020 existing building deep energy savings goals.

The SPREE program is very complex and does not fully distinguish between short term (resource acquisition) programs and longer term market transformation (MT) programs aimed at significantly altering the structure and function of residential energy use in line with the desired goal results of the CEESP. The CEESP sets out the aspirational target of a 40% reduction in energy demand from the grid for all California residences by 2020, with 75% of residences decreasing energy drawn from the grid by 30% and 25% decreasing energy use by 70% (CEESP, pg. 20). SPREE also does not currently clearly indicate criteria for ending ratepayer support for a given measure or delivery mechanism.

In addition, EUC expenditures to date are lagging due to time delays in program ramp up. As of November, 2011 the EUC had 2,500 jobs completed or underway in the ten months since its launch (a rate that exceeds that of the California Solar Initiative in its first year); however, some market actors remain dissatisfied with the program. Although concerns vary, contractors desire greater streamlining of program application, review, approval and quality assurance procedures, higher and limited time-offer incentives, and access to reduced interest rate financing; though emergency replacements of air conditioning, furnace, water heater or other large appliances are ideal moments to “upsell” homeowners to a full home energy upgrade, so far heating, ventilation and air conditioning (HVAC) contractors have not moved *en masse* to gain the credentials necessary to participate in the EUC, and; ratepayer advocates would like to see greater amounts of program funds expended towards moderate income and MF dwellings.

#### **4. Proposed Changes to Program Delivery / Market Coordination**

Energy Division recommends the six revisions to the current SPREE programs summarized in this section and depicted in the figure below.

*Note: The CPUC uses a Total Resource Cost (TRC) test to assess total IOU EE portfolio cost effectiveness. The TRC estimates above are based on the IOUs' 2010-2012 compliance filings. Actual program TRCs will vary.*

- A) **Existing Whole Building (Energy Upgrade California) Program:** The 2013-2014 portfolio approval process should articulate a long term (5 - 10 year) commitment to EUC as a residential market transformation program supporting movement towards deep (20% - 40%) energy savings in California homes by 2020 and in concert with new AB x 1 14-related (and future CPUC-funded) EE financing.

As early as 2012 and into the 2013-2014 period, Energy Division recommends that the EUC program begin testing new approaches to drive consumer demand for whole house energy upgrades and to alter the behavior of market actors. The EUC would test new incentive, outreach and building disclosure approaches as a foundation to AB758 and would dramatically ramp up its emphasis on engaging HVAC contractors. Further, Energy Division expects that a statewide MF component of the EUC will be fully launched by the end of 2012, building on the current SDG&E MF EUC Pilot, and that all IOUs will have launched a MIDI component of EUC by the end of 2012.

The proposed new SPREE structure emphasizes aligning prescriptive and single measure whole building approaches (current Basic Path EUC component and the MFEER) across market segments and emphasizing them as moderately priced pathways towards full whole building performance approaches. In 2013, the existing single family EUC prescriptive pathway should be reviewed to increase its attractiveness to lower income homeowners. *In-home* customer outreach audits, now funded via the Home Energy Efficiency Survey (HEES) program, would become subsumed within the EUC as a customer outreach method. (The various components of this proposal are further elaborated upon in Appendix 1.)

- B) **Whole Building New Construction Program:** This continues the California Advanced Homes Program with a more explicit acknowledgement of this as a MT program aimed at driving towards California's adoption of Title 24 standards in 2020 that meet Zero Net Energy (ZNE) requirements. A revised 2013-2014 SPREE structure should emphasize the relationship of the California Advanced Home new construction program to the Energy Upgrade California existing whole house program. It should also emphasize the need for both to drive quality installation of newly emerging, more efficient technologies as well as ensure sufficient training for contractors, technicians and others in the home performance and new construction fields. (The various components of this proposal are further elaborated upon in Appendix 2.)

- C) **Plug Loads/Appliances Program:** This new SPREE program activity would combine all plug load and appliance activities in the current structure (Business and Consumer Electronics, Home Energy Efficiency Rebates, updated program elements from the current Appliance Recycling Program) into one integrated program with the following objectives:
- i. Maximizing short term energy savings via subsidies for plug load/appliance measures, with an emphasis on moving as many subsidies as feasible upstream to manufacturers in order to reduce administrative costs and leverage retailer relationships;
  - ii. Strategically moving technology advances from the program into Title 20 and Title 24 codes as quickly as possible;
  - iii. Considering short term consumer engagement strategies with limited time rebate offers to drive consumer awareness and uptake; and
  - iv. Integrating recycling activities with other program elements.

(The various components of this proposal are further elaborated upon in Appendix 3.)

- D) **Residential Customer Education and Behavior Change Team:** Energy Division proposes that the IOUs establish a new SPREE program element to implement existing residential behavior change approaches (OPOWER comparative energy use pilots, for example) and to undertake research necessary to expand such approaches in the residential sector in 2013 and beyond. This program element would also manage the IOUs existing online, integrated home energy survey service and coordinate customer engagement strategies (marketing and outreach) for all SPREE activities towards two aims: 1) ensure that all program messaging utilizes up-to-date behavioral science insights; and, 2) identify strategic, short term SPREE marketing emphases and coordinate these with any statewide marketing and outreach effort.

In response to D.09-09-047, PG&E has initiated a 60,000 person comparative energy use report pilot; PG&E has also made additional changes to its online energy reports and interface. In 2011-2012 evaluation teams will assess the level and persistence of energy savings from the comparative energy use pilot with results due in late 2012. If successful, this pilot should be considered for expansion across IOUs and service territories in 2013-2014.

Other market actors have developed a range of innovative “behavior change” online tools and programs in recent years. Additional behavioral change approaches merit consideration for integration into ongoing efforts during 2013-2014, for launch in 2015-2017. Behavioral pilots could be implemented by third parties, and their selection should be undertaken in a process overseen by Energy Division staff and non-financially interested stakeholders.

To this end, we propose development of a new Customer Education and Behavior Change Team or program element that would also be accountable for ensuring that residential marketing campaigns are based on the latest EE behavioral science about what techniques best drive customer awareness, knowledge and action. Energy Division believes that about one third of any statewide marketing budget should be allocated towards priority residential areas, which in 2013-2014 might include the Energy Upgrade CA program, HVAC, appliances, and codes and standards compliance.

- E) **Residential Market Transformation and Research Team:** Energy Division proposes the development of a cross-cutting SPREE team that would ensure the strategic, efficient movement of emerging technologies from the Emerging Technologies Program (ETP), into the SPREE programs (Plug Loads, Energy Upgrade California, and California Advanced Homes), and then into the Title 24 and Title 20 Codes and Standards (C&S) programs, as quickly as possible. It would also manage research to improve SPREE, in particular the Energy Upgrade California program, via the Experimental Design techniques specifically required to be applied to improve whole house programs in D.10-10-033. Some of the incentive design suggestions above may be appropriate to test for their relative effectiveness in driving customer participation with an Experimental Design approach.
- F) **Residential EE Program Workforce Training.** Since the residential sector consumes one- third of California's electricity, about one third of ratepayer funded workforce, education and training (WE&T) budgets should logically be allocated to programs strategically designed to advance the state's residential energy efficiency goals. Primary recommendations from the WE&T Needs Assessment relevant to the residential sector was for the reorientation of WE&T program budgets to focus on integrated sector strategies and training that culminates in skills assessment tests (written and in the field), certifications, and on-going apprenticeship and mentoring opportunities.

## Section II: Commercial Programs

### 1. Description of Current Programs

- a. **Non-Residential Audits (NRA)** – Nonresidential Audits provide Savings Calculation Assistance (SCA), targeted to specific end uses and systems, to support a seamless customer experience. Nonresidential Audits, including basic audits, Integrated Audits, and Retro Commissioning (RCX) audits, provide an inventory of technical project opportunities and financial analysis information that can be used to inform a customer’s short/long-term energy plan. NRA is usually the first point of contact with a customer and the main feeder into other IOU incentive, non-IOU programs and/or finance programs.
- b. **Deemed Incentives** – This program provides rebate offerings through fixed incentive amounts per unit/measure. This rebate offering provides utility representatives, equipment vendors, and customers an easy-to-use mechanism to cost-effectively subsidize and encourage adoption of mass market efficiency measures. This program has a large focus on lighting measures.
- c. **Calculated Incentives** – This sub-program is utilized for projects where a rebate is not available through the statewide Deemed program, where project conditions require customized calculations to provide the most accurate savings estimates, or where a project has interactive effects that are best captured through whole building or whole system modeling.<sup>1</sup> Estimates are based on actual customer operating conditions, pre-inspections (for retrofit projects) and post-inspections.
- d. **Direct Install** – This sub-program provides no/low cost rebate to retrofit existing systems for small business customers that have a small peak demand. Third-party contractors are involved in the retrofitting of existing systems.
- e. **Continuous Energy Improvement** - This non-resource program focuses on long-term goal setting through analysis, benchmarking, project implementation support, performance monitoring, and ultimately energy management certification. Focus is on strategic planning tools and resources which lay the groundwork for integrated energy planning and serve as a launching platform for other utility and non-utility programs and services. This approach requires involvement and commitment from top level executives.
- f. **Third Party Programs** - Third-party program are intended to pilot innovative approaches for targeted customers and are designed and administered outside of the standard IOU statewide programs. These programs target niche markets in lighting,

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<sup>1</sup> <http://eega.cpuc.ca.gov/Main2010PIPs.aspx>.u8

HVAC controls, schools, retail, healthcare, grocery stores, office buildings, lodging and hospitality etc.

## 2. Current Program Data

- a. **Non-Residential Audits (NRA)** – Budget: \$34 M; Energy Savings (GWh): 95,938,717; Demand Gross Peak (MW): 21,658; Gas Savings (Therms): 2,010,636.
- b. **Deemed Incentives** – Budget: \$143.5 M; Energy Savings (GWh): 1,026,714,735; Demand Gross Peak (MW): 221,876; Gas Savings (Therms): 12,168,014.
- c. **Calculated Incentives** – Budget: \$141.5 M; Energy Savings (GWh): 385,834,990; Demand Gross Peak (MW): 60,012; Gas Savings (Therms): 5,813,650.
- d. **Direct Install** – Budget: \$125 M; Energy Savings (GWh): 284,392,355; Demand Gross Peak (MW): 59,846; Gas Savings (Therms): (19,865).
- e. **Continuous Energy Improvement** – Budget: \$ 9.9 M; (There are no savings since this is a non-resource program).
- f. **Third Party Programs** – Budget: \$387 M; Energy Savings (GWh): 1,014,986,220; Demand Gross Peak (MW): 214,365; Gas Savings (Therms): 14,823,384.

## 3. Market Challenges

- a. **Small commercial buildings are an underserved market segment in utility territories.** Recent program performance metric (PPMs) reports acknowledge the difficulty of reaching small commercial customers in the various IOU territories. According to SDG&E's performance metric reports, 96% of commercial buildings are small customers (< 200 kW), and of these customers 0-2% of these buildings are being engaged through statewide programs.<sup>2</sup> Similarly, 98% of the commercial customers in SCE's territory have a demand of less than 200 kW, and <1% are being funneled into the Non-Residential Audit, Deemed and Calculated Programs.<sup>3</sup>
- b. **The percent of emerging technologies (ET) installed into the deemed and calculated statewide program is between 1-14%<sup>4</sup> and needs to increase for the projected market penetration suggested in Navigant's Draft Potential Study.** Navigant's draft study attributes the majority of potential energy savings in commercial buildings to upcoming codes and standards changes, and the introduction

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<sup>2</sup> SDG&E Program Performance Metric Reporting Spreadsheet. <http://eega.cpuc.ca.gov/ReportsAnnual.aspx>.

<sup>3</sup> SCE Program performance Metric Reporting Spreadsheet. These numbers are exclusive of on-line audits, since these are harder to track. <http://eega.cpuc.ca.gov/ReportsAnnual.aspx>.

<sup>4</sup> IOU Program Performance Metric Reporting Spreadsheet. <http://eega.cpuc.ca.gov/ReportsAnnual.aspx>.

of ETs. Starting in 2013 ETs become a significant contributor to energy savings potential, and their contribution increases with time.<sup>5</sup>

- c. **Certain market barriers continue to prevent the adoption of energy efficiency in commercial properties.** Predominant barriers include: leased building spaces being hard to reach, lack of understanding of long term energy planning, lack of plug load management, and limited education of facility managers and building operators about energy management systems and retro-commissioning.
- d. **Performance data for energy efficiency projects in commercial buildings is not readily available and is needed to both verify energy savings post installation and leverage additional investment for commercial building projects.**
- e. **Deeper energy retrofit projects are not widespread in statewide programs,** as the primary approach is energy savings through high impact measure replacement. Additionally, plug loads are becoming a large part of a building energy use and strategic management of these loads needs to be priority.
- f. **Split-incentives in leased owner occupied buildings represent a huge barrier to energy efficiency.** Owners have little incentive to upgrade equipment in their building when they do not receive the benefit of lowered utility bills.

#### 4. Recommendations for Existing Commercial Programs

- a. **Small commercial buildings are an underserved market segment in utility territories.**
  - i. The Direct Install program should increase coordination with Local Government Partnerships and Business Improvement Districts<sup>6</sup> to increase participation of mom and pop and hard to reach customers.<sup>7</sup>
  - ii. Acceptance of rebates in the small business market should include a commitment to an audit. IOUs need to utilize all customer engagement opportunities to educate and recommend energy savings measures.
  - iii. Utilize the Energy Smart Jobs model used in American Recovery Reinvestment Act (ARRA) projects for outreach to the small business market. This could also be a good platform for pilots of the Building Energy Asset Rating System (BEARS).<sup>8</sup>

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<sup>5</sup>ANALYSIS TO UPDATE ENERGY EFFICIENCY POTENTIAL, GOALS AND TARGETS FOR 2013 AND BEYOND TRACK 1 ECONOMIC POTENTIAL STUDY. PAGE 100. [HTTP://WWW.CPUC.CA.GOV/NR/RDONLYRES/7C233849-9726-497D-A60D-FE84A057591A/0/POTENTIALGOALSANDTARGETSSTUDYTRACK1DRAFTREPORT20111108.PDF](http://www.cpuc.ca.gov/NR/rdonlyres/7C233849-9726-497D-A60D-FE84A057591A/0/POTENTIALGOALSANDTARGETSSTUDYTRACK1DRAFTREPORT20111108.PDF).

<sup>6</sup><http://www.coolcalifornia.org/article/energy-makeover>.

<sup>7</sup>The Energy Smart Jobs (ESJ) model used in the ARRA projects would be ideal for this type of outreach. If utilized, it could also be a good platform for BEARS piloting.

<sup>8</sup>[http://www.energy.ca.gov/ab758/documents/AB\\_758\\_Technical\\_Support\\_Contract\\_Scope\\_of\\_Work.pdf](http://www.energy.ca.gov/ab758/documents/AB_758_Technical_Support_Contract_Scope_of_Work.pdf).

- iv. Programs addressing small businesses in tenant leased space, should facilitate the owner's participation to compile a participant "toolkit" with tenant outreach materials, FAQ sheets, phone numbers, and etc.
- b. Increase the percent of emerging technologies (ET) installed into the deemed and calculated statewide program.**
  - i. Deemed and Calculated programs should incorporate, where appropriate for real world applicability, measures identified in the Appendix of Navigant's DRAFT Potential Study that have the highest ex-post savings potential for the following areas: Food Service, Indoor lighting, Exterior lighting, HVAC, Refrigeration, Plug Load, and Process. Some of these measures include:
    - a. Ps Interior HID – Incandescent Base  $\leq$ 150W
    - b. Dimmable w/F32 t8 & 5W standby CFL lamps
    - c. Combination Oven
    - d. PS interior HID – Incandescent Base  $>$ 150W
    - e. High bay fluorescent
    - f. Fault Detection & Diagnostics
    - g. PS Interior HID- Mercury Vapor Base
    - h. Variable Refrigerant Flow (VRF) Chiller
    - i. PS Exterior HID – Mercury Vapor Base
    - j. Second Generation T8 – 4ft
  - ii. IOUs should investigate ways to increase the uptake of ETs into statewide programs.
  - iii. Include advanced lighting technologies as identified in the lighting market transformation program and significantly reduce if not eliminate the use of CFL lamps in down lighting applications, as LED's provide better down lighting options.
  - iv. Combine the lighting components of the residential and non-residential sectors as part of one overarching lighting program (as discussed earlier in Energy Division's Lighting Programs proposal).
- c. Expand Successful Third Party Programs.**

Due to the complexities of expanding third party contracts and being sensitive to the timing of the 2013-2014 funding period, we welcome proposals for expansion of

third party programs. These third party programs should provide cost-effective savings and address significant market barriers as noted in Section B.

**d. Increasing measured performance data by building in SW and Third Party Programs.**

- i. The measure specific results from the calculated projects program should be shared with the DOE's Building Performance Database program.
- ii. Create case studies based on measured performance for calculated retrofit project that target owner-occupied and multi-tenant buildings.<sup>9</sup> In order to maximize the outreach impact of the case studies, they should clearly state the criterion that needs to be satisfied in order to be considered for this kind of project.
- iii. Incorporate better modeling tools for pre and post measured savings. Investigate EnergyPlus or other free modeling tools.
- iv. Provide incentives for plug load technologies and sub-metering.<sup>10</sup>

**e. Deeper energy retrofit projects in statewide programs<sup>11</sup>**

- i. Ensure that funding mechanisms are taking into consideration an owner's capital to implement, and are presented to the customer in a cost-effective model.
- ii. Upon the acceptance of rebates in the direct install and deemed program, customers must commit to an audit as part of the program.
- iii. Basic Audits should eliminate proposals that are limited to a single piece of equipment and present (at first contact) a package of measures that will calculate projected energy savings and positive cash flow for multiple cost scenarios. Packages of measures, at minimum, should include a range of one measure from each of the following categories: 1) climate controls and equipment 2) insulation/thermal envelope, and 3) advanced lighting technologies.
- iv. Leverage basic audits to gather as much information as possible prior to initiating walk-through audits and RCx audits. This process can also be used to pilot the Building Energy Asset Rating System (BEARS) program. Audits should be tailored to specific market segments and building construction vintages. A package of measures common to each segment should be generated in order to avoid having to recalculate savings for each additional site. Potential strategies could include pre-populating this information into tablet computers that the NRA auditors use to record site information.

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<sup>9</sup>[http://www.newbuildings.org/sites/default/files/NBI\\_DSEB\\_webinar\\_higgins\\_June2011\\_0.pdf](http://www.newbuildings.org/sites/default/files/NBI_DSEB_webinar_higgins_June2011_0.pdf).

<sup>10</sup>[http://www.newbuildings.org/sites/default/files/110712\\_NBI\\_Sensitivity\\_Report\\_FINAL.pdf](http://www.newbuildings.org/sites/default/files/110712_NBI_Sensitivity_Report_FINAL.pdf).

<sup>11</sup> Financing is a key tool in achieving deep retrofits. Specific financing proposals will be provided via a separate ruling.

- v. Investigate using an Energy Smart Jobs (ESJ) approach to ensure that the first contact gathers all of the relevant information required for both the basic and more comprehensive analyses. On a basic audit, the first contact should have the tools to present a set of measures and approximate savings before leaving the site.
  - vi. Increase uptake of the top ten measures in the Draft Potential Study for commercial potential into SW programs. These cover the following areas (Food Service, Indoor lighting, Exterior lighting, HVAC, Refrigeration, Plug Load, Process).
- f. **Address split-incentives in leased owner occupied buildings.**
- i. Programs addressing small businesses in tenant leased space should facilitate the owner's participation to compile a participant "toolkit" with tenant outreach materials, FAQ sheets, phone number to call, and etc.
  - ii. Increase the installation of sub-meters, plug load technologies, and energy management systems through incentives for owner-occupied and multi-tenant buildings.<sup>12</sup>

## 5. **Proposed Pilot Project**

The CEC is developing BEARS for California. This rating tool is a critical component of AB 758. AB 758 (Chapter 470, Statutes of 2009) requires the CEC to develop and implement a comprehensive program to achieve greater energy savings in California's existing residential and nonresidential building stock.<sup>13</sup> The BEARS tool should either be integrated into existing programs for the 2013-2014 period or become a separate pilot for the joint IOUs.

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<sup>12</sup> [http://www.newbuildings.org/sites/default/files/110712\\_NBI\\_Sensitivity\\_Report\\_FINAL.pdf](http://www.newbuildings.org/sites/default/files/110712_NBI_Sensitivity_Report_FINAL.pdf).

<sup>13</sup> [http://www.energy.ca.gov/ab758/documents/AB\\_758\\_Technical\\_Support\\_Contract\\_Scope\\_of\\_Work.pdf](http://www.energy.ca.gov/ab758/documents/AB_758_Technical_Support_Contract_Scope_of_Work.pdf).

## Section III: Lighting Programs

### 1. Description of Current Programs

- a. The **Basic Lighting subprogram** was designed to introduce efficient lighting products to positively influence the future consumer purchasing behavior. This program provides monetary rebates at the manufacturer and distributor level that incentivize consumers to purchase energy-efficient lighting products, currently basic compact fluorescent lamps (CFL). This more streamlined upstream process adds value by eliminating the need for further consumer involvement to obtain a rebate.
- b. The **Advanced Lighting subprogram** was designed to foster innovation of more advanced lighting products by lowering their retail price. This program helps develop economies of scale for new products that often are hindered by low demand due to high price points. These upstream rebates are mainly focused on lowering the price point of specialty CFLs.
- c. The **Lighting Market Transformation program** focuses on developing and testing market transformation strategies for both emerging and non-emerging technologies in the utility energy efficiency programs. This program covers interior and exterior applications in the residential, commercial, and industrial sectors, as well as replacement in existing buildings and new construction.
- d. The **Commercial Sector programs** rebate the installation of new energy efficient lighting through deemed incentives. The Direct Install program provides lighting measures for small business customers. In addition to utility programs, third party programs also provide lighting solutions to niche markets in the commercial sector.

### 2. Current Program Data

- a. Estimated Lighting Use per IOU Household (Source: Energy Commission (2009). California Energy Demand, Commission Adopted Forecast, 2010-2020):

Utility	Housing Type	Demand (kWh/year)
PG&E	Single Family	1,355
	Multi-Family	753
SCE	Single Family	1,247
	Multi-Family	683
SDG&E	Single Family	1,345
	Multi-Family	747

- b. Statewide Residential Lighting Demand (Source: Ibid):

Year	Total residential sector consumption	Residential lighting consumption – 22% of total (2008 figure)
2011	91,500 GWh/year	20,130 GWh/year

## c. Current Program Budgets (Source: IOU Annual Reports on EEGA):

<b>Program by Utility</b>	<b>PG&amp;E</b>	<b>SCE</b>	<b>SDG&amp;E</b>	<b>Total</b>
Residential Basic CFLs	\$30,000,231	\$32,328,190	\$12,678,175	<b>\$75,006,596</b>
Advanced Consumer Lighting	\$33,342,987	\$45,000,000	\$4,162,527	<b>\$82,505,514</b>
Lighting Market Transformation	\$462,565	\$1,043,394	\$0	<b>\$1,505,959</b>

*(Lighting measures are among many measures that are covered by the deemed incentives provided in the commercial programs, thus the budget specifics for commercial lighting measures are not available.)*

### 3. Market Challenges

- a. The current lighting programs are dominated by mature technologies, and there is not a clear substitute for CFLs that can achieve the same savings. Moreover, little funding is dedicated to supporting innovative products and helping technologies overcome market barriers to achieve higher adoption.

We have not invested in new technologies that can provide savings from sockets and fixtures that do not support or are not a proper application for CFL lamps. Thus, the opportunity cost for CFL subsidies includes the inability to fund the advancement of other technologies with greater potential.

- b. Title 24 standards will require screw-base sockets to be on dimmer switches – but manufacturers have not ramped up the production of dimmable CFL lamps, and the Energy Independent Security Act (EISA) of 2007 is only eliminating the most inefficient incandescent lamps, allowing many lamps that are less efficient than CFLs to remain in the market. Consequently, consumers may tend to purchase less expensive and less efficient dimmable incandescent lamps if dimmable CFLs are not available.
- c. Production for linear fluorescent dimmable ballasts has not ramped up to the point that the market is ready for the new commercial construction requirement requiring their use in the 2013 Title 24 update.
- d. Basic CFLs, which are heavily supported in the current market, are not adequate for all applications, particularly in down lamp applications. However, there is substantial energy saving potential in California related to the replacement of inefficient incandescent down lamps that are deployed in homes all across the state. LED down lamps are perfect for this application, but they are currently too expensive for most consumers to purchase for in-home retrofits.
- e. California has not established adequate performance specifications for LED lamps that will ensure ratepayer funds only support quality products that consumers will desire. The development and implementation of these standards is necessary to avoid the prior experience with CFLs, in which early rebates for CFLs incentivized inferior products that permanently hampered public perception of this product.

### 4. Recommendations

Energy Division proposes significant changes to IOU lighting programs to dramatically improve their effectiveness. Broadly explained, the proposed changes, from Emerging Technologies (ET) to the Statewide Lighting Programs, contain promising measures that offer increasing potential for market transformation. Moreover, we recommend that the Lighting Market Transformation Program be refocused to serve as a coordination entity that assesses the lighting market status to include the proper measures in the appropriate program. Finally, we recommend that the current programs be simplified by including the lighting components of the residential and non-residential sectors as part of one overarching lighting program.

**Figure III-1: Lighting Programs**

- i. Lighting Market Transformation (LMT) Program. Beyond continuing the 2010-2012 activities, the LMT program serves as a coordination program that oversees the progression of lighting products from Emerging Technology to the Statewide Lighting Program.
- ii. IOU Research Programs. To the extent the Commission decides the current IOU Research Programs are worth maintaining, staff recommends they continue to be funded.
- iii. Emerging Technology Program. Aside from coordination from the LMT program, this program would contain the measures with the most promising and least transformed markets. As the markets of ET measures remain promising and become more transformed, they should transition to the Lighting Innovation Program.
- iv. Lighting Innovation Program (Formerly the Advanced Lighting Program). The Lighting Innovation Program would be designed as an intermediary step that the Lighting Market Transformation Program can use to measure progress through the programs. This program would consist primarily of small and medium scale demonstrations that have the goal of identifying the technologies that should be included in the Statewide Lighting Program.

The technologies to be included in this program will be selected by the Lighting Market Transformation working group in 2012. Input from the “2010 Lighting Technology Overview (LTO)<sup>14</sup>” suggests energy savings estimates in California for the six potential best practice lighting solutions. These best practices are not incorporated into mainstream IOU programs. The LTO is a useful starting point for the selection of Lighting Innovation Program technologies for demonstration.

- v. Statewide Lighting Program. The Statewide Lighting Program is designed to be the main source of both lighting savings and expenditures. This program contains the “proven” lighting measures that are implemented on a statewide scale – both new measures flowing out of the Lighting Innovation Program and existing measures (including more mature measures that are nearing the end of their inclusion in the program).

Basic CFLs should cease to be included (or should be heavily ramped down) in the Statewide Lighting Program. Supporting this, the “Draft 2011 California IOU Potential Study” indicates CFL savings per unit are decreasing as a result of 1) revised saturation that indicates the remaining potential is in specialty CFLs, 2) reduced average operating hours as lower use sockets account for a larger portion of new installations, and 3) generally lower per-unit savings estimates (based on the KEMA lighting 9 study). Moreover, the Commission’s stated direction in D.09-09-047<sup>15</sup> is for the IOUs to shift funding and focus from basic CFLs to more advanced products. D.09-09-047 also drastically reduced the basic CFL budgets for all utilities and disallowed funds from being shifted back into the Basic Lighting subprogram. Finally, Strategies 1 through 5 of the California Lighting Action Plan<sup>16</sup> calls for a “coordinate phase-out of utility incentives for purchase of CFLs” and provides guidance on key actions towards achieving this. The involved actions include “continu[ing] to decrease incentive levels and quantity of program discounted product in these channels until phased out.”

Instead, staff recommends that funding for CFLs to be directed towards specialty products such as dimmable CFLs. Again, the Commission’s stated direction in D.09-09-047<sup>17</sup> is for the IOUs to shift funding and focus from basic CFLs to more advanced products. As Title 24 is shifting to requiring that all incandescent screw-base sockets be on dimmer switches, it is important to incentivize consumers to install the most efficient and appropriate lamp. Responding to this code change, dimmable CFLs are the most efficient and appropriate lamp for general service dimmable lighting. Including dimmable CFLs in the IOU portfolios will help bolster this immature market so consumers do not chose to install less-efficient dimmable incandescent lamps.

Following the direction in D.09-09-047 for a focus on advanced products, staff also recommends the inclusion of dimmable control ballasts for linear fluorescent lamps in the Statewide Program. It is beneficial to prime the market so that compliant dimmable ballasts are readily available, and reasonably priced, by the time the 2013 Title 24 standards go into effect.

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<sup>14</sup> California Lighting Technology Center, Lighting Technology Overview, 2010 [http://cltc.ucdavis.edu/images/documents/publications\\_reports/2010\\_Lighting\\_Technology\\_Overview.pdf](http://cltc.ucdavis.edu/images/documents/publications_reports/2010_Lighting_Technology_Overview.pdf).

<sup>15</sup> CPUC D.09-09-047 was adopted on September 24, 2009, and is available at <http://docs.cpuc.ca.gov/Published/Graphics/107829.pdf>.

<sup>16</sup> The Action Plan for the Lighting chapter of the California Energy Efficiency Strategic Plan was completed in June of 2011. [http://www.cpuc.ca.gov/NR/rdoonlyres/1E859DC3-4563-460C-B1A6-E0CAAF04CBOC/0/LightingActionPlanFinal\\_June2011.pdf](http://www.cpuc.ca.gov/NR/rdoonlyres/1E859DC3-4563-460C-B1A6-E0CAAF04CBOC/0/LightingActionPlanFinal_June2011.pdf)

<sup>17</sup> CPUC D.09-09-047 was adopted on September 24, 2009, and is available at <http://docs.cpuc.ca.gov/Published/Graphics/107829.pdf>.

As we coordinate a phase-out of basic CFLs, staff recommends a coordinated phase-in of LED lighting. As indicated in the “Draft 2011 California IOU Potential Study,” the technical potential for LED lighting, starting in 2013, is significantly higher than the current market potential, marking a necessity for market transformation through an incentive program. Staff recommends the inclusion of LED down lamps in the Statewide Lighting Program. Down lamps are one area where the LED technology is ready and appropriate; CFLs are not appropriate for that application, and there is high potential savings in the replacement of widely installed inefficient incandescent lamps. Moreover, staff recommends the inclusion of general service LEDs that will conform to a California LED standard upon its establishment. As indicated in the “Draft 2011 California IOU Potential Study,” the technical potential for LED lighting, starting in 2013, is significantly higher than the current market potential, suggesting the necessity for market transformation through an incentive program. In the absence of a quality standard for LEDs, manufacturers could produce LEDs at the cheapest possible price point, resulting in customer dissatisfaction with LEDs, similar to what was experienced with CFLs.

Finally, other products to capture savings potential in niche markets should be considered for inclusion in the Statewide Lighting Program. For example, D.09-09-047 authorized the utilities to explore the incorporation of next generation, efficient incandescent bulbs as a way of overcoming customer reluctance to use basic CFLs.

## **5. Program Delivery / Market Coordination**

Coordination with the market, specifically within the Lighting Innovation Program, will draw heavily on the results from the Emerging Technology and Lighting Market Transformation trials. It will also be informed by exploratory research conducted by the utilities to select new products.

By June 2012, criteria and a process should be established by the 2010-12 Lighting Market Transformation (LMT) program staff to determine how new products will be selected into the Lighting Innovation program. This can be developed concurrently with the work the LMT program staff will conduct for the 2012 technology pipeline plans. Moreover, they are formalizing a process for the IOUs to determine when a specific lighting technology has become sufficiently mainstreamed and no longer requires IOU program support.<sup>18</sup>

The June 2, 2011 Lighting Market Transformation Program Report includes a description of lighting solutions IOU programs staff are tracking for inclusion into mainstream entitled the “LMT Lighting Solution Roadmap Spreadsheet.” This roadmap is being updated in the utility administered “Lighting Market Transformation Technology Roadmap Study<sup>19</sup>” and will be completed in 2012.

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<sup>18</sup> See p. 7 of PGE’s 1/31/11 Revision of the 2010-2012 Energy Efficiency Program Implementation Plan for Lighting Market Transformation program PGE2105, accessible at <http://eega.cpuc.ca.gov/Main2010PIPs.aspx>.

<sup>19</sup> The “Lighting Market Transformation Technology Roadmap Study” is \$125,000 and is being jointly administered by PGE and SCE. It was approved by Energy Division staff on May 27, 2011 and can be found on the internal Energy Division site “Basecamp.”

**6. Expected Results / Outcome Metrics**

Redesigning the IOU portfolio lighting programs will require a significant shift from established technologies with low price points and high energy savings. In the short term, the program will likely become smaller and more expensive. It is difficult to project energy savings and TRCs without knowing which technologies will be tested and included. We can glean insights from the “2010 Lighting Technology Overview (LTO),<sup>20</sup>” which provides energy savings estimates in California for six potential best practice lighting solutions. These best practices are not incorporated into mainstream IOU programs; however, LED down lamps are being tested as part of the 2011 Lighting Market Transformation Pipeline projects. The LTO is a useful starting point for selection of Lighting Innovation Program technologies for demonstration, and the savings below are only possible if the solution is deployed on a statewide scale.

Updated quantitative outcome metrics need to encourage the funding of promising innovative products and prevent significant amounts of ratepayer spending on false starts or beta products. Under this revised program design, outcome metrics should include annual gain in market share (as measured by sales), annual increase in retailers stocking the product, annual drop in price, increasing net to gross, and emergence of competing products using the same technology.

**ANNUAL ESTIMATED ENERGY SAVINGS**  
**TOTAL TECHNICAL POTENTIAL FOR SIX BEST-PRACTICE LIGHTING RETROFITS**

TECHNOLOGY	EXISTING TO STANDARD PRACTICE		EXISTING TO BEST PRACTICE		STANDARD TO BEST PRACTICE	
	ENERGY SAVINGS (MWh/yr)	ENERGY SAVINGS (%)	ENERGY SAVINGS (MWh/yr)	ENERGY SAVINGS (%)	ENERGY SAVINGS (MWh/yr)	ENERGY SAVINGS (%)
TASK-AMBIENT LIGHTING	2,590,000	37%	5,090,000	73%	2,500,000	57%
ICLS	751,698	50%	977,207	65%	225,509	30%
ELECTRONIC HID	—	0%	2,000,000	25%	2,000,000	25%
LED DOWNLIGHTS: COMMERCIAL	4,294,000	54%	6,221,000	78%	1,927,000	52%
LED DOWNLIGHTS: RESIDENTIAL	1,380,000	60%	1,835,000	79%	455,000	49%
SMART BI-LEVEL EXTERIOR LIGHTING	—	0%	1,949,000	40%	1,949,000	40%
<b>TOTAL</b>	<b>9,015,698</b>	<b>28%</b>	<b>18,072,207</b>	<b>50%</b>	<b>9,056,509</b>	<b>40%</b>

Energy Savings will be dependent on the product mix selected. Getting to the original intent of the Advanced Lighting Subprogram of 2010-12, the Lighting Innovation Program will be comprised of more advanced technologies. This means the savings for that program will likely be lower.

<sup>20</sup> California Lighting Technology Center, Lighting Technology Overview, 2010http://cltc.ucdavis.edu/images/documents/publications\_reports/2010\_Lighting\_Technology\_Overview.pdf.

**7. Budget**

Energy Division proposes the following budget allocation proportions for the various components of the lighting program. The dollar values shown in the right column of the table are for illustrative purposes only, assuming a budget of \$150 million. The table does not disaggregate funding for third-party lighting programs.

<b>Proposed 2013-2014 Lighting Program Budgets</b>	<b>% allocation</b>	<b>(\$MM)</b>
Lighting Market Transformation	20	3
Emerging Tech	18	27
Lighting Innovation	30	45
Statewide Lighting	50	75
<b>Total</b>	<b>100</b>	<b>150</b>

## **Section IV: Codes and Standards**

### **1. Description of Current Programs**

The statewide Codes and Standards (C&S) Program consists of four sub-programs: (1) building codes including advocacy, extension of advocacy, and “codes and standards enhancement” – or CASE – studies; (2) appliance standards - including the same three components as building codes; (3) compliance enhancement - measure-based and holistic, and (4) reach codes - local government ordinances and green building standards.

The C&S Program directly influences standards and code-setting bodies through performing CASE studies to strengthen energy-efficiency regulations. CASE studies are developed for promising practices and technologies and presented to standards and code setting bodies. Advocacy includes affirmative expert testimony at public workshops and hearings, participation in stakeholder meetings, and ongoing communications with industry and key market actors. “Extension of advocacy” efforts are carried out to improve the rate of compliance with Title 24 (building code) and Title 20 (appliance standards) primarily by providing education and training for key market actors.

The purpose of CEP is to increase the number of customers complying with existing codes and standards (as opposed to EOA which targets C&S for which CASE studies have been performed) through outreach, education and training activities. The Reach Code subprogram encourages local governments to adopt codes that exceed statewide minimum requirements.

Working with local governments to develop ordinances that exceed statewide minimum requirements, the RC subprogram is designed to improve existing practices at local jurisdictions through multiple activities such as providing best practices approaches to adopting RC, role-based training, conducting outreach to market actors in the community, and etc.

The principal program audiences are the CEC, DOE and local governments. Additional audiences are contractors, equipment installers and consumers. The ultimate outcome of the C&S program is to support the State to maximize energy savings and code compliance whereas for the RC subprogram the program intent is to assist the State in achieving its policy goals towards advanced efficient buildings.

## 2. Current Program Data

Tables IV-1 and IV-2 provide the current C&S Program data.

**Table IV-1: SW C&S 2010-2012 Program Budgets**

	PG&E	SCE	SCG	SDG&E	SW
C&S Program Budget by IOU	\$19 MM	\$6 MM	\$2 MM	\$2 MM	<b>\$30 MM</b>
% of C&S Program compared to Each IOU EE Portfolio Budget	1.53%	0.57%	0.66%	0.83%	
% of IOU C&S Program compared to SW C&S Budget	65%	23%	6%	7%	<b>100%</b>

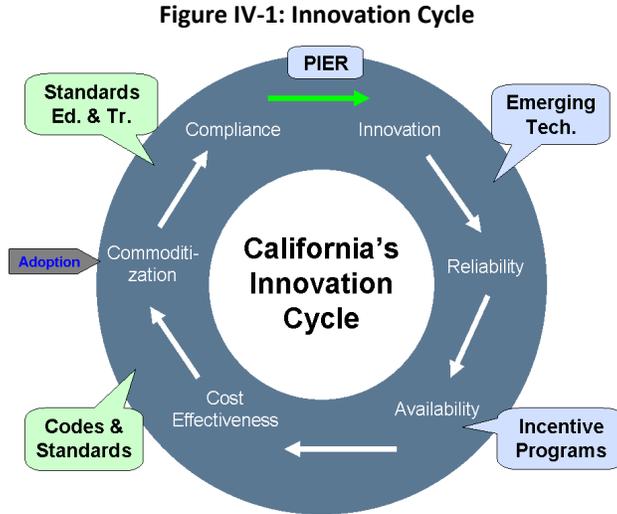
**Table IV-2: SW C&S 2012-2012 EE Savings**

	PG&E	SCE	SCG	SDG&E	SW
2010-2012 EE Portfolio Electric Savings (MWh)	706,057	580,401	0	131,710	<b>1,418,168</b>
% of C&S Program compared to Each IOU EE Portfolio Electric Savings	16.64%	11.97%	0.00%	17.06%	
% of C&S Program compared to Total Four IOUs' EE Portfolio Electric Savings	7.12%	5.85%	0.00%	1.33%	<b>14.30%</b>
2010-2012 EE Portfolio Demand Reduction (kW)	114,210	96,624	0	21,990	<b>232,824</b>
% of C&S Program compared to Each IOU EE Portfolio Demand Reduction	13.92%	10.15%	0.00%	14.20%	
% of C&S Program compared to Total Four IOUs' EE Portfolio Demand Reduction	5.82%	4.93%	0.00%	1.12%	<b>11.87%</b>
2010-2012 EE Portfolio Gas Saving (MW)	-5,446,152	0	8,289,908	-1,341,982	<b>1,501,773</b>
% of C&S Program compared to Each IOU EE Portfolio Gas Saving	-7.83%		7.87%	-12.51%	
% of C&S Program compared to Total Four IOUs' EE Portfolio Gas Savings	-2.93%		4.47%	-0.72%	<b>0.81%</b>
TRC	2.6	N/A (Assume 2.6)	3.05	1.89	<b>2.5</b>

## 3. Current Program Challenges

Currently, there is no formal process in place that dynamically integrates early planning and program activities across the IOUs' EE portfolios to ensure readiness for upcoming codes and standards. The C&S program should be designed to dynamically integrate codes and standards as

an essential strategic component of the entire IOU portfolio. Resource programs (that offer incentives) and non-resource programs (that offer education, training, marketing and outreach) should all include program components that support readiness for adoption of upcoming codes and standards.



#### 4. Recommendations

It is essential that the SW C&S program and other EE programs have symbiotic relationships to prepare the market for future codes and standards updates. The “dynamic and integrated” approach should be implemented by the C&S program and coordinated with other EE resource (incentives/rebates) and non-resource or informational programs in the IOUs’ portfolio to achieve the following goals:

- a. Maximize code compliance with current and future codes and standards;
- b. Improve code “readiness” by better coordinating IOU EE portfolio program offerings with anticipated future code updates; and
- c. Target “reach” codes to achieve ZNE goals for the residential sector by 2020 and the commercial sector by 2030.

In addition to the integrated approach within the IOUs’ EE programs and C&S, it is important to build collaboration between the CEC/IOUs/CPUC to achieve the AB1109 mandates. AB 1109 requires that California make the following lighting energy reductions statewide by 2018: 1) 50% for residential; 2) 25% for commercial; 3) 25% for outdoor. These are substantial savings mandates, though federal standards that eliminate incandescent lamps by 2018 can help California's meet the AB 1109 requirements.

As depicted in Figure 1, the dynamic nature of the C&S development and implementation requires an integrated continuum of activities between the various programs in the IOUs

portfolio. Specific coordination elements between C&S programs and other portfolio programs recommended by Energy Division include:

- a. **Workforce, Education & Training.** The C&S program offers trainings to facilitate adoption and improved code compliance by increasing awareness and improving understanding of requirements. However, technical training for installers (such as contractors and technicians) is crucial for ensuring that code-compliant products are installed and functioning correctly.

IOU WE&T programs should be modified to include training programs (for existing and new C&S, and Reach Codes) that prepare the workforce to install, commission, and maintain C&S products correctly for the various applications.

- b. **Marketing, Education & Outreach.** While the C&S program engages in a variety of outreach activities to facilitate the adoption of C&S, there still remains a gap in providing targeted messaging and marketing to current or upcoming future C&S. Such messaging could influence compliance with existing codes/standards and/or prepare the market for future code/standard adoption. One of the barriers to adoption is understanding and addressing consumer needs prior to adopting new standards and/or improving the performance of existing standards. Since there is a wide range of industries and organizations that span the spectrum of upstream to downstream market actors (manufactures and distributors to builders, retailers, contractors, homeowners and renters, energy consultants, HERS raters, appliance retailers, etc.), there is a need to have a ME&O sub-program specific to the C&S program.

The IOUs will develop a educational and outreach campaign targeting C&S products (for existing and new C&S, and Reach Codes). The campaign will have tailored messages specific to each of the market actors and applications that will improve the adoption of C&S. Another option (Option B), is to design a supportive informational C&S sub-program with the *explicit* goal of creating a marketing and outreach campaign to improve the understanding of the benefits associated with C&S implementation by the various market actors.

- c. **Incentive/Rebate Programs.** While code adoption theoretically causes commoditization, some of the adopted C&S might still have high costs that are inherent within the process, such as the cost of obtaining permits. In other cases, there needs to be a pull effect to enhance adoption. The role of incentives and rebates through resource programs should enhance the market readiness for code adoption by decreasing the marginal cost and increasing the commercialization of mandatory and reach standards.

Given that incentive/rebate programs usually target products and practices above and beyond C&S, these programs should only be used to support the adoption of existing and/or new C&S under the following cases:

- 1) Existing (adopted) C&S with low compliance rates AND with a minimum of one to one and a half-year gap between the date the standard has been adopted and its effective date;
- 2) Existing (adopted) and/or new Reach Codes;
- 3) Future C&S that have not yet been adopted by the CEC but have:
  - Proven and/or demonstrated technologies/practices through an ETP and a CASE study has *not* yet been developed, or
  - Proven technologies/practices for which CASE studies have been prepared.

Energy Division recognizes that it will be challenging to define the appropriate "low compliance rate" threshold at which incentives should be allowed to augment measure adoption via codes and standards. It may be more appropriate to identify specific markets where this boost is considered absolutely necessary (e.g., residential HVAC) and administer these exceptions on a case-by-case basis against pre-established criteria, with a strong rationale for each case presented / reviewed in the IOUs' applications.

## Section V: Emerging Technologies Program (ETP)

### 1. Description of Current Programs

The statewide ETP has six sub-programs: (1) Technology Assessment, (2) Scaled Field Placement, (3) Demonstration Showcases, (4) Market and Behavioral Studies, (5) Technology Development Support, and (6) Technology Research Incubation & Outreach Program (TRIO)

The mission of the program is to support increased energy efficiency market demand and technology supply (the term supply is meant to encompass the breadth, depth, and efficacy of product offerings) by contributing to the development and deployment of new and under-utilized energy efficiency (EE) measures (that is, technologies, practices, and tools), and by facilitating their adoption as measures supporting California’s aggressive energy and demand savings goals.

### 2. Current Program Data

	PG&E ETP Program	SCE ETP Program	SCG ETP Program	SDG&E ETP Program	SW ETP Programs
ETP Program Budget by IOU	\$31,199,866	\$16,537,442	\$3,515,000	\$4,050,854	<b>55,303,162</b>
% of ETP Program compared to Each IOU EE Portfolio Budget	2.43%	1.40%	1.28%	1.52%	
% of ETP Program compared to Total Four IOUs' EE Portfolio Budget	1.04%	0.55%	0.12%	0.13%	<b>1.84%</b>

PG&E Zero Net Pilot Budget	\$12,250,007
% of ZNE Pilot Program compared to PG&E EE Portfolio Budget	0.95%

### 3. Recommendations

Balancing the selection of projects and program activities to meet the CPUC Energy Efficiency Savings Goals as well as long-term Strategic Plan goals will require appropriate planning of resources and activities, as well as selection of different mixes and distribution of technologies that are suitable for California’s EE market. Other key factors regarding program balance of the emerging technologies projects include fuel types, end-use applications, market sector, consideration of technical and market potential, as well as risk.

The major recommended revision to the ETP is designing the program to balance its portfolio of emerging technologies projects. Program design should ensure that funds and resources are committed at the onset of program design and planning and clearly articulated in the program implementation plan to address the following key areas:

- 1 Balancing the portfolio of emerging technologies is critical to advancing EE technologies to ensure comprehensive inclusion of different market sectors and end uses;
- 2 Balancing short-term (1-3 years or within the program cycle) versus long-term (over 3 years) assessments as there is a need to commit program funds and resources to test emerging technologies over the long-term to target the goals of Big Bold Energy Efficiency of achieving ZNE by 2020 in the residential sector and by 2030 for the commercial sector as detailed in the EE Strategic Plan versus short-term;
- 3 Balancing new advanced and unproven versus emerging and/or underutilized technologies;
- 4 Planning is needed to consider transitioning new technologies from other external initiatives like PIER, universities, and entrepreneurs;
- 5 Designing the program to demonstrate technologies that are upcoming candidates for CEC Standards programs (including CEC identified measures that are in the “pipeline” for inclusion in upcoming cycles of the Standards); and
- 6 Expanding the committee members for ETCC to include key research organizations and universities, as well as the building and appliances standards setting bodies (CEC and DOE).

## **Appendix 1: Residential Retrofit Programs**

### **A. Energy Upgrade California – Single Family Whole House**

The launch of the EUC program has exposed hundreds of thousands of Californians to the concept that comprehensive and deep energy improvements in the home can save on utility bills and improve a home's comfort and safety. But since its launch in early 2011, customer uptake of the EUC rebates has been slower than expected, about 2,500 homes as of November, 2011 - an average of about 40 jobs per month. A variety of factors have contributed to these uptake rates:

- 1 About 30% of California homes are now “underwater” (valued at less than mortgage)
- 2 At least three exposures to EUC-type marketing are needed for most consumers to make such a large decision, and contractors are still learning how to sell the “intangible” energy improvements as linked to improve health, safety and comfort in the home
- 3 Upfront costs of the upgrade are averaging around \$12,500 a large investment for most households
- 4 Delays in establishing and then streamlining program infrastructure systems (software analysis tools, job report approvals, QA/QC) have caused additional expenses and delays to and contributed to customer drop outs.

Driving customer demand remains the highest priority for this program. Ratepayer-funded market research indicates that key “trigger points” for customers to undertake whole house improvements include:

- Replacement of large appliances (AC, furnaces, water heaters)
- Purchase of new home
- Planned major renovation
- Learning of the availability of financing
- Lifestyle changes, such as a new job or new baby

To drive increased customer demand for EUC whole house energy upgrades in conjunction with the expected CAEATFA Clean Energy Upgrade loan product, Energy Division offers the following proposals for discussion and stakeholder feedback:

- 1) Beginning with the 2013-2014 portfolio, build into the IOU portfolios a long term (5-10 year) commitment to Energy Upgrade California as a market transformation program;
- 2) Increased EUC and HVAC incentive levels as early as 2012 to “prime the pump” for the CAEATFA Clean Energy Upgrade loan product, and changes to the EUC and HVAC incentive structures to drive all such jobs towards full whole house upgrades;
- 3) Takeover of financial support by ratepayers for the Energy Commission-established EUC statewide website and appropriate levels of ratepayer support for additional EUC marketing and outreach, starting in April, 2012; and
- 4) Institution of a broader set of additional incentive changes in 2013-2014 to build on the successes of 2012 and test key elements of the expected AB 758 program.

Additional details on these proposals are provided in this appendix.

- 1) CPUC Commitment to Energy Upgrade California as a Long Term (5 - 10 year) Market Transformation Program as part of the 2013-2014 Funding Process**

The lack of a long-term CPUC commitment to the EUC as a market transformation program to drive California towards achievement of the CEESP's 40% per home energy use reductions is a major barrier limiting contractor participation in the program. Energy Division proposes that the CPUC remove this barrier to contractor participation by articulating its commitment clearly. It should also, at the right moment, articulate the principles for a long term incentive strategy to support market change. Energy Division staff recommend consideration of a five- ten year declining stepwise incentive structure similar to that of the California Solar Initiative. We also recommend alteration of the current EUC incentive structure to drive the highest energy reductions possible, in addition to the highest per home percentage energy use reductions (the emphasis currently).

**2) Increased EUC and HVAC incentive levels as early as 2012 to “prime the pump” for the CAEATFA Clean Energy Upgrade loan product, and changes to the EUC and HVAC incentive structures to drive all jobs towards full whole house upgrades**

The Clean Energy Upgrade (CEU) loan product to be established by CAEATFA in early January 2012 will help address one of the major barriers to comprehensive home energy upgrades – the upfront costs. The program will also establish a foundation for any additional financing programs in subsequent years. To ensure the success of the CEU loan product, Energy Division proposes additional incentives to contractor participation in the EUC, linked to customer usage of the CEU loan product, as early as 2012 (concurrent with the CEU program launch).

Specifically, we propose consideration of:

- a. Increasing EUC performance-based incentives to a maximum of \$5,000 for 40% energy reductions, with additional “kickers” for the highest KW savings households;
- b. Encouragement of financing institutions participating in the CEU loan loss reserve program to offer reduced interest rate financing to full EUC energy upgrade jobs over single measure jobs;
- c. Consideration of additional modest incentives for HVAC contractors that install high efficiency air conditioners using the CEU loan product, with quality assurance for quality installation of these units ensured through a requirement that contractors represent and warrant that all applicable permits have been obtained (consistent with the SB 454 – Pavley, 2011 – requirements) for downstream programs;
- d. Phasing-in the requirement of IOU HVAC Quality Installation training courses for high-efficiency HVAC replacement jobs taking advantage of CEU financing, within six months to one year of the CEU program launch;
- e. Provision of a significant contractor incentive for the first 10 jobs that HVAC contractors “upsell” to full whole house EUC projects, to induce HVAC contractors to obtain required EUC program participation training and/or to partner with EUC-qualified contractors; and
- f. Establishment or continuation of a dedicated outreach and marketing effort on the CEU EUC/HVAC program, possibly through new trade channels such as HVAC home warranty markets, HVAC trade associations, real estate companies, and/or advertising firms.

**3) Transition of financial support from ARRA funding to ratepayers for the Energy Commission-established EUC statewide website and appropriate levels of ratepayer support for additional EUC marketing and outreach, starting in April 2012**

By ruling dated October 13, 2011 the current statewide energy efficiency marketing education, and outreach campaign, known as “Engage 360” was suspended. The October 13, 2011 ruling also asked parties to comment on possibly rebranding that statewide campaign under the Energy Upgrade California or Flex Your Power brands. If Energy Upgrade California were to become the new statewide energy efficiency “umbrella” brand, that would entail the expansion of the brand name to marketing of consumer and business awareness and program participation in programs beyond the current Energy Upgrade California residential-only sector whole house program (to the commercial, industrial, and agricultural sectors), and conceivably also its expansion to the full suite of demand side energy options (demand response, distributed generation).

While the brand issue is under consideration by the Commission, Energy Division proposes that ratepayer-funded financing be provided to maintain the existing EUC program website, beginning in April 2012. Energy Division also proposes that ratepayer funds be made available in 2012 for continued ARRA-funded local government and other state and regional EUC marketing and outreach programs and activities. A primary emphasis should be placed on improving efforts to close contractor sales to homeowners that are already interested in the program. EUC website support, outreach and marketing starting in 2012 could concentrate on:

- a. Establishing systems to better track customers that have established “Action Plan” accounts on the EUC website and having trained call center operators and/or participating EUC contractors make follow-up calls to close sales;
- b. Providing bridging financing (until 2012-2014) for EUC website maintenance, and EUC outreach infrastructure, marketing and advertising costs (possibly including activities at the state, regional or local level);
- c. Presentation of modest rebates to new EUC participating contractors (in the program less than six months) that maintain a 25% close rate between EUC- qualified audits and installation jobs to incent contractors to improve their close-the-sale techniques; and
- d. If available, training for contractors on software tools that integrate EUC energy and cost savings information with financing options and payback periods to assist in contractors “closing the sale.”

**4) Institution of a broader set of additional incentive changes in 2013-2014, as part of the funding process, to build on the successes of 2012 and test key elements of the expected AB 758 program**

AB 758 requires the Energy Commission to develop comprehensive residential and non-residential retrofit programs, in coordination with the CPUC. The Energy Commission is working to complete residential and non-residential sector “Needs Assessments,” and aims to release residential and non-residential sector “Action Plans” for review in early 2012.

Energy Division proposes planning now for the types of recommendations likely to emerge from the AB 758 process. Below are some Energy Upgrade California program design changes that could test and help develop best practices to drive demand and energy savings through the type of comprehensive, whole building program likely to be recommended in the AB 758 residential “Action Plan.”

- A. Local Governments: The 2013–14 portfolio could include outreach to local governments to encourage them to adopt mandatory home energy use disclosure, scope of work development, and rating requirements, before the time of sale by the home **seller**, and mandatory energy upgrade requirements within one- two years by the home **buyer**. Residents in local government jurisdictions adopting such requirements could then be eligible for:
- \$200/ home rebate for development of required energy ratings (using the Whole-House Home Energy Rating System,) and scopes of work for energy improvements. Scopes of work in this approach would be based on a diagnostic audit and would indicate required improvements needed to achieve a minimum of 20% energy savings per year. A Whole-House Home Energy Rating and diagnostic test-based scopes of work may only be provided by certified home energy performance professionals, a requirement that exceeds any current requirements of jurisdictions with Residential Conservation Ordinances (RECOs); and
  - “Kicker” Energy Upgrade California incentives to home buyers for completion of minimum 30-40% energy savings work based on the scope of work energy improvement recommendations.

This proposed approach would:

- 1 Continue to field test and improve the Whole-House Home Energy Rating tool;
- 2 Support development and improvement of the RECO concept;
- 3 Provide before and after data to improve energy audit and rating software tools and, as such, support improved availability of financing;
- 4 Incentivize truly deep savings (>30%) in participating jurisdictions;
- 5 Lead to improved contractor capacity and positive word of mouth regarding the EUC program and the benefits of whole home improvements.

- B. Moderate Income Households: Explore ways to improve program uptake by moderate income households by adjusting the “basic” EUC rebate offering by considering:
- Groups of pre-described measures (current offering requires installation of five prescribed measures); and
  - Higher rebate levels for income-qualified households, utilizing existing IOU procedures used in the MIDI and Energy Savings Assistance Program (ESAP) to verify the determined income levels.
- C. Increased Attention to Pool Pumps: Explore linking high efficiency pool pump replacements and the EUC program by offering a modest “kicker” rebate to EUC contractors that provide leads resulting in efficient pool pump installation within six months (and/or at the time of the EUC job).

## 5) Data Sharing

High upfront costs and a lack of attractive financing is a major barrier to comprehensive energy upgrade work via the EUC. To continue to build the case for the real energy savings and associated costs from whole house upgrades, the IOUs should be directed to share EUC

data, such as: aggregated data on high energy-using neighborhoods; per household level data for participating EUC households on: projected savings; actual savings; and, all-in job costs.

This data should be shared with the California Energy Commission and specifically local governments conducting jurisdiction-specific EUC marketing, outreach, and research. Non-disclosure agreements and data security protocols would be required prior to data sharing with any entity. Data must be provided in aggregated and disaggregated form and in industry standard electronic formats. In addition, aggregated data should be provided in a manner that prevents identification of a single customer's energy usage and at the finest level of granularity possible.

## **B. Energy Upgrade California – Multi-family Whole Building**

About one-third of California households reside in Multi-family (MF) buildings. For lower income Californians (<\$25,000/year income), this figure is closer to 60%, and most of these individuals reside in buildings with less than 5 units. A rough estimate would be that MF buildings statewide consume roughly 9 GWh/year of energy. Because many MF buildings are older the savings potential associated with reducing energy use for 15% of the MF units in California by 25% is estimated at 534,000 MWh/year of electricity and 37 MMtherms. In general, though MF units consume just 52% of the annual electricity that SF homes do, these energy costs comprise a higher percent of earnings and housing costs of the mostly lower income households that reside in those units. The two major barriers that hamper most MF building owners from undertaking comprehensive energy upgrades are split incentives between owner and tenants, and lack of capital.

The MF market is currently served by the statewide IOU MFEER subprogram in which contractors install a range of qualified measures for free or with modest rebates. The MFEER is generally a cost-effective program under CPUC Total Resource Cost (TRC) tests. PG&E also offers a "Middle Income Direct Install" programs (MIDI) in some local jurisdictions, for both MF and SF households found to be just above Energy Savings Assistance Program (ESAP) qualifying levels, and SDG&E reports it is introducing a similar effort shortly. Under these pilots, installation of a range of measures is free for qualifying moderate income households residing in neighborhoods served by the ESAP.

Software performance-based audit tools for comprehensive MF whole buildings were tested in California in 2010-2011 (with the use of ARRA funds), as were infrastructure elements such as standards and trainings for MF performance auditors and raters (using HERs II for MF module). ARRA-funded MF pilots in San Diego and San Francisco have successfully focused on generating MF building owner demand and testing performance contracting modeling coupled with financing.

In conjunction with local ARRA-funded efforts, SDG&E has launched a MF Energy Upgrade California whole building program element in mid-2011 aimed at achieving at least 20% building-level energy consumption reductions. Energy Division expects the other IOUs to follow suit in early 2012. These EUC MF program element pilots are expected to streamline MF building owner engagement in comprehensive upgrades by allowing them to utilize existing contractors who are, in turn, required to perform work to standards overseen by MF HERs II raters. The MF HERs II raters will produce the building work scope and assess completed jobs.

Energy Division offers the following proposals for additional improvements to the IOU MF EE programs for discussion and stakeholder feedback:

- 1 Evaluate EUC MF program elements launched in 2011 and 2012 during the 2013-2014 period to inform their further expansion in the 2015-2017 period;
- 2 Consider the recommendations of the MF Subcommittee of the California Home Energy Retrofit Coordinating Council and the approaches emerging from ESAP MF whole building efforts to further develop and refine EUC MF program elements;
- 3 Pursue all avenues to overcome the split incentive barrier;
- 4 Increase targeted outreach to MF building owners to drive demand; and
- 5 Ensure that all central system measures (i.e., boilers, central air, water, and heaters) become available via the existing MFEER program, so that the complexity associated with MF building owner access to single measure rebates is decreased.

### **C. Air Conditioning Specific EUC Recommendations**

While space cooling consumes only 7 percent of annual residential electricity consumption, it is the main driver of residential peak load (RASS, 2010, p. 19). Between 7 and 12 percent of CA households replace an air conditioner (AC) or furnace annually. This amounts to at least 800,000 AC units per year for all buildings, or about a \$1 billion California market.

In 2010-2011, the IOUs established new statewide HVAC quality installation, maintenance and other programs in response to the HVAC “Big Bold” imperative of the California EE Strategic Plan. The new IOU HVAC programs cover both residential and commercial markets. In November 2010, HVAC industry coalitions in partnership with the CPUC, CEC, and the IOUs, launched the Western HVAC Performance Alliance. These and other entities also launched a California HVAC Action Plan in mid November, 2011. As mentioned previously, AB x 1 14 (Skinner, 2011) establishes a \$25 million Clean Energy Upgrade (CEU) loan loss reserve program for residential energy efficiency improvements, commercial energy efficiency improvements (up to \$25,000), water improvements, and electric vehicle charging stations. Although details of this program are not final, it has the scope to potentially provide for lower interest rate financing for high efficiency HVAC units. Together these programs and efforts move in the right direction towards the HVAC Big Bold targets. However, they may not yet fully capture the potential of the high efficiency HVAC installation market in California.

To add to these programs and drive demand for an increasing rate of installation of high efficiency HVAC units in response to “reactive” replacement situations, Energy Division proposes the following program design changes to encourage HVAC contractors to participate in the CEU financing product, to “upsell” HVAC replacement jobs to full Energy Upgrade California whole house jobs, and to improve code compliance rates:

- 1 Develop outreach programs to recruit HVAC contractors and homeowners to participate in the CEU financing program, which would support IOU HVAC upstream units;
- 2 Moderate contractor incentives for the first 10-20 HVAC units installed using CEU financing;
- 3 Require HVAC contractors participating in the IOU’s HVAC Upstream Incentive Program demonstrate proof of Title 24 permitting at the time of their purchase of the program-qualifying high-efficiency AC units; and,
- 4 Require contractors to provide a copy of this proof-of-permit as part of the CEU loan application process.

## Appendix 2: Residential New Construction (RNC) Program

Newly constructed homes make up a relatively small but extremely important target population for efficiency improvements. Newly constructed homes can be designed on a blank slate, enabling a wide range of design features, products and characteristics to be built in. Existing buildings have to compete with new homes in the real estate market, so the modern features of newly constructed homes represent a standard for existing homes that impacts their marketability.

Construction of new homes in California has declined since 2008 to now comprise a fraction of a percentage of all existing homes per year. Approximately 100,000 new single family homes and about 50,000 MF units are built annually in California. Although construction at these levels creates a barrier to achieving major energy savings through IOU RNC programs, it also represents an opportunity to conduct an aggressive program focused on a small number of builders that have demonstrated a resiliency to the market downturn. In such a market, the remaining builders are industry leaders that may be willing to position themselves for renewed vigor when the market expands. The opportunity exists to work collaboratively with this smaller group of builders to make market-transforming changes to the homes they market by building to Reach standards and being on the road to Zero Net Energy (ZNE) homes for 2020.

The IOUs are currently undertaking market characterization studies for the new homes MF market, and examining EE/green homes best sales practices for leading single family home builders in an effort to increase penetration levels.

**Table A2-1: IOU 2010-2012 Residential New Construction Program Budgets**

Program by Utility	PG&E	SCE	SDG&E	SoCalGas	Total
California Advanced Homes Program	\$13,521,688	\$24,894,000	\$4,398,013	\$8,570,086	\$51,383,787
Energy Star Mfctd Homes Program	\$7,244,690	\$3,516,000	\$410,000	\$0	\$11,170,689
Total Statewide Programs by Utility	\$20,766,378	\$28,410,000	\$4,808,013	\$8,570,086	\$62,554,476
<b>Total Savings:</b>				Electric (GWh)	<b>27970631</b>
				Electric (kW)	<b>30932</b>
				Natural Gas (Therms)	<b>1595996</b>

Source: IOU 2010-2012 EE Portfolio Compliance Filings

Achievement of ZNE buildings in California's building energy codes by 2020 for residences is one of the State's highest priority energy efficiency, climate change, and clean energy jobs goals. It is a showcased strategy in Governor Brown's Clean Energy Jobs Plan and in the Clean Energy Future initiative, a collaboration between the Governor's Office, the CPUC, the Energy Commission, the Air Resources Board, the California Environmental Protection Agency, and the California Independent System Operator. Prior to being a lynch-pin of these new policies,

strategies for achieving ZNE in California's residential Title 24 energy code by 2020 was featured in the Energy Action Plan, the CPUC Long Term Energy Efficiency Strategic Plan (CEESP), the ARB Assembly Bill 32 Scoping Plan and the CEC Integrated Energy Policy Report (IEPR). Collectively these documents call for a California residential ZNE strategy involving the development and implementation of mandatory and Reach standards in each upcoming three year update of the Building Energy Efficiency Standards (Title 24; 2014, 2017, 2020).

The adoption of mandatory Title 24 standards on a three year cycle has been a California success story, but the addition to Title 24 in 2008 of "Reach standards" that are more demanding than core Title 24 standards, is a recent state agency directive. The new Title 24 Reach standards are an important means to prepare the RNC industry for standards changes that will be necessary. Gaining a substantial share of the new construction market by having builders design and build to the Reach standards as they are approved provides an important opportunity for the incorporation of new building practices and emerging technologies, and gaining the experience, economies of scale, and marketplace competition that will bring down the cost of ever more efficient homes.

The 2013 Title 24 Standards are expected to be 30% better than the 2008 Title 24 Standards. Starting in 2013, Energy Division proposes that IOU RNC programs be designed to provide incentives and technical support to promote the acceptance of successive levels of Title 24 standards. This approach is consistent with the Big Bold Zero Net Energy Residential New Construction targets supported by both the CPUC and the CEC.

Designing and building in energy efficiency into newly constructed homes represents what otherwise would be a societal lost opportunity. Financing newly constructed homes typically stretches over a 30-year life, and commonly new homes last much longer. At the point of design and construction, energy efficiency can be incorporated at maximum cost effectiveness. Never again in the home's life will it be so easy to build in the energy efficiency measures at such a low cost. The opportunity cost of failing to do so, unfortunately, is commonly left out of cost effectiveness analyses.

The IOU RNC program ("California Advanced Home Program") was redesigned for 2010-2012 to offer sliding scale performance incentives to participating builders for energy efficiency performance levels 15-40% above Title 24 requirements. The IOUs also made available additional "kicker" incentives (e.g., for reaching the 30% above Title 24 level required for builder participation in the California New Solar Homes Partnership NSHP; a peak KW incentive; green and compact homes incentives, and others). However, to meet California's existing residential ZNE goals, still further reforms are needed.

Energy Division's primary RNC proposal is that the 2013-2014 IOU new home programs should be framed within a larger residential California zero net energy new homes market transformation strategy. Energy Division also offers the following specific, related RNC strategies for discussion and stakeholder feedback:

- 1 Designing RNC incentives to encourage the early adoption of base and Reach 2013 Title 24 Standards (with an implementation date of January 2014);
- 2 Designing IOU RNC programs to encourage the use of a whole building design rating (HERS) as a metric, rather than a "percent better than Title-24";
- 3 Increasing IOU RNC incentive levels to make items 1 and 2 more attractive to participating home builders;
- 4 Emphasizing measures identified for incorporation into future code cycles in whole house design curriculum and IOU RNC program technical and design templates for use by builders participating in IOU RNC programs;

- 5 As part of statewide WE&T efforts, expanding ratepayer-funded building classroom and in-the-field training programs for trades people, architects and consultants, including the use of energy modeling tools, and quality installation requirements verified by builders using diagnostic tools;
- 6 Developing, via collaboration by IOUs, the CPUC, builders, and others with the CEC, new home program implementation software and online registry systems based on the 2013 Standards update;
- 7 Establishing, via collaboration between IOUs, the CPUC, the CEC and other key stakeholders, a ZNE Roadmap which identifies efficiency measures likely to be adopted into Title 24 RNC Standards in 2017 and 2020 (and subsequently – as early as 2016 – designing IOU RNC incentive programs to encourage the use of these measures); and
- 8 Developing an agency-endorsed “Energy Leaders Circle” of leading California home builders that commit to building near-ZNE and ZNE homes.

### **Appendix 3: Plug Load and Appliances Program**

Energy Division proposes that a new Plug Load and Appliances Program should consolidate the existing Home Energy Efficiency Rebate (HEER) Program, the Business and Consumer Electronics Program (BCE), and appliance recycling components retained from the previous Appliance Recycling Program (ARP). The goals of the proposed consolidation include:

- 1 Movement of all feasible plug load and appliance subsidy programs upstream to manufacturers to reduce program administrative costs, and the development of clear criteria for the appropriate incentive delivery channel (i.e., upstream to manufacturers, midstream to retailers, or downstream to consumers) for all incented measures;
- 2 Reduced costs from capturing efficiencies in the development of retailer partnerships across appliance types;
- 3 Reorientation of appliance recycling program activities to reflect market changes; and
- 4 Rapid transition of technologies from the Plug Load program (which would be aimed increasingly at early adopters) into Title 20 codes.

#### **A. Appliances, Pool Pumps, Furnaces, Water Heaters**

TVs, PCs, Office Equipment, Game Consols and TV Set Top boxes comprise 20% of California households annual electricity consumption (see Section IV); the percentage of consumption coming from plug loads is expected to continue to rise towards 2020, making this an increasing priority area. New TV and battery charging standards introduced by the CEC in 2010 and 2011, and increasing Title 20 focus in this area limit and focus opportunities for effective IOU program interventions. IOU-ED collaborative work to assess opportunities for TVs and TV set boxes is focused in 2011 on ensuring incentive design that drives the evolution of tighter ENERGY STAR® standards. Input from the Energy Commission on IOU Codes and Standards CASE study research priorities to drive Title20 advances in 2013-2014 is also critical.

Appliances such as dishwashers, microwaves, stoves, refrigerators and freezers consume an average of 24% of the average Californian household's electricity. Energy Division sees benefits to moving to more of a codes and standards based appliance strategy aimed at incenting only a limited number of highly efficient appliance models (CEE Tier 2 and 3; ENERGY STAR® in some cases), targeting early adopters and supporting the movement of the specifications into Title 20 (or where applicable, federal standards) as soon as possible.

The 2013-2014 portfolio should include discussions of a phased-in requirement for rebated appliances to contain smart chips.

#### **B. Appliance Recycling**

Findings from evaluation studies of the Appliance Recycling Program (ARP), a recent Department of Energy (DOE) report, 2008 ARP Process Evaluation results, and the draft Navigant Potential Study provide information suggesting that IOU appliance activities should be significantly revised in 2013-2014. Data from the 2006-08 ARP impact evaluation indicates that per unit refrigerator energy use and savings from the program has declined significantly since 2002. The DOE report also indicates that units manufactured after 1993 do not use appreciably less energy than new standard units. The 2011 ARP Process Evaluation research indicates that only 20% of the refrigerators in the ARP the program were removed from the grid. In addition, secondary market dealers interviewed for the 2006-08 evaluation report indicate that little resale value exists for fridges older than ten years.

Party comments in response to an Assigned Commissioners October 25, 2011 Ruling and Scoping Memo Regarding 2013-2014 Bridge Portfolio and Post-Bridge Planning, Phase IV, indicate significant support for the integration of a reoriented recycling program element within this proposed new Plug Loads/ Appliances SPREE subprogram.

Energy Division proposes additional comment as needed on updated appliance recycling strategies for which parties have indicated support:

- 1 Addition of New Appliances: Expansion of recycling efforts to include clothes washers (NRDC) and air conditioners (TURN);
- 2 Distribution Center Pick-Ups: A reduction in overall program costs by directing retailers to pick up units ; IOUs pick-up of appliances in the home would be replaced by pick-ups at partner retailer distribution centers (SCE); retailers that currently provide this service for free should continue to do so (TURN); avoiding duplicating existing efforts (DRA);
- 3 High Consumption and Secondary Units Emphasized: An emphasis on collection and recycling of vintage models , secondary units, and extra freezers; targeting units with highest savings potential (SCE);
- 4 Influencing Appliance Purchaser's Decision: Using results of current recycling retailer trial to determine the best approach to partnering with retailers to cost-effectively capture savings through influencing a new appliance purchaser's decision to retire their old units; retailer deliver the new appliance while picking up the discarded appliance (SCE); coordination of product take back efforts with appliance manufacturers and recyclers (Ecology Action);
- 5 Incentives Conditioned Upon Surrender of old Appliance: Provision of Incentives for new high efficiency models requires that old appliances be surrendered (DRA, NRDC);
- 6 Transition of Recycling to Market Actors: IOU identification of a plan to transition recycling program to market players, by a specific date (DRA);
- 7 Highest Standard of Recycling: Continuation of ARP requirements for participating recyclers to comply with highest standards of recycling, including for greenhouse gas emissions in refrigerants and foam insulation (PG&E, Ecology Action, Women's Energy Matters, City of San Francisco); and
- 8 Development of new recycling approaches for multifamily sector, including a bulk exchange approach (Ecology Action).

**(END OF ATTACHMENT A)**