# I O U

## Core

## Programs

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# Program Implementation Plan Template

## Program Overview Template[1]

This template has been modified to identify areas of the New PIP template that do not necessarily work for the Energy Efficiency Financing Program and sub-programs and therefore are not required to be submitted as part of the 2013-2014 applications due on July 2, 2012. The sections that are not required (unless given further instruction by Energy Division) are labeled "N/A" for Not Applicable or "TBD" for To Be Determined. Areas that are recognized as being challenging for the Financing program are labeled as "Rough Estimate, If Possible." Otherwise, all other sections are required to be submitted for the Energy Efficiency Financing Program to the best of the utilities' ability.

Please note – the Program Description Narrative for the Financing program will be the most important section of this PIP and for the sub-program PIP.

1) **Program Name – Statewide Finance**

2) **Program Description (general)**

The Statewide Finance Program is designed to help achieve the following potential major benefits:

- Encouraging customers to invest in projects that will achieve deeper energy savings.
- Overcoming the "first cost" barrier of energy efficiency upgrades;
- Leveraging ratepayer funds by bringing in private capital;
- Increasing sales of energy efficient products and services; and
- Reaching a broader set of customers and market segments.

The Statewide Finance Program consists of a portfolio of financing options to be implemented consistently on a statewide basis, including continuation of the On-Bill Financing (OBF) program, continuation of the American Recovery and Reinvestment Act (ARRA)-originated financing programs, and a set of new financing programs for single-family and multi-family residential customers as well as for small business and broader non-residential customers.

These financing offerings are intended to eventually support all types of demand-side investments, including energy efficiency, demand response, distributed generation, and storage.

In order to expedite and coordinate the development and expansion of the Statewide Finance program, the Commission directs SoCalGas and SDG&E, on behalf of all utilities, to hire an expert financing consultant no later than August 1, 2012. This effort will be co-

[1] This cover page "Program Overview Template" shall be completed consistently by all IOUs for statewide programs.

funded by all of the utilities and may come either from unspent 2012 program funds and/or 2013-2014 funding.

The expert financing consultant will convene a set of two or more working groups designed to address:

- Program design issues for new financing programs.
- Energy project and loan performance data collection and dissemination issues.

The expert financing consultant will design financing pilot programs in 2012 to be launched in 2013 and scaled up in 2014. The utilities and the expert financing consultant will consult with the local governments and their partners on financing program development experience gained in the past few years through PACE and ARRA funded programs.

The new financing programs will be designed based on the following principles as directed by the Commission:

- Each financing product will be uniform across the state
- "Keep it simple and fast", avoid overly-complex design or paperwork and allow contractors and other marketing agents to present finance information to the borrower/energy-user to drive transactions.
- For the non-residential on-bill repayment program, a single servicing agent will be considered to relay simple finance payment information to the utility bill.
- The single servicing agent will be responsible for all special adjustments, the originator will be responsible for consumer inquiries, and there will be a separate program dispute resolution process for issues with contractors.

The expert financing consultant will identify and define these elements in more detail in 2012 for launching pilots in 2013. The 2013 and 2014 pilot programs will be explicitly designed to gain program experience and data, particularly with respect to debt repayments and project energy savings, which could attract additional capital resources from interested financial institutions and other businesses. The expert financing consultant will present 2013 pilot program design details in a written program plan and a public workshop by the end of 3rd quarter of 2012.

In consultation with the expert financing consultant and a working group convened by the consultant, the utilities will develop for California (or perhaps in collaboration with a national effort), a database of financing-related project performance and repayment data. This database will protect individual customer privacy, be shared publically, and will contain, at a minimum:

- Customer type,
- Host site characteristics,
- Customer payment history to the utility,
- Customer/borrower credit scores and energy project repayment histories,
- Energy project performance data (by building or customer, not only by measure),

- Billing impacts comparing pre- and post-installation utility bills.

## 3) Total Projected Program Budget and Savings (2 year)

The statewide portfolio of financing programs will be funded at a level of at least $200 million statewide over 2013-2014.

**Table 1: Total Projected Program Budget & Savings by Subprogram (Rough Estimate, If Possible)**

| Program Code | Program Name | Administrative Amount | Marketing Amount | Direct Install Amount | Incentive Amount | Total Budget Amount |
|---|---|---|---|---|---|---|
| | **SW Finance** | | | | | |
| 3262 | SW-FIN-On-Bill Finance | $141,514 | $20,800 | $535,121 | $0 | $697,435 |
| 3263 | SW-FIN-ARRA Originated Financing | $24,344 | $0 | $200,880 | $2,000,000 | $2,225,224 |
| 3264 | SW-FIN-New Finance Offerings | $198,170 | $61,000 | $1,818,140 | $10,000,000 | $12,077,309 |
| | TOTAL: | $364,028 | $81,800 | $2,554,141 | $12,000,000 | $14,999,969 |

**Table 2: Total Projected Program Savings by IOU (Rough Estimate, If Possible)**

| Program Code | Program Name | Gross kW Savings | Gross kWh Savings | Gross Therm Savings |
|---|---|---|---|---|
| | **SW Finance** | | | |
| 3262 | SW-FIN-On-Bill Finance | 0 | 0 | 0 |
| 3263 | SW-FIN-ARRA Originated Financing | 2,423 | 18,900,000 | 128 |
| 3264 | SW-FIN-New Finance Offerings | 12,122 | 90,000,000 | 697 |
| | TOTAL: | 14,545 | 108,900,000 | 825 |

## 4) Short description of each subprogram (suggested word limit - 50 words/subprogram).

On-Bill Financing (OBF)

The OBF subprogram is a continuation of and improvement on the existing utility on-bill financing programs for non-residential customers. OBF offers interest-free, utility ratepayer financed, unsecured energy efficiency loans to qualified non-residential customers with qualified projects. OBF allows customers to achieve energy savings through the purchase and installation of efficient equipment. Customer loans are repaid through a fixed monthly installment on their utility bills.

American Recovery and Reinvestment Act (ARRA) Originated Financing Programs

Several financing programs were funded through ARRA and that funding will expire during 2012. The IOUs will continue to fund selected ARRA-originated programs which have been, and will continue to be, implemented by 3rd parties, local governments, and/or via the California Energy Commission. Successful ARRA-originated programs will be selected based on the following criteria:

- Potential for scalability to larger markets;
- Ability to leverage ratepayer funds with private capital
- Ability to test unique/new program design and delivery
- Ability to serve previously un-served or under-served markets

- Ability to offer low interest rates to consumers
- Effective utilization of total combined ratepayer funding support from all sources.

The utilities will provide continued funding and administrative support for the selected programs in 2013-2014 as well as in 2012 (2012 funding of between $5 and $10 million will be from the 2010-2012 statewide ME&O budget).

New Financing Offerings

These are new, scalable, and leveraged statewide financing products to be designed in 2012 to help customers produce deeper energy savings. As described above, they will also be designed to gain program experience and data on debt repayment and project energy savings. Specifically the new offerings will include:

- A credit enhancement strategy for the single-family residential market;
- A multi-family residential market strategy that includes both credit enhancement and an on-bill repayment option that may require legislative change to fully implement;
- A credit enhancement strategy for the small business market; and
- An on-bill repayment strategy for all non-residential customers.

**Sub-Program**

**Program Implementation Plan Template[2][3]**

This template has been modified to identify areas of the New PIP template that do not necessarily work for the Energy Efficiency Financing Program and sub-programs and therefore are not required to be submitted as part of the 2013-2014 applications due on July 2, 2012. The sections that are not required (unless further instruction by Energy Division) are labeled "N/A" for Not Applicable or "TBD" for To Be Determined. Areas that are recognized as being challenging for the Financing program are labeled as "Rough Estimate, If Possible." Otherwise, all other sections are required to be submitted for the Energy Efficiency Financing Program to the best of the utilities' ability.

Please note – the Program Description Narrative for the Financing program will be the most important section of this PIP and for the sub-program PIP.

1) **Sub-Program Name – On-Bill Financing**
2) **Sub-Program ID number:**
3) **Type of Sub-Program: X Core __Third Party __Partnership**
4) **Market sector or segment that this sub-program is designed to serve[4]:**

    a. __ Residential
        i. Including Low Income? __ Yes X No;
        ii. Including Moderate Income? __ Yes X No.
        iii. Including or specifically Multifamily buildings __ Yes X No.
        iv. Including or specifically Rental units? __ Yes X No.
    b. X Commercial (List applicable NAIC codes: All Commercial NAICS Codes)
    c. X Industrial (List applicable NAIC codes: All Industrial NAICS Codes)
    d. X Agricultural (List applicable NAIC codes: All Agricultural NAICS Codes)

5) **Is this sub-program primarily a:**
    a. Non-resource program ___ Yes__ No
    b. Resource acquisition program X Yes ___ No
    c. Market Transformation Program ___ Yes ___ No

6) **Indicate the primary intervention strategies:**

    a. Upstream ___ Yes X No

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[2] Subprogram descriptions shall be provided for all subprograms, by all IOUs implementing the subprogram. Narrative text shall in general be identical across these submissions. For any unique IOU-specific deviations from the agreed statewide subprogram, each IOU shall indicate narrative text unique to their IOU by bolding or underscoring the relevant text. Unless otherwise indicated, budget and other tables may be unique to each IOU..

[3] Suggested page limit for subprogram PIPs: 15 pages for each resource acquisition and non-resource sub-program, and 20 pages for each market transformation-oriented subprogram. A "sub-program" of a statewide program has: a specific name, targets a specific market sub-segment or uses a unique delivery or marketing approach not used across the entire program; has a specific budget; and, for resource programs, has specific estimated savings and demand impacts.

[4] Check all that apply

b. Midstream ___Yes X No
c. Downstream X Yes ___ No
d. Direct Install ___ Yes X No
e. Non Resource ___ Yes X No

Loan checks maybe payable to OBF contractors if customers so designate. However, in this situation, the loan proceeds represent payment from customer for work completed and not an incentive from the Utility.

**7) Projected Sub-program Total Resource Cost (TRC) and Program Administrator Cost (PAC) (Rough Estimate, If Possible)** TRC ___ PAC ___

**8) Projected Sub-Program Budget**

**Table 1. Projected Sub-Program Budget, by Calendar Year (Rough Estimate, If Possible – Components may need to be modified for financing)** [5]

| | Program Year | | |
|---|---|---|---|
| **On-Bill Financing** | **2013** | **2014** | **Total** |
| Admin ($) | | | |
| General overhead ($) | | | |
| Loan Funding ($) | | | |
| Marketing & Outreach ($) | | | |
| Education & Training | | | |
| Total Budget | | | |

**9) Sub-Program Description, Objectives and Theory**

a) **Sub-Program Description and Theory:** Clearly describe the goals of the sub-program and the sub-program theory. As part of this, describe the market barriers, specific areas of concern and/or gaps that the sub-program is designed to address. Then describe the way the sub-program will seek to address each barrier, area of concern or gap[6] (suggested work limit: 600 words per subprogram).

Statewide On-Bill Financing offers interest-free, unsecured energy efficiency loans to qualified non-residential customers with qualified projects. OBF will build on the success of the past

[5] Individual utility specific information to be provided in this table
[6] Through marketing, delivery mechanisms, information, incentives, etc. If barriers vary by market sub-sector, provide this information. As part of this, succinctly describe the role of any market actors upstream from the customer such as installers, venders, architects, etc.; indicate if and why the program approach constitutes "best practice," is "innovative" or reflects "lessons learned" in market strategies, program design and/or implementation techniques.

program cycle to allow customers to achieve energy savings through the purchase and installation of efficient equipment. Customer loans will be repaid through a fixed monthly installment on their utility bills. There is no prepayment penalty. Loans are not transferable. Partial or non-payment of loan could result in shut-off of utility service and turned over for collection. OBF funding for 2013 and 2014 will be at a level equal to or greater than the amount of OBF funding reserved by non-residential customers in 2012.

The primary market barrier that the OBF subprogram is intended to overcome is the lack of up-front capital for customers to invest in real and sustainable long-term energy cost reductions.

The 2010-2012 On-Bill Financing Process Evaluation and Market Assessment (http://www.energydataweb.com/cpucFiles/pdaDocs/846/OBF%20Final%20Report,%20May%202012.pdf) concludes that utilities should continue to offer OBF into 2013-2014 while maintaining the key features that have driven participation:

- **Reduce or eliminate customer first-cost hurdles** - by enabling qualified customers to complete energy-efficiency projects with no up-front costs, OBF eliminates one of the major barriers to participation in energy efficiency.
- **Interest-free loans -** reduces customer cost
- **Bill-neutrality** – this program design feature has proven to be an effective tool for vendors, distributors, utility account executives, and other marketing agents to encourage customers to finance necessary upgrades while reducing customer bill-impacts (average monthly energy cost savings generally are greater than monthly debt service costs).

The Statewide OBF Team has worked closely to align program features and requirements so OBF will be consistently structured and delivered across all IOUs' service territories.

- **Eligible customers -** Non-residential customers (including institutional customers) and owners of multifamily units who do not reside on the premises.
- **Credit approval** – Based on customers' account history. By reviewing the individual customers' bill payment record, utility administrators have the ability to approve loans without the added time, cost, and subjective review of a third-party credit check. The IOUs have adopted this best practice due to the historically low OBF loan defaults to date.
- **Loan term** – loan terms are up to 10 years and up to 5 years for taxpayer-funded institutional and non-institutional customers respectively. Utilities will structure loan requirements to tailor loan terms to specific types of projects under specific guidelines, allowing longer maximum loan terms for more comprehensive or deeper energy savings projects and shorter maximum loan terms for projects with shorter payback periods (e.g. lighting and low cost equipment). Specific details to be recommended by the Expert Finance Consultant.
- **Loan minimum per meter-** $5,000
- **Loan maximum per meter -** $100,000 for non-institutional customers; $250,000 for taxpayer-funded institutional customers; eligible State of California accounts may qualify up to $1,000,000

- **Relationship to rebate/incentive** – A reduction or elimination of rebates/ incentives associated with OBF projects will be phased in. 2013 will be a transition year for IOUs to analyze possible program design options and determine the most likely to succeed path. Implementation will begin in 2014. Incremental energy savings associated with OBF projects will be counted toward the loan program and not rebate/incentive programs, thus avoiding double counting.
- **Financed equipment –** All measures in an OBF project must qualify for another utility rebate/incentive program.
- **Signing of loan agreement:** Prior to project installation
- **Loan payee –** can be either customer or contractor
- **Site bundling –** allowed for taxpayer-funded institutional customers only.
- **Multi-program participation -** A single project cannot receive funds from more than one loan program supported by ratepayer dollars. For example, a small business customer receiving credit enhancement offered through the utility for a specific project will not be eligible to receive an OBF loan for the same project.
- **Co-funding loans with another utility –** utilities with bordering/overlapping service territories will work together to co-fund qualified projects to common customers that will optimize gas and electric cost savings.
- **Vendor support** – utilities will adopt vendor support guidelines and standard participation agreement to monitor performance, manage customer expectations, and set clear roles and responsibilities for all parties.

b) **Sub-Program Energy and Demand Objectives**- If this sub-program has energy and demand objective, please complete Table 2.

**Table 2. Projected Sub-Program Net Energy and Demand Impacts, by Calendar Year (Rough Estimate, If Possible)** [7]

| | Program Years | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 2013 | | | | 2014 | | | | Total |
| **On-Bill Financing** | SDG&E | SCE | SCG | PG&E | SDG&E | SCE | SCG | PG&E | |
| GWh | | | | | | | | | |
| Peak MW | | | | | | | | | |
| Therms (millions) | | | | | | | | | |

c) **Program Non-Energy Objectives**:
Track OBF project and loan performance data to contribute to the financing-related project performance and repayment database

d) **Cost Effectiveness/Market Need**: What methods will be or have been used to determine whether this program is cost-effective?[8] If this is a non-resource

[7] Individual utility specific information to be provided in this table

program, describe the literature, market assessments or other sources that indicate a need for this program.

Methods contained in the Standard Practice Manual will be used.

e) **Measure Savings/ Work Papers (Rough Estimate, If Possible)** :

a. Indicate data source for savings estimates for program measures (DEER, custom measures, etc).

b. Indicate work paper status for program measures:

**Table 4 – Work paper Status**

See Table 4 in attachment "AppendixC_2013-2014_PIPTemplate_NEWPrograms_V05Attachment.xlsx"

## 10) Program Implementation Details

a) **Timelines:** List the key program milestones and dates. An example is included below.

**Table 5:**.Sub-Program Milestones and Timeline

Table 5: Sub-Program Milestones and Timeline

| Milestone | Date |
|---|---|
| Statewide Coordination Meeting | Oct-12 |
| Statewide Vendor Participation Guidelines Completed | Nov-12 |
| Vendor training module completed | Nov-12 |
| Marketing materials completed | Feb-13 |
| Loans funded | 2/2013 – 12/2014 |
| Quarterly Progress Reports | 3/31/2013 – 12/8/2014 |

b) **Geographic Scope**: List the geographic regions (e.g., CEC weather zones) where the program will operate

**Table 6: Geographic Regions Where the Program Will Operate**

See Table 6 in attachment "AppendixC_2013-2014_PIPTemplate_NEWPrograms_V05Attachment.xlsx"

[8] If the program has energy and demand objectives, simply state that the methods contained in the Standard Practice Manual will be used. If the program does not have energy and demand objective, propose an approach to assess cost-effectiveness.

**c) Program Administration**

**Table 7: Program Administration of Program Components (Rough Estimate, If Possible)**

See Table 7 in attachment "AppendixC_2013-2014_PIPTemplate_NEWPrograms_V05Attachment.xlsx"

*[Table 7 Program Administration to be provided as an Excel Attachment to this PIP. Please see file "AppendixC_2013-2014_PIPTemplate_NEWPrograms_V05Attachment.xlsx" for table formats]* **(TBD)**

**d) Program Eligibility Requirements (TBD) :**

i. **Customers:** List any customer eligibility requirements (e.g., annual energy use, peak kW demand) **(TBD)**:

**Table 8: Customer Eligibility Requirements (Joint Utility Table) (TBD)**

*[Table 8 Customer Eligibility Requirements to be provided as an Excel Attachment to this PIP. Please see file "AppendixC_2013-2014_PIPTemplate_NEWPrograms_V05Attachment.xlsx" for table formats]* **(TBD)**

ii. **Contractors/Participants:** List any contractor (and/or developer, manufacturer, retailer or other "participant") eligibility requirements (e.g. specific IOU required trainings; specific contractor accreditations; and/or, specific technician certifications required). **(TBD)**

**Table 9: Contractor/Participant Eligibility Requirements (Joint Utility Table) (TBD)**

*[Table 9 Customer Eligibility Requirements to be provided as an Excel Attachment to this PIP. Please see file "AppendixC_2013-2014_PIPTemplate_NEWPrograms_V05Attachment.xlsx" for table formats]* **(TBD)**

e) **Program Partners (TBD):**

a. **Manufacturer/Retailer/Distributor partners:** For upstream or midstream incentive and/or buy down programs indicate[9]: **(TBD)**

[9] Provide in a consistent format for all IOUs. Indicate program partners across all IOU territories in one table or spreadsheet. Append to end of PIP.

**Table 10: Manufacturer/Retailer/Distributor Partners (N/A)**

*[Table 10 Manufacturer/Retailer/Distributor/Partners to be provided as an Excel Attachment to this PIP. Please see file "AppendixC_2013-2014_PIPTemplate_NEWPrograms_V05Attachment.xlsx" for table formats]* **(N/A)**

b. **Other key program partners**: Indicate any research or other key program partners:
   Key partners include:
   - Industry contractors/vendors
   - Business Improvement Districts
   - Chambers of Commerce
   - Statewide and Local Government Utility Partners
   - Program Advisory Group and subcommittees
   - Process Evaluation Stakeholders and other participants
   - Loan administrators
   - Financial Institutions[10]

f) **Measures and incentive levels**: E3 calculators will provide the list of measures and incentive levels to be provided via the program. In this section the utilities should provide a summary table of measures and incentive levels. **(Rough Estimate, If Possible)**

**Table 11: Summary Table of Measures, Incentive Levels and Verification Rates (Rough Estimate, If Possible)**

*[Table 11 Summary Table of Measures, Incentive Levels and Verification Rates to be provided as an Excel Attachment to this PIP. Please see file "AppendixC_2013-2014_PIPTemplate_NEWPrograms_V05Attachment.xlsx" for table formats]* **(Rough Estimate, If Possible)**

a. Use a single excel spreadsheet to indicate the eligible measures for the program across all IOUs. Indicate the expected incentive level by measure or measure grouping for each IOU, making clear where these vary. **(Rough Estimate, If Possible)**
b. For each incented or rebated measure, indicate the market actor to whom this will be provided. **(Rough Estimate, If Possible)**

g) **Additional Services:** List additional services that the sub-program will provide, to which market actors.

[10] Financial Institutions may be interested in purchasing OBF loans from IOU's

This subprogram coordinates with commercial, industrial, and agricultural calculated sub programs that offer free energy audits, energy savings assessments, and information on other utility programs to program participants.

a. For each service provided, indicate any expected charges to market actors of the services, and/or the level at which any such services will be incented or funded.

These services are offered to program participants free of charge.

**Table 12: Additional Services**

See Table 12 in attachment "AppendixC_2013-2014_PIPTemplate_NEWPrograms_V05Attachment.xlsx"

h) **Sub-Program Specific Marketing and Outreach:** Please describe, providing timelines (suggested word limit: 300 words)

OBF marketing and outreach is performed through various channels including vendors, account executives, workforce education & training, IOU web-site outreach, CPUC web-site outreach, and utility energy efficiency marketing & outreach groups. As the utilities move towards a more uniform approach to OBF, a marketing plan will be developed in late 2012 to collaborate on a consistent strategy, message, and tactics that will serve the key stakeholders in each of the IOU service territories. Utilities with bordering/overlapping service territories will work together to develop and provide joint marketing approaches targeting integrated electric and gas savings opportunities. A key challenge will be coordination with the to-be-determined ARRA-originated financing programs and the two non-residential pilots.

i) **Sub-Program Specific Training:** Please describe, providing timelines (suggested word limit: 300 words)

IOUs will adopt best practices and recommendations to provide quarterly training for key market actors for OBF as well as additional program-appropriate modules. The training may include customer forums, Technology Center classroom trainings, Contractor forums, and Webinars. Training content will include:

- Program overview and requirements
- Customer & project eligibility
- Calculation of project scope
- Program application steps and requirements
- Application process and communications
- Vendor Participation Agreement guidelines
- OBF best practices and case studies

- Other Demand Side Management and Self-Generation program offerings – e.g. Direct Install, Rebates, Incentives, Demand Response, and California Solar Initiative programs.

j) **Sub-Program Software and/or Additional Tools:**

a. List all eligible software or similar tools required for sub-program participation. **(Rough Estimate, If Possible)**
b. Indicate if pre and/or post implementation audits will be required for the sub-program. ___ Yes ___ No **(TBD)**
   Pre-implementation audit required X Yes ___ No
   Post-implementation audit required ___ Yes X No
c. As applicable, indicate levels at which such audits shall be rebated or funded, and to whom such rebates/funding will be provided (i.e. to customer or contractor). **(Rough Estimate, If Possible)**

   An on-site energy audit for OBF participants is free of charge

**Table 13: Post-implementation Audits (Rough Estimate, If Possible)**

*[Table 13 Program Related Audits to be provided as an Excel Attachment to this PIP. Please see file "AppendixC_2013-2014_PIPTemplate_NEWPrograms_V05Attachment.xlsx" for table formats]*
**(Rough Estimate, If Possible)**

**k) Sub-Program Quality Assurance Provisions:** Please list quality assurance, quality control, including accreditations/certification or other credentials **(TBD)**

**Table 14: Quality Assurance Provisions (TBD)**

*[Table 14 Quality Assurance Provisions to be provided as an Excel Attachment to this PIP. Please see file "AppendixC_2013-2014_PIPTemplate_NEWPrograms_V05Attachment.xlsx" for table formats]* **(TBD)**

l) **Sub-program Delivery Method and Measure Installation /Marketing or Training:** Briefly describe any additional sub-program delivery and measure installation and/or marketing & outreach, training and/or other services provided, if not yet described above.

Measure installation will be performed by a licensed contractor of the customers' choosing. OBF is delivered through contractors/vendors as well as utility account executives. Contractors/vendors who are paid through OBF loan funds will be required to attend training and sign a Vendor Participation Agreement. IOUs are exploring the development of a statewide Vendor Participation Agreement to align all programs for vendors who participate throughout the State.

**m)** **Sub-program Process Flow Chart:** Provide a sub-program process flow chart that describes the administrative and procedural components of the sub-program. For example, the flow chart might describe a customer's submittal of an application, the screening of the application, the approval/disapproval of an application, verification of purchase or installation, the processing and payment of incentives, and any quality control activities. **(TBD)**

**n)** **Cross-cutting Sub-program and Non-IOU Partner Coordination:** Indicate other IOU EE, DR or DG sub-programs with which this sub-program will regularly coordinate. Indicate also key non-IOU coordination partners. Indicate expected coordination mechanisms[11] and frequency[12]:

**Table 15: Cross-cutting Sub-program and Non-IOU Partner Coordination (TBD)**

*[Table 15 Cross-cutting Sub-program and Non-IOU Partner Coordination to be provided as an Excel Attachment to this PIP. Please see file "AppendixC_2013-2014_PIPTemplate_NEWPrograms_V05Attachment.xlsx" for table formats]*

o) **Logic Model:** Please append the logic model for this sub-program to the end of this PIP. Describe here any additional underlying theory supporting the sub-program intervention approach, referring as needed to the relevant literature (e.g., past evaluations, best practices documents, journal articles, books, etc.). **(TBD)**

## 11) Additional Sub-Program Information

a) **Advancing Strategic Plan Goals and Objectives**: Describe how sub-program advances the goals, strategies and objectives of the California Long Term Energy Efficiency Strategic Plan (word limit: 150 words)

On-Bill Financing is designed to facilitate the adoption of energy efficiency by removing one of the major barriers to participation – up-front costs. By allowing customers to finance upgrades, OBF advances the objectives of the California Long Term Strategic Plan; specifically, the commercial programmatic goal of zero net energy by 2030.

[11] "Mechanisms" refers to communication methods (i.e. quarterly meetings; internal list serves; monthly calls, etc.) and/or any cross-program review methods (i.e., feedback on program plans; sign off on policies, etc). or harmonization techniques (i.e. consistent certification requirements across programs, program participant required cross trainings, etc).
[12] This does not mean there would be mutual understanding of the on the mechanism or a known frequency of coordination; rather, just provide enough information to give a general sense of the coordinate efforts.

Additionally, OBF enables customers to take a holistic approach to projects and acts as a catalyst to implement improvements regardless of capital improvement budgets or schedules constraints. This holistic approach supports the 3rd of the Big Bold Strategies by funding HVAC measures in order to facilitate market transformation so that its energy performance is optimal for California.

**b) Integration (TBD)**

i. **Integrated/coordinated Demand Side Management**: As applicable, describe how sub-program will promote customer education and sub-program participation across all DSM options. Provide budget information of non-EE sub-programs where applicable. **(TBD)**

**Table 16: Non-EE Sub-Program Information (TBD)**

*[Table 16 Non-EE Sub-Program Information to be provided as an Excel Attachment to this PIP. Please see file "AppendixC_2013-2014_PIPTemplate_NEWPrograms_V05Attachment.xlsx" for table formats]*

ii. **Integration across resource types** (energy, water, air quality, etc): If sub-program aims to integrate across resources types, please provide rationale and general approach. **(TBD)**

*[This information can be found in Table 16 Non-EE Sub-Program Information to be provided as an Excel Attachment to this PIP. Please see file "AppendixC_2013-2014_PIPTemplate_NEWPrograms_V05Attachment.xlsx" for table formats]* **(TBD)**

c) **Leveraging of Resources**: Please describe if the subprogram will leverage additional investments by market actors or other state, local or federal agencies. **(TBD)**

d) **Trials/ Pilots:** Please describe any trials or pilot projects planned for this sub-program **(TBD)**

e) **Knowledge Transfer:** Describe the strategy that will be used to identify and disseminate best practices and lessons learned from this sub-program **(TBD)**

12) **Market Transformation Information**: For programs identified as market transformation programs, include the following (suggested page limit- five pages): **(TBD)**

i. A summary of the market transformation objectives of the program. **(TBD)**
ii. A description of the market, including identification of the relevant market actors and the relationships among them; **(TBD)**

iii. A market characterization and assessment of the relationships/dynamics among market actors, including identification of the key barriers and opportunities to advance demand side management technologies and strategies; **(TBD)**
iv. A description of the proposed intervention(s) and its/their intended results, and specify which barriers the intervention is intended to address; **(TBD)**
v. A coherent program, or "market," logic model that ensures a solid causal relationship between the proposed intervention(s) and its/their intended results[13]; **(TBD)**
vi. Appropriate evaluation plans and corresponding Market Transformation indicators and Program Performance Metrics based on the program logic model. **(TBD)**

13) **Additional information as required by Commission decision or ruling or as needed:** Include here additional information as required by Commission decision or ruling (As applicable. Indicate decision or ruling and page numbers):

[13] If this logic model is the same as that requested in #10.(O), only provide once. As needed, provide a more detailed logic model emphasizing the market transformation elements of the program and/or how such elements integrate with resource acquisition elements.

## ATTACHMENT 1

### Program Non-Energy Objectives

For New or Substantially changed programs and sub-programs, provide the following information for Program Non-Energy Objectives and follow the format used for the previous cycle Program Performance Metrics found in Resolution E-4385.

i. List the primary SMART[14] non-energy objectives of the program. These should correspond to key methods identified above to overcome the market barriers, areas of concern or gaps, and to the outputs and short, mid- and long-term non-energy outcomes identified in the logic model requested below. **(Rough Estimate, If Possible)**

   Track OBF project and loan performance data to contribute to the financing-related project performance and repayment database.

ii. For each SMART objective, identify the quantitative targets, direction or percent of change that you hope to achieve during the program cycle.[15] **(Rough Estimate, If Possible)**

iii. For each proposed SMART objective, describe any relevant baseline data on current market conditions that you have assembled or plan to assemble and the sources. **(Rough Estimate, If Possible)**

iv. **Quantitative program targets (PPMs) (Rough Estimate, If Possible):** If not already provided above, indicate estimates of the number of measure units, buildings, etc. projected to be treated by the sub-program.

**Table 3. Quantitative Program Targets (PPMs)**

*[Table 3 Quantitative Program Targets (PPMs) to be provided as an Excel Attachment to this PIP. Please see file "AppendixC_2013-2014_PIPTemplate_NEWPrograms_V05Attachment.xlsx" for table formats]*

[14] A SMART objective is one that is **S**pecific (i.e. quantitative and quantifiable generally, in terms of the results to be achieved**), M**easurable, **A**mbitious, **R**ealistic, and **T**ime-bound. For example, for a vender training component of an innovative commercial program, two SMART mid-term objectives and one long-term objective might be:

a) During the period 2013-2014, the number of HVAC installers in the SCE service territory who are able to perform quality installations of energy efficient packaged air conditioners will increase by 20%.
b) During the period 2013-2014, the number of installations of energy efficient packaged air conditions in the SCE service territory that are considered quality installations will increase by 25%.
c) By 2020, installations of energy efficient packaged air conditions in the SCE service territory that are considered quality installations will increase by 75%.

[15] Please also add any new program objectives and quantitative targets for statewide programs to the portfolio PPM/MTI reporting template.

**Sub-Program**

**Program Implementation Plan Template[16][17]**

This template has been modified to identify areas of the New PIP template that do not necessarily work for the Energy Efficiency Financing Program and sub-programs and therefore are not required to be submitted as part of the 2013-2014 applications due on July 2, 2012. The sections that are not required (unless further instruction by Energy Division) are labeled "N/A" for Not Applicable or "TBD" for To Be Determined. Areas that are recognized as being challenging for the Financing program are labeled as "Rough Estimate, If Possible." Otherwise, all other sections are required to be submitted for the Energy Efficiency Financing Program to the best of the utilities' ability.

Please note – the Program Description Narrative for the Financing program will be the most important section of this PIP and for the sub-program PIP.

1) **Sub-Program Name –** American Recovery and Reinvestment Act (ARRA) Originated Financing Programs

2) **Sub-Program ID number:**
3) **Type of Sub-Program: X Core __Third Party __Partnership**
4) **Market sector or segment that this sub-program is designed to serve[18]:**

   a. X Residential
      i. Including Low Income? X Yes __ No;
      ii. Including Moderate Income? X Yes __ No.
      iii. Including or specifically Multifamily buildings X Yes __ No.
      iv. Including or specifically Rental units? X Yes __ No.
   b. X Commercial (List applicable NAIC codes: ____TBD_____)
   c. X Industrial (List applicable NAIC codes: _____TBD_____)
   d. X Agricultural (List applicable NAIC codes: _____TBD_____)

5) **Is this sub-program primarily a:**

[16] Subprogram descriptions shall be provided for all subprograms, by all IOUs implementing the subprogram. Narrative text shall in general be identical across these submissions. For any unique IOU-specific deviations from the agreed statewide subprogram, each IOU shall indicate narrative text unique to their IOU by bolding or underscoring the relevant text. Unless otherwise indicated, budget and other tables may be unique to each IOU..

[17] Suggested page limit for subprogram PIPs: 15 pages for each resource acquisition and non-resource sub-program, and 20 pages for each market transformation-oriented subprogram. A "sub-program" of a statewide program has: a specific name, targets a specific market sub-segment or uses a unique delivery or marketing approach not used across the entire program; has a specific budget; and, for resource programs, has specific estimated savings and demand impacts.

[18] Check all that apply

a. Non-resource program ___ Yes__ No
b. Resource acquisition program _X_ Yes ___ No
c. Market Transformation Program ___ Yes ___ No

**6) Indicate the primary intervention strategies:**

a. Upstream ___ Yes __X_ No
b. Midstream ___ Yes _X__ No
c. Downstream _X__ Yes ___ No
d. Direct Install __ Yes _X_ No.
e. Non Resource __ Yes _X_ No.

**7) Projected Sub-program Total Resource Cost (TRC) and Program Administrator Cost (PAC) (Rough Estimate, If Possible)** TRC ___ PAC ___

**8) Projected Sub-Program Budget**

**Table 3. Projected Sub-Program Budget, by Calendar Year (Rough Estimate, If Possible – Components may need to be modified for financing)** [19]

| | Program Year | | |
|---|---|---|---|
| **ARRA-originated Financing Programs** | **2013** | **2014** | **Total** |
| IOU Admin-Oversight of ARRA Continuation Programs ($) | | | |
| IOU General overhead ($) | | | |
| ARRA Finance Product Funding ($) | | | |
| ARRA Program Administrator Funding- Admin, Mkting, and Development ($) | | | |
| Total Budget | | | |

**9) Sub-Program Description, Objectives and Theory**

a) **Sub-Program Description and Theory:** Clearly describe the goals of the sub-program and the sub-program theory. As part of this, describe the market barriers, specific areas of concern and/or gaps that the sub-program is designed to address.

[19] Individual utility specific information to be provided in this table

Then describe the way the sub-program will seek to address each barrier, area of concern or gap[20] (suggested work limit: 600 words per subprogram).

The utilities will set aside a specific amount of funding and required administrative support for continuing and augmenting previously ARRA-funded programs that can help establish California energy project and loan performance records. Selected programs will be evaluated against success criteria, as set forth in Section 5.3.2 (p.112 and 113) of the Decision and IOUs' developed criteria:

1. Administrative funding (target<10%) versus Finance Product funding
2. Coordination with and enhancement of utility Whole House programs to increase customer participation
3. Demonstrated ability to serve eligible IOU customers
4. Minimal duplication of same or similar finance products within the same geographic area

As the IOUs have communicated and met with ARRA Finance Program funding recipients, it is evident that there are different needs among current ARRA Finance Program participants

1. Some wish to continue existing programs,
2. Some wish to modify existing programs, or
3. Some wish to apply remaining or available resources to enhanced or proposed programs.

In many cases, ARRA Finance Program recipients have not exhausted initial ARRA funding, but seeking additional funding to leverage or enhance current ARRA-funded programs. In the IOUs' evaluation of successful ARRA Finance programs, they are considering all requests for ARRA Finance Program continuation and evaluating these against CPUC success criteria and IOU criteria.

The primary goal of this subprogram is to continue developing loan and project performance data and experience to share with larger capital market players to ensure their confidence in both debt repayment behavior and the cash flow profile of energy savings associated with the projects

For 2012, the utilities will commit $5-$10 Million to selected ARRA Finance programs no later than August 1, 2012.

b) **Sub-Program Energy and Demand Objectives**- If this sub-program has energy and demand objective, please complete Table 2.

[20] Through marketing, delivery mechanisms, information, incentives, etc. If barriers vary by market sub-sector, provide this information. As part of this, succinctly describe the role of any market actors upstream from the customer such as installers, venders, architects, etc.; indicate if and why the program approach constitutes "best practice," is "innovative" or reflects "lessons learned" in market strategies, program design and/or implementation techniques.

**Table 4. Projected Sub-Program Net Energy and Demand Impacts, by Calendar Year (Rough Estimate, If Possible)** [21]

| | Program Years | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 2013 | | | | 2014 | | | | Total |
| **ARRA-originated Financing Programs** | SDG&E | SCE | SCG | PG&E | SDG&E | SCE | SCG | PG&E | |
| GWh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Peak MW | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Therms (millions) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

It is not feasible to develop energy savings for these programs as IOUs have no experience with these program elements. Additionally, it is assumed that a number of the measures to be installed may not be eligible for a rebate/incentive and therefore will need to be treated as "custom measures".

c) **Program Non-Energy Objectives**:

Continue developing loan and project performance data and experience to share with larger capital market players to ensure their confidence in both debt repayment behavior and the cash flow profile of energy savings associated with the projects.

*[Please refer to Attachment A of this template for instructions on how to provide Non-Energy Objectives]*

d) **Cost Effectiveness/Market Need**: What methods will be or have been used to determine whether this program is cost-effective?[22] If this is a non-resource program, describe the literature, market assessments or other sources that indicate a need for this program.

The methods contained in the Standard Practice Manual will be used.

e) **Measure Savings/ Work Papers (Rough Estimate, If Possible)**: Measure level impacts to be developed upon completion of ARRA program selection and finalization of energy savings estimation evaluation criteria for Finance Programs.

a. Indicate data source for savings estimates for program measures (DEER, custom measures, etc).

[21] Individual utility specific information to be provided in this table

[22] If the program has energy and demand objectives, simply state that the methods contained in the Standard Practice Manual will be used. If the program does not have energy and demand objective, propose an approach to assess cost-effectiveness.

CPUC approved measures as set forth in DEER, and CPUC approved customized and deemed measures, and other eligible measures, as designated by the CPUC.

b. Indicate work paper status for program measures:

**Table 4 – Work paper Status**

*[Table 4 Work paper Status to be provided as an Excel Attachment to this PIP. Please see file "AppendixC_2013-2014_PIPTemplate_NEWPrograms_V05Attachment.xlsx" for table formats]*

## 10) Program Implementation Details

a) **Timelines:** List the key program milestones and dates. An example is included below.

Table 5: Sub-Program Milestones and Timeline (example)

| Milestone | Date |
|---|---|
| Commitment of $5-$10 Million to Selected ARRA Finance Programs | August 2012 |
| Research and Evaluation of ARRA Program Funding Continuation for 2013 and 2014 | June-July 2012 |
| Selection of Specific ARRA Program Funding Continuation and Amounts for 2013-2014 | August-Sept 2012 |
| Commitment of Budgeted 2013-2014 ARRA Finance Continuation funding completed | No Later than December 2012 |
| Funding of ARRA-Originated Finance Programs | January 2013-December 2014 |

**Table 5:** Sub-Program Milestones and Timeline (example)

b) **Geographic Scope**: List the geographic regions (e.g., CEC weather zones) where the program will operate

To be determined based upon ARRA Program Selection

**Table 6: Geographic Regions Where the Program Will Operate**

**c) Program Administration**

**Table 7: Program Administration of Program Components (Rough Estimate, If Possible)**

*[Table 7 Program Administration to be provided as an Excel Attachment to this PIP. Please see file "AppendixC_2013-2014_PIPTemplate_NEWPrograms_V05Attachment.xlsx" for table formats]* **(TBD)**

**d) Program Eligibility Requirements (TBD) :**

**i. Customers:** List any customer eligibility requirements (e.g., annual energy use, peak kW demand) **(TBD)**:

**Table 8: Customer Eligibility Requirements (Joint Utility Table) (TBD)**

*[Table 8 Customer Eligibility Requirements to be provided as an Excel Attachment to this PIP. Please see file "AppendixC_2013-2014_PIPTemplate_NEWPrograms_V05Attachment.xlsx" for table formats]* **(TBD)**

**ii. Contractors/Participants:** List any contractor (and/or developer, manufacturer, retailer or other "participant") eligibility requirements (e.g. specific IOU required trainings; specific contractor accreditations; and/or, specific technician certifications required). **(TBD)**

**Table 9: Contractor/Participant Eligibility Requirements (Joint Utility Table) (TBD)**

*[Table 9 Customer Eligibility Requirements to be provided as an Excel Attachment to this PIP. Please see file "AppendixC_2013-2014_PIPTemplate_NEWPrograms_V05Attachment.xlsx" for table formats]* **(TBD)**

e) **Program Partners (TBD):**

Local Governments, Non-Government Organizations (NGO's), and private sector ARRA program administrators.

a. **Manufacturer/Retailer/Distributor partners:** For upstream or midstream incentive and/or buy down programs indicate[23]: **(TBD)**

**Table 10: Manufacturer/Retailer/Distributor Partners (N/A)**

*[Table 10 Manufacturer/Retailer/Distributor/Partners to be provided as an Excel Attachment to this PIP. Please see file "AppendixC_2013-2014_PIPTemplate_NEWPrograms_V05Attachment.xlsx" for table formats]* **(N/A)**

b. **Other key program partners**: Indicate any research or other key program partners:

[23] Provide in a consistent format for all IOUs. Indicate program partners across all IOU territories in one table or spreadsheet. Append to end of PIP.

Selected Expert Finance Consultant.

f) **Measures and incentive levels**: E3 calculators will provide the list of measures and incentive levels to be provided via the program. In this section the utilities should provide a summary table of measures and incentive levels. **(Rough Estimate, If Possible)**

Energy and Demand Impacts and underlying measure estimates to be developed upon completion of ARRA program selection and finalization of energy savings estimation evaluation criteria for Finance Programs.

**Table 11: Summary Table of Measures, Incentive Levels and Verification Rates (Rough Estimate, If Possible)**

*[Table 11 Summary Table of Measures, Incentive Levels and Verification Rates to be provided as an Excel Attachment to this PIP. Please see file "AppendixC_2013-2014_PIPTemplate_NEWPrograms_V05Attachment.xlsx" for table formats]*
**(Rough Estimate, If Possible)**

a. Use a single excel spreadsheet to indicate the eligible measures for the program across all IOUs. Indicate the expected incentive level by measure or measure grouping for each IOU, making clear where these vary. **(Rough Estimate, If Possible)**
b. For each incented or rebated measure, indicate the market actor to whom this will be provided. **(Rough Estimate, If Possible)**

g) **Additional Services:** List additional services that the sub-program will provide, to which market actors.

a. For each service provided, indicate any expected charges to market actors of the services, and/or the level at which any such services will be incented or funded.
   To be determined based upon ARRA Program Selection

**Table 12: Additional Services**

*[Table 12 Additional Services to be provided as an Excel Attachment to this PIP. Please see file "AppendixC_2013-2014_PIPTemplate_NEWPrograms_V05Attachment.xlsx" for table formats]*

h) **Sub-Program Specific Marketing and Outreach:** Please describe, providing timelines (suggested word limit: 300 words)

To be determined based upon ARRA Program Selection and to be performed by ARRA Program Administrator.

i) **Sub-Program Specific Training:** Please describe, providing timelines (suggested word limit: 300 words)

To be determined based upon ARRA Program Selection and to be performed by ARRA Program Administrator.

j) **Sub-Program Software and/or Additional Tools:**

To be determined based upon ARRA Program Selection and to be performed by ARRA Program Administrator.

a. List all eligible software or similar tools required for sub-program participation. **(Rough Estimate, If Possible)**
b. Indicate if pre and/or post implementation audits will be required for the sub-program. ___ Yes ___ No **(TBD)**
   Pre-implementation audit required ___ Yes ___ No
   Post-implementation audit required ___ Yes ___ No
c. As applicable, indicate levels at which such audits shall be rebated or funded, and to whom such rebates/funding will be provided (i.e. to customer or contractor). **(Rough Estimate, If Possible)**

**Table 13: Post-implementation Audits (Rough Estimate, If Possible)**

To be determined based upon ARRA Program Selection and to be performed by ARRA Program Administrator.

*[Table 13 Program Related Audits to be provided as an Excel Attachment to this PIP. Please see file "AppendixC_2013-2014_PIPTemplate_NEWPrograms_V05Attachment.xlsx" for table formats]*
**(Rough Estimate, If Possible)**

**k)** **Sub-Program Quality Assurance Provisions:** Please list quality assurance, quality control, including accreditations/certification or other credentials **(TBD)**

**Table 14: Quality Assurance Provisions (TBD)**

*[Table 14 Quality Assurance Provisions to be provided as an Excel Attachment to this PIP. Please see file "AppendixC_2013-2014_PIPTemplate_NEWPrograms_V05Attachment.xlsx" for table formats]* **(TBD)**

l) **Sub-program Delivery Method and Measure Installation /Marketing or Training:** Briefly describe any additional sub-program delivery and measure

installation and/or marketing & outreach, training and/or other services provided, if not yet described above.

To be determined based upon ARRA Program Selection and to be performed by ARRA Program Administrator.

**m) Sub-program Process Flow Chart:** Provide a sub-program process flow chart that describes the administrative and procedural components of the sub-program. For example, the flow chart might describe a customer's submittal of an application, the screening of the application, the approval/disapproval of an application, verification of purchase or installation, the processing and payment of incentives, and any quality control activities. **(TBD)**

**n) Cross-cutting Sub-program and Non-IOU Partner Coordination:** Indicate other IOU EE, DR or DG sub-programs with which this sub-program will regularly coordinate. Indicate also key non-IOU coordination partners. Indicate expected coordination mechanisms[24] and frequency[25]: **(Rough Estimate, If Possible)**

**Table 15: Cross-cutting Sub-program and Non-IOU Partner Coordination (TBD)**

*[Table 15 Cross-cutting Sub-program and Non-IOU Partner Coordination to be provided as an Excel Attachment to this PIP. Please see file "AppendixC_2013-2014_PIPTemplate_NEWPrograms_V05Attachment.xlsx" for table formats]*

o) **Logic Model:** Please append the logic model for this sub-program to the end of this PIP. Describe here any additional underlying theory supporting the sub-program intervention approach, referring as needed to the relevant literature (e.g., past evaluations, best practices documents, journal articles, books, etc.). **(TBD)**

## 11) Additional Sub-Program Information

a) **Advancing Strategic Plan Goals and Objectives**: Describe how sub-program advances the goals, strategies and objectives of the California Long Term Energy Efficiency Strategic Plan (word limit: 150 words)

**b) Integration (TBD)**

[24] "Mechanisms" refers to communication methods (i.e. quarterly meetings; internal list serves; monthly calls, etc.) and/or any cross-program review methods (i.e., feedback on program plans; sign off on policies, etc). or harmonization techniques (i.e. consistent certification requirements across programs, program participant required cross trainings, etc).

[25] This does not mean there would be mutual understanding of the on the mechanism or a known frequency of coordination; rather, just provide enough information to give a general sense of the coordinate efforts.

i. **Integrated/coordinated Demand Side Management**: As applicable, describe how sub-program will promote customer education and sub-program participation across all DSM options. Provide budget information of non-EE sub-programs where applicable. **(TBD)**

**Table 16: Non-EE Sub-Program Information (TBD)**

*[Table 16 Non-EE Sub-Program Information to be provided as an Excel Attachment to this PIP. Please see file "AppendixC_2013-2014_PIPTemplate_NEWPrograms_V05Attachment.xlsx" for table formats]*

ii. **Integration across resource types** (energy, water, air quality, etc): If sub-program aims to integrate across resources types, please provide rationale and general approach. **(TBD)**

*[This information can be found in Table 16 Non-EE Sub-Program Information to be provided as an Excel Attachment to this PIP. Please see file "AppendixC_2013-2014_PIPTemplate_NEWPrograms_V05Attachment.xlsx" for table formats]* **(TBD)**

c) **Leveraging of Resources**: Please describe if the subprogram will leverage additional investments by market actors or other state, local or federal agencies. **(TBD)**

d) **Trials/ Pilots:** Please describe any trials or pilot projects planned for this sub-program **(TBD)**

e) **Knowledge Transfer:** Describe the strategy that will be used to identify and disseminate best practices and lessons learned from this sub-program **(TBD)**

12) **Market Transformation Information**: For programs identified as market transformation programs, include the following (suggested page limit- five pages): Not a Market Transformation Program

i. A summary of the market transformation objectives of the program. **(TBD)**
ii. A description of the market, including identification of the relevant market actors and the relationships among them; **(TBD)**
iii. A market characterization and assessment of the relationships/dynamics among market actors, including identification of the key barriers and opportunities to advance demand side management technologies and strategies; **(TBD)**
iv. A description of the proposed intervention(s) and its/their intended results, and specify which barriers the intervention is intended to address; **(TBD)**

v. A coherent program, or "market," logic model that ensures a solid causal relationship between the proposed intervention(s) and its/their intended results[26]; **(TBD)**

vi. Appropriate evaluation plans and corresponding Market Transformation indicators and Program Performance Metrics based on the program logic model. **(TBD)**

13) **Additional information as required by Commission decision or ruling or as needed:** Include here additional information as required by Commission decision or ruling (As applicable. Indicate decision or ruling and page numbers):

[26] If this logic model is the same as that requested in #10.(O), only provide once. As needed, provide a more detailed logic model emphasizing the market transformation elements of the program and/or how such elements integrate with resource acquisition elements.

## ATTACHMENT 1

### Program Non-Energy Objectives

For New or Substantially changed programs and sub-programs, provide the following information for Program Non-Energy Objectives and follow the format used for the previous cycle Program Performance Metrics found in Resolution E-4385.

i. List the primary SMART[27] non-energy objectives of the program. These should correspond to key methods identified above to overcome the market barriers, areas of concern or gaps, and to the outputs and short, mid- and long-term non-energy outcomes identified in the logic model requested below. **(Rough Estimate, If Possible)**

ii. For each SMART objective, identify the quantitative targets, direction or percent of change that you hope to achieve during the program cycle.[28] **(Rough Estimate, If Possible)**

iii. For each proposed SMART objective, describe any relevant baseline data on current market conditions that you have assembled or plan to assemble and the sources. **(Rough Estimate, If Possible)**

iv. **Quantitative program targets (PPMs) (Rough Estimate, If Possible):** If not already provided above, indicate estimates of the number of measure units, buildings, etc. projected to be treated by the sub-program.

**Table 3. Quantitative Program Targets (PPMs)**

*[Table 3 Quantitative Program Targets (PPMs) to be provided as an Excel Attachment to this PIP. Please see file "AppendixC_2013-2014_PIPTemplate_NEWPrograms_V05Attachment.xlsx" for table formats]*

[27] A SMART objective is one that is **S**pecific (i.e. quantitative and quantifiable generally, in terms of the results to be achieved**), M**easurable, **A**mbitious, **R**ealistic, and **T**ime-bound. For example, for a vender training component of an innovative commercial program, two SMART mid-term objectives and one long-term objective might be:

d) During the period 2013-2014, the number of HVAC installers in the SCE service territory who are able to perform quality installations of energy efficient packaged air conditioners will increase by 20%.
e) During the period 2013-2014, the number of installations of energy efficient packaged air conditions in the SCE service territory that are considered quality installations will increase by 25%.
f) By 2020, installations of energy efficient packaged air conditions in the SCE service territory that are considered quality installations will increase by 75%.

[28] Please also add any new program objectives and quantitative targets for statewide programs to the portfolio PPM/MTI reporting template.

**Sub-Program**

## Program Implementation Plan Template[29][30]

This template has been modified to identify areas of the New PIP template that do not necessarily work for the Energy Efficiency Financing Program and sub-programs and therefore are not required to be submitted as part of the 2013-2014 applications due on July 2, 2012. The sections that are not required (unless further instruction by Energy Division) are labeled "N/A" for Not Applicable or "TBD" for To Be Determined. Areas that are recognized as being challenging for the Financing program are labeled as "Rough Estimate, If Possible." Otherwise, all other sections are required to be submitted for the Energy Efficiency Financing Program to the best of the utilities' ability.

Please note – the Program Description Narrative for the Financing program will be the most important section of this PIP and for the sub-program PIP.

1) **Sub-Program Name –** New Financing Offerings
2) **Sub-Program ID number:**
3) **Type of Sub-Program: X Core __Third Party __Partnership**
4) **Market sector or segment that this sub-program is designed to serve[31]:**

    a. X Residential
        i. Including Low Income? X Yes __ No;
        ii. Including Moderate Income? X Yes __ No.
        iii. Including or specifically Multifamily buildings X Yes __ No.
        iv. Including or specifically Rental units? X Yes __ No.
    b. X Commercial (List applicable NAIC codes: _____)
    c. X Industrial (List applicable NAIC codes: _____)
    d. X Agricultural (List applicable NAIC codes: _____)

5) **Is this sub-program primarily a:**
    a. Non-resource program ___ Yes__ No
    b. Resource acquisition program X Yes ___ No
    c. Market Transformation Program ___ Yes ___ No

6) **Indicate the primary intervention strategies:**

---

[29] Subprogram descriptions shall be provided for all subprograms, by all IOUs implementing the subprogram. Narrative text shall in general be identical across these submissions. For any unique IOU-specific deviations from the agreed statewide subprogram, each IOU shall indicate narrative text unique to their IOU by bolding or underscoring the relevant text. Unless otherwise indicated, budget and other tables may be unique to each IOU..

[30] Suggested page limit for subprogram PIPs: 15 pages for each resource acquisition and non-resource sub-program, and 20 pages for each market transformation-oriented subprogram. A "sub-program" of a statewide program has: a specific name, targets a specific market sub-segment or uses a unique delivery or marketing approach not used across the entire program; has a specific budget; and, for resource programs, has specific estimated savings and demand impacts.

[31] Check all that apply

a. Upstream ___ Yes X No
b. Midstream ___Yes X No
c. Downstream X Yes ___ No
d. Direct Install ___ Yes X No
e. Non Resource ___ Yes X No

**7) Projected Sub-program Total Resource Cost (TRC) and Program Administrator Cost (PAC) (Rough Estimate, If Possible)** TRC ___ PAC ___

**8) Projected Sub-Program Budget**

**Table 5. Projected Sub-Program Budget, by Calendar Year (Rough Estimate, If Possible – Components may need to be modified for financing)** [32]

| | Program Year | | |
|---|---|---|---|
| **New Financing Offerings** | **2013** | **2014** | **Total** |
| Admin ($) | | | |
| General overhead ($) | | | |
| Loan Funding ($) | | | |
| Marketing & Outreach ($) | | | |
| Education & Training | | | |
| Total Budget | | | |

**9) Sub-Program Description, Objectives and Theory**

a) **Sub-Program Description and Theory:** Clearly describe the goals of the sub-program and the sub-program theory. As part of this, describe the market barriers, specific areas of concern and/or gaps that the sub-program is designed to address. Then describe the way the sub-program will seek to address each barrier, area of concern or gap[33] (suggested work limit: 600 words per subprogram).

The new financing program offerings to be designed and developed in 2012 by the expert financing consultant; piloted in 2013; and scaled up in 2014 include:

[32] Individual utility specific information to be provided in this table

[33] Through marketing, delivery mechanisms, information, incentives, etc. If barriers vary by market sub-sector, provide this information. As part of this, succinctly describe the role of any market actors upstream from the customer such as installers, venders, architects, etc.; indicate if and why the program approach constitutes "best practice," is "innovative" or reflects "lessons learned" in market strategies, program design and/or implementation techniques.

1. A credit enhancement strategy for the single-family residential market. Utilities will look into selecting a single entity that can be utilized by both local and statewide lenders to administer credit enhancements. A single entity can offer consistency across the State and gain economies of scale of its operations. Entities such as CAEATFA or other organizations with similar capabilities and experiences will be considered for this role. Unlike for multifamily and non residential customer segments, an On-Bill Repayment (OBR) strategy will not be developed for all residential customers at this point per Commission's guidance.

2. A financing program strategy designed specifically for the multifamily residential market that includes both credit enhancement and an on-bill repayment option where the customer could pay back an energy efficiency project loan from a third party through their energy bill. This strategy may require legislative change to fully implement. The program' structure or terms may vary in order to attract customers and building owners from both a) low-moderate income and b) moderate-high income multifamily residential market segments. Per Commission's guidance, the utilities along with the expert finance consultant will explore the following program design features:

    - Start with a bill neutrality objective, at least for credit challenged or lower-income populations.
    - Consider an additional cushion beyond bill neutrality to minimize potential negative impact on consumers.
    - Seek to structure loans and eligible measures to give the owner at least an 11% return.
    - Start with placing the loan obligations on common meters.
    - Identify specific waivers and/or clearance required from the California Department of Corporations for lending to this market segment.
    - Consider possible tariffed service utilizing private capital.
    - Seek to marry the energy efficiency loan opportunity with solving another problem (such as equipment malfunction, safety, health).
    - Seek to pair the energy efficiency measure with a home equity loan.
    - For multifamily market-rate rental housing, credit enhancement may be necessary to drive participation.
    - Offer (and test) with a variety of multifamily types, including high rises and low rises, condos and rentals, and different physical configurations (central vs. individual building systems).

3. A credit enhancement strategy for the small business market. Similar to the single family residential market, credit enhancement for small business market segment may be provided or aggregated by a third-party such as CAEATFA or a similar type of entity.

4. An on-bill repayment strategy for all non-residential customers. Bill neutrality will not be required, however, an estimate of the bill impacts of the energy efficiency project to be financed will be presented to the customer at the time they are making the commitment to the project, thus ensures an informed decision by the customer without a strict

requirement for bill neutrality. Partial payments will be allocated between utility bill obligations and loan repayment on a pro rata basis.

In addition, utilities, the expert financing consultant, and a working group convened by the consultant, will develop or contribute to a larger-scale database or databases of financing related data and information that can be shared publicly after appropriately masking individual customer confidential information.

b) **Sub-Program Energy and Demand Objectives**- If this sub-program has energy and demand objective, please complete Table 2.

**Table 6. Projected Sub-Program Net Energy and Demand Impacts, by Calendar Year (Rough Estimate, If Possible)** [34]

| | Program Years | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 2013 | | | | 2014 | | | | Total |
| **New Financing Offerings** | SDG&E | SCE | SCG | PG&E | SDG&E | SCE | SCG | PG&E | |
| GWh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Peak MW | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Therms (millions) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

It is not feasible to develop energy savings for these programs as IOUs have no experience with these program elements. Additionally, it is assumed that a number of the measures to be installed may not be eligible for a rebate/incentive and therefore will need to be treated as "custom measures".

c) **Program Non-Energy Objectives**:

*[Please refer to Attachment A of this template for instructions on how to provide Non-Energy Objectives]*

d) **Cost Effectiveness/Market Need**: What methods will be or have been used to determine whether this program is cost-effective?[35] If this is a non-resource program, describe the literature, market assessments or other sources that indicate a need for this program.

The methods contained in the Standard Practice Manual will be used

e) **Measure Savings/ Work Papers (Rough Estimate, If Possible)** :

[34] Individual utility specific information to be provided in this table

[35] If the program has energy and demand objectives, simply state that the methods contained in the Standard Practice Manual will be used. If the program does not have energy and demand objective, propose an approach to assess cost-effectiveness.

a. Indicate data source for savings estimates for program measures (DEER, custom measures, etc).

b. Indicate work paper status for program measures:

**Table 4 – Work paper Status**

*[Table 4 Work paper Status to be provided as an Excel Attachment to this PIP. Please see file "AppendixC_2013-2014_PIPTemplate_NEWPrograms_V05Attachment.xlsx" for table formats]*

**10) Program Implementation Details**

a) **Timelines:** List the key program milestones and dates. An example is included below.

**Table 5:**. Sub-Program Milestones and Timeline (example)

b) **Geographic Scope**: List the geographic regions (e.g., CEC weather zones) where the program will operate

**Table 6: Geographic Regions Where the Program Will Operate –**

**c) Program Administration**

**Table 7: Program Administration of Program Components (Rough Estimate, If Possible)**

*[Table 7 Program Administration to be provided as an Excel Attachment to this PIP. Please see file "AppendixC_2013-2014_PIPTemplate_NEWPrograms_V05Attachment.xlsx" for table formats]* **(TBD)**

**d) Program Eligibility Requirements (TBD) :**

**i. Customers:** List any customer eligibility requirements (e.g., annual energy use, peak kW demand) **(TBD)**:

**Table 8: Customer Eligibility Requirements (Joint Utility Table) (TBD)**

*[Table 8 Customer Eligibility Requirements to be provided as an Excel Attachment to this PIP. Please see file "AppendixC_2013-2014_PIPTemplate_NEWPrograms_V05Attachment.xlsx" for table formats]* **(TBD)**

**ii. Contractors/Participants:** List any contractor (and/or developer, manufacturer, retailer or other "participant") eligibility requirements (e.g. specific

IOU required trainings; specific contractor accreditations; and/or, specific technician certifications required). **(TBD)**

**Table 9: Contractor/Participant Eligibility Requirements (Joint Utility Table) (TBD)**
*[Table 9 Customer Eligibility Requirements to be provided as an Excel Attachment to this PIP. Please see file "AppendixC_2013-2014_PIPTemplate_NEWPrograms_V05Attachment.xlsx" for table formats]* **(TBD)**

e) **Program Partners (TBD):**

a. **Manufacturer/Retailer/Distributor partners:** For upstream or midstream incentive and/or buy down programs indicate[36]: **(TBD)**

**Table 10: Manufacturer/Retailer/Distributor Partners (N/A)**

*[Table 10 Manufacturer/Retailer/Distributor/Partners to be provided as an Excel Attachment to this PIP. Please see file "AppendixC_2013-2014_PIPTemplate_NEWPrograms_V05Attachment.xlsx" for table formats]* **(N/A)**

b. **Other key program partners**: Indicate any research or other key program partners:

f) **Measures and incentive levels**: E3 calculators will provide the list of measures and incentive levels to be provided via the program. In this section the utilities should provide a summary table of measures and incentive levels. **(Rough Estimate, If Possible)**

**Table 11: Summary Table of Measures, Incentive Levels and Verification Rates (Rough Estimate, If Possible)**

*[Table 11 Summary Table of Measures, Incentive Levels and Verification Rates to be provided as an Excel Attachment to this PIP. Please see file "AppendixC_2013-2014_PIPTemplate_NEWPrograms_V05Attachment.xlsx" for table formats]*
**(Rough Estimate, If Possible)**

a. Use a single excel spreadsheet to indicate the eligible measures for the program across all IOUs. Indicate the expected incentive level by measure or measure grouping for each IOU, making clear where these vary. **(Rough Estimate, If Possible)**

[36] Provide in a consistent format for all IOUs. Indicate program partners across all IOU territories in one table or spreadsheet. Append to end of PIP.

b. For each incented or rebated measure, indicate the market actor to whom this will be provided. **(Rough Estimate, If Possible)**

g) **Additional Services:** List additional services that the sub-program will provide, to which market actors.

a. For each service provided, indicate any expected charges to market actors of the services, and/or the level at which any such services will be incented or funded.

**Table 12: Additional Services**

*[Table 12 Additional Services to be provided as an Excel Attachment to this PIP. Please see file "AppendixC_2013-2014_PIPTemplate_NEWPrograms_V05Attachment.xlsx" for table formats]*

h) **Sub-Program Specific Marketing and Outreach:** Please describe, providing timelines (suggested word limit: 300 words)

i) **Sub-Program Specific Training:** Please describe, providing timelines (suggested word limit: 300 words)

j) **Sub-Program Software and/or Additional Tools:**

a. List all eligible software or similar tools required for sub-program participation. **(Rough Estimate, If Possible)**
b. Indicate if pre and/or post implementation audits will be required for the sub-program. ___ Yes ___ No **(TBD)**
   Pre-implementation audit required ___ Yes ___ No
   Post-implementation audit required ___ Yes ___ No
c. As applicable, indicate levels at which such audits shall be rebated or funded, and to whom such rebates/funding will be provided (i.e. to customer or contractor). **(Rough Estimate, If Possible)**

**Table 13: Post-implementation Audits (Rough Estimate, If Possible)**

*[Table 13 Program Related Audits to be provided as an Excel Attachment to this PIP. Please see file "AppendixC_2013-2014_PIPTemplate_NEWPrograms_V05Attachment.xlsx" for table formats]*
**(Rough Estimate, If Possible)**

**k)** **Sub-Program Quality Assurance Provisions:** Please list quality assurance, quality control, including accreditations/certification or other credentials **(TBD)**

**Table 14: Quality Assurance Provisions (TBD)**

*[Table 14 Quality Assurance Provisions to be provided as an Excel Attachment to this PIP. Please see file "AppendixC_2013-2014_PIPTemplate_NEWPrograms_V05Attachment.xlsx" for table formats]* **(TBD)**

l) **Sub-program Delivery Method and Measure Installation /Marketing or Training:** Briefly describe any additional sub-program delivery and measure installation and/or marketing & outreach, training and/or other services provided, if not yet described above.

**m) Sub-program Process Flow Chart:** Provide a sub-program process flow chart that describes the administrative and procedural components of the sub-program. For example, the flow chart might describe a customer's submittal of an application, the screening of the application, the approval/disapproval of an application, verification of purchase or installation, the processing and payment of incentives, and any quality control activities. **(TBD)**

**n) Cross-cutting Sub-program and Non-IOU Partner Coordination:** Indicate other IOU EE, DR or DG sub-programs with which this sub-program will regularly coordinate. Indicate also key non-IOU coordination partners. Indicate expected coordination mechanisms[37] and frequency[38]: **(Rough Estimate, If Possible)**

**Table 15: Cross-cutting Sub-program and Non-IOU Partner Coordination (TBD)**

*[Table 15 Cross-cutting Sub-program and Non-IOU Partner Coordination to be provided as an Excel Attachment to this PIP. Please see file "AppendixC_2013-2014_PIPTemplate_NEWPrograms_V05Attachment.xlsx" for table formats]*

o) **Logic Model:** Please append the logic model for this sub-program to the end of this PIP. Describe here any additional underlying theory supporting the sub-program intervention approach, referring as needed to the relevant literature (e.g., past evaluations, best practices documents, journal articles, books, etc.). **(TBD)**

**11) Additional Sub-Program Information**

[37] "Mechanisms" refers to communication methods (i.e. quarterly meetings; internal list serves; monthly calls, etc.) and/or any cross-program review methods (i.e., feedback on program plans; sign off on policies, etc). or harmonization techniques (i.e. consistent certification requirements across programs, program participant required cross trainings, etc).
[38] This does not mean there would be mutual understanding of the on the mechanism or a known frequency of coordination; rather, just provide enough information to give a general sense of the coordinate efforts.

a) **Advancing Strategic Plan Goals and Objectives**: Describe how sub-program advances the goals, strategies and objectives of the California Long Term Energy Efficiency Strategic Plan (word limit: 150 words)

**b) Integration (TBD)**

i. **Integrated/coordinated Demand Side Management**: As applicable, describe how sub-program will promote customer education and sub-program participation across all DSM options. Provide budget information of non-EE sub-programs where applicable. **(TBD)**

**Table 16: Non-EE Sub-Program Information (TBD)**

*[Table 16 Non-EE Sub-Program Information to be provided as an Excel Attachment to this PIP. Please see file "AppendixC_2013-2014_PIPTemplate_NEWPrograms_V05Attachment.xlsx" for table formats]*

ii. **Integration across resource types** (energy, water, air quality, etc): If sub-program aims to integrate across resources types, please provide rationale and general approach. **(TBD)**

*[This information can be found in Table 16 Non-EE Sub-Program Information to be provided as an Excel Attachment to this PIP. Please see file "AppendixC_2013-2014_PIPTemplate_NEWPrograms_V05Attachment.xlsx" for table formats]* **(TBD)**

c) **Leveraging of Resources**: Please describe if the subprogram will leverage additional investments by market actors or other state, local or federal agencies. **(TBD)**

d) **Trials/ Pilots:** Please describe any trials or pilot projects planned for this sub-program **(TBD)**

e) **Knowledge Transfer:** Describe the strategy that will be used to identify and disseminate best practices and lessons learned from this sub-program **(TBD)**

12) **Market Transformation Information**: For programs identified as market transformation programs, include the following (suggested page limit- five pages): **(TBD)**

i. A summary of the market transformation objectives of the program. **(TBD)**
ii. A description of the market, including identification of the relevant market actors and the relationships among them; **(TBD)**
iii. A market characterization and assessment of the relationships/dynamics among market actors, including identification of the key barriers and opportunities to advance demand side management technologies and strategies; **(TBD)**

iv. A description of the proposed intervention(s) and its/their intended results, and specify which barriers the intervention is intended to address; **(TBD)**

v. A coherent program, or "market," logic model that ensures a solid causal relationship between the proposed intervention(s) and its/their intended results[39]; **(TBD)**

vi. Appropriate evaluation plans and corresponding Market Transformation indicators and Program Performance Metrics based on the program logic model. **(TBD)**

13) **Additional information as required by Commission decision or ruling or as needed:** Include here additional information as required by Commission decision or ruling (As applicable. Indicate decision or ruling and page numbers):

Decision 12-05-015

- The utilities are requested to propose for the credit enhancement product in their 2013-2014 portfolio applications with discussion of the preferred options and rationale". (p.119)

  The loan loss reserve is the preferred credit enhancement option proposed by the utilities. With the loan loss reserve, funds are required only to cover actual loan defaults and therefore a more effective use of ratepayer funding (as opposed to interest rate buy-downs which require funding to offset every loan). However, if there is no interest in the product, the utilities will explore other alternatives.

- The question of multiple program participation should be addressed in the utility 2013-2014 applications (p.130)

  A single project cannot receive funds from more than one loan program supported by ratepayer dollars. A clear and understandable menu of financing choices available to utility customers through the Statewide Finance Program should be developed to help interested customers select the option best suited for their projects. The utilities will train the contractors/account executives on these financing options in order to assist customers seeking financing for their investment in demand-side technologies (energy efficiency, demand response, distributed generation, and storage).

- In their 2013-2014 program portfolio applications, the utilities should also provide details on the billing system upgrades and/or other information technology costs that may be associated with an on-bill repayment offering for the non-residential market (P. 133)

  A preliminary cost estimate for upgrading OBF billing systems to support Non Residential OBR is estimated at $750,000. As the design for the new finance programs are completed, there may be refinement to this cost estimate.

[39] If this logic model is the same as that requested in #10.(O), only provide once. As needed, provide a more detailed logic model emphasizing the market transformation elements of the program and/or how such elements integrate with resource acquisition elements.

- Utilities should propose a fee mechanism to negotiate with participating lenders or other financial entities that allows utilities to cover the costs of any ongoing billing expenses and infrastructure upgrades to provide the on-bill repayment service. (p.133)

  The utilities propose an OBR fee mechanism similar to that for the utility's Line Item Billing Program. The preliminary fee structure will likely include:

  - Fixed monthly billing fee per customer for providing the billing and remittance processing services, and associated reports and customer service.
  - Upfront payment to cover start up costs (system changes, project management) to support lender processes.
  - Reimbursement for costs associated with incremental Customer Service Support.

- The utilities should include in their applications a discussion of the relationship of the on-bill repayment offering with existing utility programs and their associated rebates or other financial incentives (p.133)

  The utilities propose that on-bill repayment to be offered as an alternative to utility rebates/incentives to maximize portfolio cost effectiveness. Per Commission guidance, bill neutrality will not be required for non residential OBR projects and therefore it will not be as difficult for gas-only projects to qualify for OBR loans. Additionally, not all measures in an OBR project have to be part of another utility rebate/incentive program, how much of a total project must be eligible for other incentive programs will be determined during the program design stage in 2012.

- Utilities should propose in their 2013-2014 program applications an approach for counting incremental energy savings achieved by financing program offerings while avoiding double counting with savings from other programs (p.136)

  With on-bill repayment expected to be offered as an alternative to rebates/incentives, and that financing programs are defined as "resource," incremental energy savings associated with OBR projects will be counted toward OBR programs and not rebate/incentive programs.

## ATTACHMENT 1

### Program Non-Energy Objectives

For New or Substantially changed programs and sub-programs, provide the following information for Program Non-Energy Objectives and follow the format used for the previous cycle Program Performance Metrics found in Resolution E-4385.

i. List the primary SMART[40] non-energy objectives of the program. These should correspond to key methods identified above to overcome the market barriers, areas of concern or gaps, and to the outputs and short, mid- and long-term non-energy outcomes identified in the logic model requested below. **(Rough Estimate, If Possible)**

ii. For each SMART objective, identify the quantitative targets, direction or percent of change that you hope to achieve during the program cycle.[41] **(Rough Estimate, If Possible)**

iii. For each proposed SMART objective, describe any relevant baseline data on current market conditions that you have assembled or plan to assemble and the sources. **(Rough Estimate, If Possible)**

iv. **Quantitative program targets (PPMs) (Rough Estimate, If Possible):** If not already provided above, indicate estimates of the number of measure units, buildings, etc. projected to be treated by the sub-program.

**Table 3. Quantitative Program Targets (PPMs)**

*[Table 3 Quantitative Program Targets (PPMs) to be provided as an Excel Attachment to this PIP. Please see file "AppendixC_2013-2014_PIPTemplate_NEWPrograms_V05Attachment.xlsx" for table formats]*

[40] A SMART objective is one that is **S**pecific (i.e. quantitative and quantifiable generally, in terms of the results to be achieved**), M**easurable, **A**mbitious, **R**ealistic, and **T**ime-bound. For example, for a vender training component of an innovative commercial program, two SMART mid-term objectives and one long-term objective might be:

g) During the period 2013-2014, the number of HVAC installers in the SCE service territory who are able to perform quality installations of energy efficient packaged air conditioners will increase by 20%.
h) During the period 2013-2014, the number of installations of energy efficient packaged air conditions in the SCE service territory that are considered quality installations will increase by 25%.
i) By 2020, installations of energy efficient packaged air conditions in the SCE service territory that are considered quality installations will increase by 75%.

[41] Please also add any new program objectives and quantitative targets for statewide programs to the portfolio PPM/MTI reporting template.

1) **Program Name**: Lighting Program
**Program ID#:**
**SDG&E Program Type:** Core

2) **Program Description:**
The 2013-2014 Statewide Lighting Program encompasses all previously existing residential lighting programs, as well as non-residential lighting measures and the Lighting Market Transformation program.

The 2013-2014 Statewide Lighting Program is designed to promote energy efficient lighting across market sectors. The 2011 Potential Study determined that the market potential for basic Compact Fluorescent Lamps ("CFLs"), advanced lighting measures (including fixtures, ballasts, controls, Light Emitting Diodes ["LEDs"], and specialty CFLs) and dimmable linear fluorescent ballast products is substantial. As such, the 2013-2014 Statewide Lighting Program will focus on refining present strategies and tactics that integrate, leverage and build upon existing delivery channels and customer relationships, while developing and testing market transformation strategies for commercially viable, advanced lighting technologies.

The 2013-2014 Statewide Lighting Program will facilitate market transformation for advanced lighting products through a number of activities including: 1) assessment of pre-commercialized lighting technologies, 2) demonstration projects for advanced lighting technologies in the early stages of commercialization, and 3) incentives for cost-effective lighting measures that have reached a greater level of commercialization. Additionally, the 2013-2014 Statewide Lighting Program will include trial studies to identify promising program design and delivery approaches. The Program will also oversee the progression of lighting measures from emerging technologies to mass market adoption.

The CPUC's Long Term Energy Efficiency Strategic Plan ("Strategic Plan") directed the IOUs to phase out support for basic bare spiral CFLs. As such, the 2013-2014 Statewide Lighting Program continues to transition away from basic lighting measures and towards new technologies that promote lasting energy savings.

The IOUs have identified possible existing market barriers to implementing the 2013-2014 Statewide Lighting Program. These barriers include insufficient customer knowledge, poor product quality, high product cost, and low market availability. The IOUs, in addition to other key parties, will address these barriers through incentives, program trials, and market education and outreach.

3) **Total Projected Program Budget and Savings:**
The IOU's funding request and total projected savings for the proposed 2013-2014 Statewide Lighting Program is detailed in Table 1 & 2 below, respectively.

The IOUs believe the funding amount is reasonable, results in a cost-effective portfolio that meets the Commission's energy savings targets for 2013-2014, and supports the Strategic Plan.

## 4) Total Projected Program Budget

Table 1

| Program Code | Program Name | Administrative Amount | Marketing Amount | Direct Install Amount | Incentive Amount | Total Budget Amount |
|---|---|---|---|---|---|---|
| | **SW Lighting Program** | | | | | |
| 3240 | SW-Lighting-Lighting Market Transformation | $207,383 | $28,412 | $419,685 | $0 | $655,480 |
| 3241 | SW-Lighting-Lighting Innovation-ETPC MD | $371,178 | $57,461 | $3,092,011 | $0 | $3,520,650 |
| 3245 | SW-Lighting-Primary Lighting | $364,308 | $501,069 | $2,987,999 | $4,144,288 | $7,997,663 |
| | TOTAL: | $942,868 | $586,943 | $6,499,695 | $4,144,288 | $12,173,794 |

## 5) Total Projected Program Savings by IOU

Table 2

| Program Code | Program Name | Gross kW Savings | Gross kWh Savings | Gross Therm Savings |
|---|---|---|---|---|
| | **SW Lighting Program** | | | |
| 3240 | SW-Lighting-Lighting Market Transformation | 0 | 0 | 0 |
| 3241 | SW-Lighting-Lighting Innovation-ETPC MD | 0 | 0 | 0 |
| 3245 | SW-Lighting-Primary Lighting | 7,103 | 67,727,016 | (919,528) |
| | TOTAL: | 7,103 | 67,727,016 | (919,528) |

## 6) Short description of each subprogram:

The 2013-2014 Statewide Lighting Program includes the following subprograms.

- Lighting Market Transformation. The Lighting Market Transformation (LMT) subprogram establishes the process through which the IOUs will develop and test market transformation strategies for emerging lighting technologies and for those technologies already incorporated into existing energy efficiency programs. The LMT subprogram will oversee the progression of new lighting measures to the Primary Lighting and Lighting Innovation subprograms. Additionally, the LMT subprogram will utilize pre-commercialized and commercialized scoping metrics to assign projects to Emerging Technology or Lighting Innovation. Finally, the LMT subprogram will support Codes and Standards Program activities as lighting technologies are phased out.

- Lighting Innovation. The Lighting Innovation subprogram will identify lighting measures that can potentially progress into the Primary Lighting subprogram. The subprogram will support advanced lighting technologies aimed at early adopters through carrying out demonstration or pilot projects and in-field trial studies of measures in the early stages of commercialization. The Lighting Innovation subprogram will seek out lighting measures that should eventually be supported on a larger scale, and identify promising program design approaches.

- Primary Lighting. The Primary Lighting subprogram will employ upstream, midstream, and downstream incentive offerings for energy efficient lighting

measures. This subprogram will support lighting measures with a greater level of commercialization and will facilitate rapid market adoption through cost-effective rebates. The Primary Lighting subprogram includes CFLs, LEDs, and dimmable linear fluorescent ballasts among other new technologies.

1) **Sub-Program Name:** Lighting Market Transformation
   **Sub-Program ID number:**
   **Type of Sub-Program: _ ✓ _Core __Third Party __Partnership**

2) **Market sector or segment that this sub-program is designed to serve:**
   a. _✓_ Residential
      i. Including Low Income? _ ✓ _ Yes __ No
      ii. Including Moderate Income? _ ✓ _ Yes __ No
      iii. Including or specifically Multifamily buildings __ Yes __ No
      iv. Including or specifically Rental units? _✓_ Yes __ No
   b. _✓_ Commercial (List applicable NAIC codes: _____)
   c. _✓_ Industrial (List applicable NAIC codes: _____)
   d. _✓_ Agricultural (List applicable NAIC codes: _____)

3) **Is this sub-program primarily a:**
   a. Non-resource program _✓__ Yes__ No
   b. Resource acquisition program ___ Yes _✓_ No
   c. Market Transformation Program _✓__ Yes ___ No

4) **Indicate the primary intervention strategies:**
   a. Upstream ___ Yes _✓_ No
   b. Midstream ___ Yes _✓_ No
   c. Downstream ___ Yes _✓_ No
   d. Direct Install __ Yes _✓_ No
   e. Non Resource _✓_ Yes __ No

5) **Projected Sub-program Total Resource Cost (TRC) and Program Administrator Cost (PAC):** TRC ___ PAC ___

6) **Projected Sub-Program Budget, by Calendar Year**

Table 1

| Program Code | Program Name | Administrative Amount | Marketing Amount | Direct Install Amount | Incentive Amount | Total Budget Amount |
|---|---|---|---|---|---|---|
| | **SW Lighting Program** | | | | | |
| 3240 | SW-Lighting-Lighting Market Transformation | $207,383 | $28,412 | $419,685 | $0 | $655,480 |
| 3241 | SW-Lighting-Lighting Innovation-ETPC MD | $371,178 | $57,461 | $3,092,011 | $0 | $3,520,650 |
| 3245 | SW-Lighting-Primary Lighting | $364,308 | $501,069 | $2,987,999 | $4,144,288 | $7,997,663 |
| | TOTAL: | $942,868 | $586,943 | $6,499,695 | $4,144,288 | $12,173,794 |

7) **Sub-Program Description, Objectives and Theory:**
   **a) Sub-Program Description and Theory:**

The Statewide Lighting Market Transformation Program (LMT) establishes a process by which the IOUs can rapidly introduce advanced lighting solutions (products, technologies, systems and design strategies) to the marketplace, continually improve the IOUs' lighting programs across all market sectors, and develop innovative new program strategies to continually advance the lighting market. This is accomplished by overseeing lighting solutions across utility programs, including Emerging Technologies, Lighting Innovation, Primary Lighting and Codes and Standards.

LMT is designed to overcome the following market barriers and to support the CLTEESP.

1. Lack of clear strategy for efficiently phasing technologies into and out of customer energy efficiency programs
2. Insufficient market data and market transformation metrics for many technologies
3. Insufficient availability of affordable, high-quality models for some lighting technologies
4. Lack of information/education among end-users, utility staff, and equipment installation contractors

The subprogram identifies gaps in data, activities and strategies for different lighting solutions. Through market research and coordination efforts, LMT provides data-driven guidance to lighting activities within the Emerging Technologies Program, demonstrations and program design trials within the Lighting Innovation Program, incentive delivery strategies within the Primary Lighting Program, and lighting aspects of other utility programs.

The program also includes an education and information component to improve availability of market data and program design resources for efficiency programs, government and other market actors; as well as lighting solution information for consumers, including contractors, designers, retailers and other end-users through programs such as the Marketing Education & Outreach and Workforce Education & Training programs.

This program includes the following key activities:

1. Lighting Market Transformation
    a. Maintain updated lighting market, technology, and activity information in Lighting Solution Workbook and Lighting Activity Workbook with input from stakeholders and market actors. Up-to-date information allows IOUs to adapt activity plans and adjust strategies to respond to dynamic market trends. The Workbooks contain market and consumer wants and needs through stakeholder input and market studies.
    b. Prioritize lighting program intervention strategies (i.e., acceleration and/or sunset lighting measures) in the context of customer wants

and needs by using the Lighting Solutions and Activity Workbooks.

c. Track and coordinate lighting program activities beyond California to minimize duplication of efforts and leverage resources using the Lighting Activity Workbook.

d. Develop Lighting Solution Pipeline Plans to articulate market wants, needs, and major barriers associated with key lighting solutions and present near- and long-term data and activity needs required to overcome identified key market barriers.

e. Define goals and objectives for high priority intervention strategies in Lighting Solution Pipeline Plans, targeting specific measures and customer sectors. The Pipeline Plans provide the blue-prints to focus implementation activities within IOU programs, such as ETP, Lighting Innovation, and Primary Lighting sub-programs. The Pipeline Plans are data-driven, leveraging information from sources such as Lighting Solution and Activity Workbooks, and input and guidance from key LMT utility, government and industry partners on customer wants and needs.

f. Formulate processes to transition lighting solutions among ETP, Codes and Standards, and Statewide Lighting sub-programs by utilizing tools such as the LMT Pipeline Plans and Workbooks.

2. Lighting Education and Information for Key Audiences and Stakeholders

a. Improve access of quality lighting information to consumers and end-users by providing lighting information support for Marketing Education & Outreach and Workforce Education & Training and leveraging customer wants and needs information in LMT Pipeline Plans, Workbooks and other sources.

b. Improve access of lighting program-related resources, such as Lighting Solution and Activity Workbooks, Pipeline Plans, and other program-related studies and reports, to utility programs, government organizations, academia, industry partners, and other market actors. The activities may include developing white papers, providing webinars, and participating at industry conferences, seminars, trade-shows and other events.

**b) Sub-Program Energy and Demand Objectives**

**Table 2. Projected Sub-Program Net Energy and Demand Impacts, by Calendar Year**

| | Program Years | | |
|---|---|---|---|
| | **2013** | **2014** | **Total** |
| **Sub-program Name** | | | |
| GWh | | | |
| Peak MW | | | |

| | | | |
|---|---|---|---|
| Therms (millions) | | | |

**c) Program Non-Energy Objectives**:

**d) Cost Effectiveness/Market Need**:

The Lighting Market Transformation Program has the overarching goal to support the strategic direction outlined in the Lighting Chapter of the California Long Term Energy Efficiency Strategy Plan (CLTEESP) (source: CLTEESP, page 94)

1. Develop and implement coordinated policies, procedures, and other market interventions that eliminate barriers, accelerate lighting market transformation in California and provide incentives for best practice lighting technologies and systems.
2. Define and advance best practices for design, installation, operation and maintenance of integrated systems to achieve sustainable lighting solutions for all spaces.
3. Create widespread end user demand to purchase and use best practice lighting technologies and systems.
4. Develop research, development, and demonstration (RD&D) networks to create, test, and deliver the lighting solutions needed to transform California's lighting market achieve ZNE goals.

**e) Measure Savings/ Work Papers**:

a. Indicate data source for savings estimates for program measures (DEER, custom measures, etc).

b. Indicate work paper status for program measures:

Work papers will not be a part of this program. The Lighting Market Transformation Subprogram will help transition measures from the emerging technology stage to work paper development and eventual entry in the Primary Lighting Subprogram.

**Table 4: Work paper Status**

See Attachment 3

**8) Program Implementation Details**

**a) Timelines:**

The Statewide LMT Program is required to provide a program annual report pursuant to Decision 09-09-047, Ordering Paragraph 22 at page 375 and guidance from the Energy Division (ED).

On May 18, 2012, the Commission issued Decision 1205015 Decision Providing Guidance on 2013-2014 Energy Efficiency Portfolios and 2012 Marketing, Education and Outreach, which directed the utilities to fully transition all relevant materials to the Energy Upgrade California web portal, with the Engage 360 web

portal decommissioned, by no later than the end of 2013 (D.1205015, OP 127). The IOUs will follow the Decision's directive to develop an updated communication plan that will transition all of the LMT program information onto the Energy Upgrade California web portal before the end of 2013.

**Table 5: Sub-Program Milestones and Timeline**

See Attachment 3

**b) Geographic Scope**

**Table 6: Geographic Regions Where the Program Will Operate**

See Attachment 3

**c) Program Administration**

**Table 7: Program Administration of Program Components**

See Attachment 3

**d) Program Eligibility Requirements:**

**i. Customers:**

**Table 8: Customer Eligibility Requirements**

See Attachment 3

**ii. Contractors/Participants**

**Table 9: Contractor/Participant Eligibility Requirements**

See Attachment 3

**e) Program Partners:**

**a. Manufacturer/Retailer/Distributor partners:**

**Table 10: Manufacturer/Retailer/Distributor Partners**

See Attachment 3

**b. Other key program partners**:

By its nature, market transformation must occur through many market actors and cannot occur due to a single entity itself. Therefore, LMT must build, maintain, coordinate and leverage partner organizations with common goals. These partners comprise of federal, state, and local

government organizations, energy and lighting industry organizations, academia, other utilities, manufacturers, sales channels, advocacy groups and end-user groups. This includes Department of Energy, Environmental Protection Agency, California Energy Commission, California Lighting Technology Center, Lawrence Berkeley and Pacific Northwest National Labs, Consortium for Energy Efficiency, Natural Resources Defense Council, Illuminating Engineering Society of North America, International Lighting Designers, lighting manufacturers, retailers, and end-user groups.

**f) Measures and incentive levels**:

**Table 11: Summary Table of Measures, Incentive Levels and Verification Rates**

See Attachment 3

a. Indicate the expected incentive level by measure or measure grouping.
b. For each incented or rebated measure, indicate the market actor to whom this will be provided.

g) **Additional Services:**

a. For each service provided, indicate any expected charges to market actors of the services, and/or the level at which any such services will be incented or funded.

**Table 12: Additional Services**

See Attachment 3

**h) Sub-Program Specific Marketing and Outreach:**

IOUs will conduct integrated as well as program-specific marketing and outreach to support the goals and objectives of respective lighting subprograms. Refer to appropriate resource subprograms for specific marketing and outreach activities.

**i) Sub-Program Specific Training:**

**j) Sub-Program Software and/or Additional Tools:**

a. List all eligible software or similar tools required for sub-program participation.

**Lighting Solution Workbook**

The LMT Lighting Solution Workbook is a utility program planning tool. The workbook contains market data that assists in the prioritization of

identified lighting solutions (such as products, systems, and design strategies) by market, technology, savings potential, and market barrier. The prioritization variables depend on the specific aspect in consideration for program planning. The goal of the Lighting Solution Workbook is to guide the selection of Key Lighting Solutions to help achieve the optimal balance of cost and benefit in order to overcome the associated market barriers.

Lighting solution prioritization is required to properly give precedence to key lighting solutions with the most potential benefit from utility program intervention strategy development or pipeline plans. The lighting solution prioritization considers utility program, state, and market needs as well as energy and demand savings potential and market barriers. The Lighting Solution Workbook and Lighting Activity Workbook data will be used to support the overall prioritization efforts. LMT also supports lighting activity prioritization at the individual utility program level. For example, data in the Lighting Solution Workbook and Lighting Activity Workbook can be referenced by the Codes and Standards program to determine which technologies are considered mature with relatively high savings potential. Another example is to filter solutions with education and information as the primary barrier and sort by savings potential to help prioritize which solutions should be targeted for Workforce Education and Training efforts.

**Lighting Activity Workbook**

The LMT Lighting Activity Workbook contains information about the various completed, on-going, and planned lighting activities (such as technology assessments, demonstrations, program trial studies, and M&E market studies). The Lighting Activity Workbook provides an overall view of lighting market transformation activities, allowing a high level assessment of potential activity gaps. This supports the efforts in prioritizing and aligning lighting activities to efficiently and effectively overcome market barriers for the Key Lighting Solutions. The Lighting Activity Workbook also helps to reduce duplication of efforts, allowing utilities the ability to leverage data from recently completed studies and plan future studies in a coordinated manner.

**Lighting Solution Pipeline Plans**

The LMT Lighting Solution Pipeline Plans are market-based strategy documents and coordination plans to accelerate market adoption of key lighting solutions as well as reduce assistance for lighting solutions that no longer need utility support. The pipeline plans articulate sector- and segment-specific market wants, needs, and key barriers associated with a lighting solution and present the data and activity needs required to overcome the identified key market barriers for the adoption or reduction of utility support for key lighting solutions. LMT carries out the pipeline

plan actions by providing targeted support, guidance and direction for lighting market transformation efforts.

The Pipeline Plans leverage market data from the Lighting Solution Workbook and activity information in the Lighting Activity Workbook to set forth a data-driven plan with LMT partner and stakeholder assistance to support lighting market transformation.

The outcome of the LMT activities yields valuable information for the lighting industry, market actors, and key stakeholders. The communication and sharing of this information will be carried out in the Lighting Education and Information Activity.

a. Indicate if pre and/or post implementation audits will be required for the sub-program.
   Pre-implementation audit required Yes X No
   Post-implementation audit required Yes X No
b. As applicable, indicate levels at which such audits shall be rebated or funded, and to whom such rebates/funding will be provided (i.e. to customer or contractor). N/A

**Table 13: Post-implementation Audits**

See Attachment 3

**k) Sub-Program Quality Assurance Provisions:**

**Table 14: Quality Assurance Provisions**

See Attachment 3

| QA Requirements | QA Sampling Rate (Indicate Pre/Post Sample) | QA Personnel Certification Requirements |
|---|---|---|
| Refer to Primary Lighting QA Provisions | | |

**l) Sub-program Delivery Method and Measure Installation /Marketing or Training:**

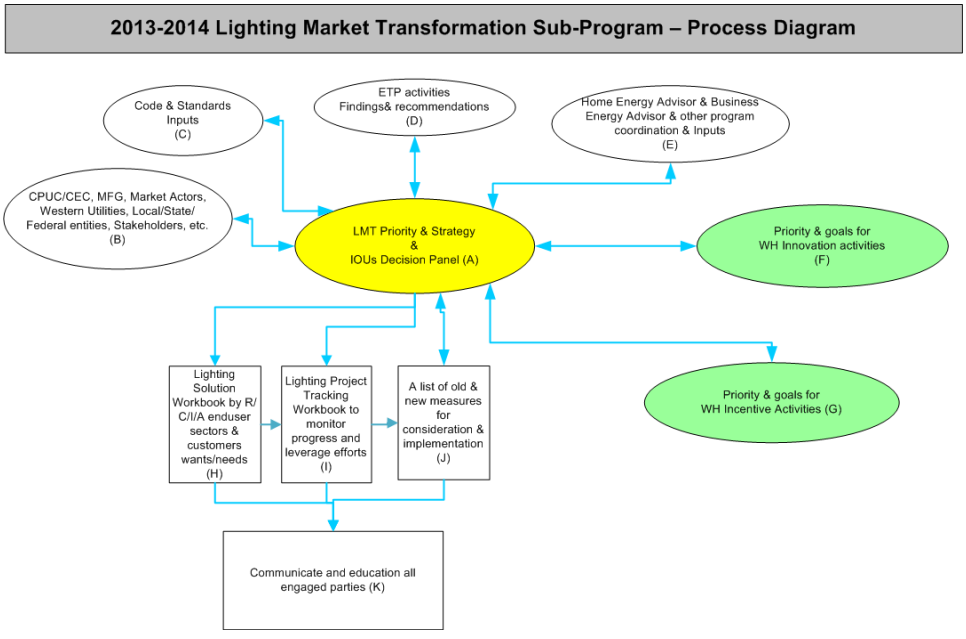
**Lighting Education and Information Activity**

The goal of this activity is to address the pressing need for better and more accessible information on lighting technologies. This initiative will provide improved access to information and education regarding existing and emerging lighting technologies among end-users, IOU staff, equipment suppliers, lighting designers, retailer staff, and equipment installation contractors.

As new technologies become available, consumers are faced with the challenges of identifying those technologies, discerning which technology or group of technologies are most appropriate for a given application, understanding the limitations of each technology, and – finally – locating the technologies they wish to purchase. As one possible strategy for overcoming these barriers, statewide funding has been allocated for the development of reliable lighting information resource, workshops, case studies, and best design practices. These efforts should target both new construction and retrofit markets to complement the existing IOU LMT efforts.

The LMT Program plans to provide lighting information support for Marketing Education and Outreach (ME&O) and Workforce Education and Training programs through coordination with Emerging Technologies, Codes and Standards and the Statewide Lighting Programs. The intent is to provide information to both general consumers and lighting stakeholders/professionals, each with different wants and needs. The LMT Program plans to have an online area dedicated to LMT Program stakeholders and partners. The LMT stakeholder area will house lighting program-related resources such as the Lighting Solution Workbook, Lighting Activity Workbook, Lighting Solution Pipeline Plans, and other lighting program-related studies and reports. The IOUs will follow the Final Decision's directive to develop an updated communication plan that will transition all of the LMT program information onto the Statewide ME&O web portal before the end of 2013.

**m) Sub-program Process Flow Chart:**




**n) Cross-cutting Sub-program and Non-IOU Partner Coordination:**

**Table 15: Cross-cutting Sub-program and Non-IOU Partner Coordination**

See Attachment 3

**o) Logic Model**:
See Attachment 2

The Lighting Market Transformation (LMT) sub-program is the controlling program for the other two sub-programs: Primary Lighting sub-program and Lighting Innovation sub-program. It is the LMT sub-program that sets the processes for introducing new products and removing matured ones from the Primary Lighting and Innovation sub-programs. The Primary lighting program is the production program. It works with the products that LMT feeds into it, minus the ones LMT removes due to the transformation of the market for products that were previously in the Primary Lighting sub-program. The Lighting Innovation sub-program is an intermediate program between LMT and Primary Lighting. It is the function of this sub-program to receive promising products from LMT and subject them to larger market trials as preparation for entry into the Primary Lighting sub-program.

Five activities in the LMT both feed into and take feedback from the IOU decision panel for the LMT sub-program. These include priority and goal setting, market, industry, and stakeholder studies and interactions, and market research, codes and standards, ETP, and priorities and goals from the Lighting Innovation sub-program. When these inputs are provided to the decision panel based on the readiness of new technologies to enter into the next phase of program activity and decisions are made to promote the product to another stage, the Innovation sub-program or the Primary Lighting subprogram take them on. This is reflected in the outputs and outcomes that show engagement with mid-stream and upstream market actors to produce agreements for subsidies and training. The Logic Model further shows that when these arrangements are made, customers, participants and non-participants, purchase the products. In these processes, market barriers at each level are overcome. In particular, lack of information barriers at each market level are addressed by the training and agreements and by stocking shelves with products that consumers are then exposed to. Once consumers have purchased and used the products, further barriers such as attitudinal barriers are overcome, leading to spillover effects.

**9) Additional Sub-Program Information**

**a) Advancing Strategic Plan Goals and Objectives**:
The LMT program addresses short and long term lighting opportunities across residential and non-residential market segments for both replacement and new construction to help get to the zero net energy goals in the CLTEESP. Please see Sections 9(a) and 9(d) for details on how the LMT sub-program advances the

goals and objectives outlined in the Lighting Chapter of the California Long Term Energy Efficiency Strategy Plan (CLTEESP) (source: CLTEESP, page 94).

**b) Integration**

**i. Integrated/coordinated Demand Side Management:**

The LMT and associated lighting programs are called upon to focus on lighting resources. However, the IOUs recognize the importance of comprehensive retrofit requirements for deep energy reductions and Demand Response solutions. To help achieve these goals, the IOUs look at lighting solutions as a part of an overall system; this includes Demand Response-capable lighting controls, for each customer sector and application, as appropriate.

**Table 16: Non-EE Sub-Program Information**

See Attachment 3

**ii. Integration across resource types.**

**c) Leveraging of Resources**:

LMT plans to leverage any resources available to increase program effectiveness.

For example, LMT is working with the Illuminating Engineering Society of North America (IESNA) and the International Association of Lighting Designers (IALD), among others, in an effort to increase education, training and certification for lighting specifiers and designers. The partnerships are intended to leverage the knowledge, education and training resources of those organizations to increase the effectiveness of IOU efforts.

**d) Trials/ Pilots:**

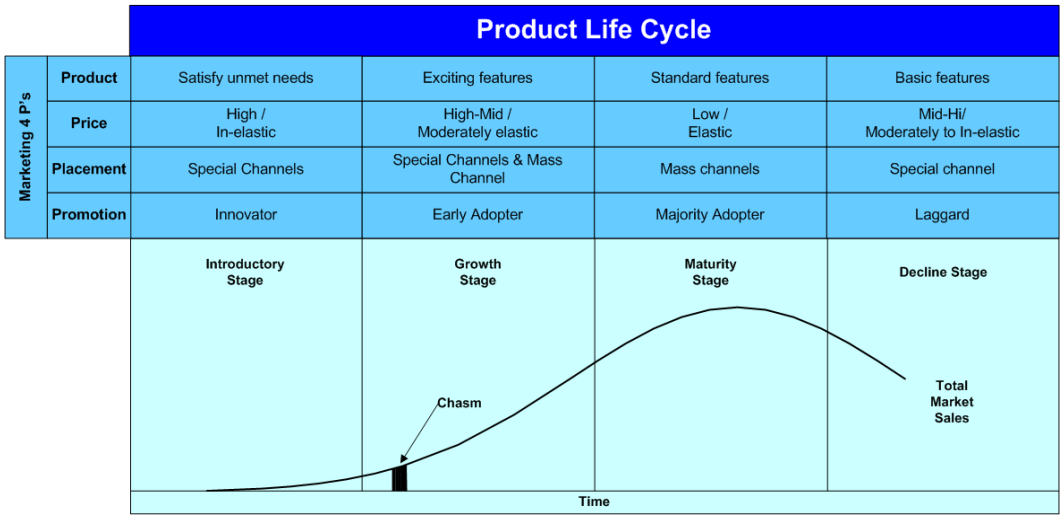
No current plans. The LMT program is instrumental in the design and development of pilots, trials and demonstrations. The LMT program will implement these efforts primarily through the Lighting Innovation Program.

**e) Knowledge Transfer:**

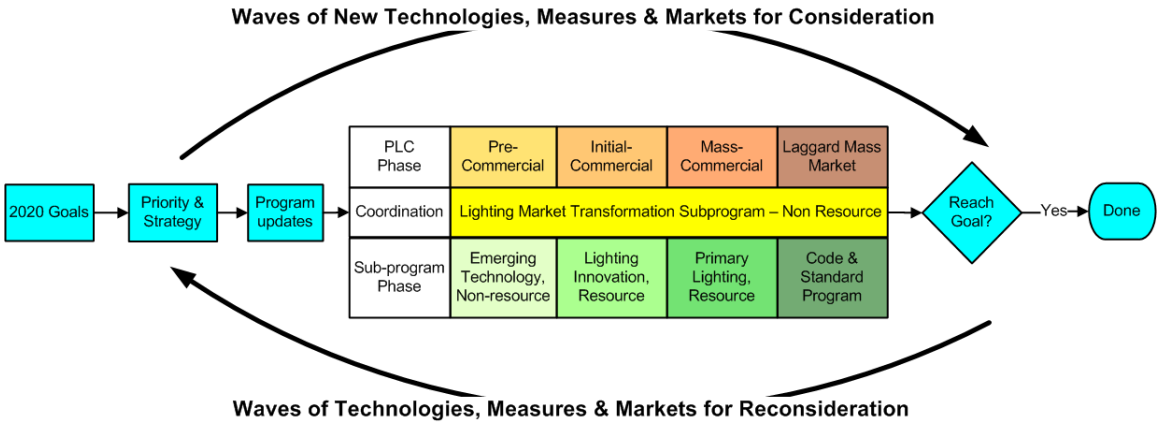
**10) Market Transformation Information**:

By its nature, market transformation occurs as a result of numerous factors and programs, not single sub-programs. Therefore, it is proposed that metrics for this programmatic effort be included within the broader metrics proposed at a program sector level. Please refer to the quantitative baseline and market transformation discussion, presented in the Statewide Lighting Program for details.

Product Life Cycle Concept




Lighting Market Transformation Framework




Market Transformation Indicators (MTIs)

| **Market Transformation Indicators (MTI)** | **Description (No Change)** |
|---|---|
| LMT-1-CIA | Number of energy efficiency measures introduced and sun-setted in IOU CIA programs since 2010. |
| LMT-2-Advanced Lighting | Average energy consumption of interior and exterior lighting applications in residential and non-residential buildings in California |
| LMT-3-BasicCFL | Basic CFLs sold annually as a percentage of all MSB, non-dimming interior bulbs sold in California. |
| LMT-4-BasicCFL | Price of non-discounted Energy Star® qualified MSB CFLs sold in California. |
| LMT-5-BasicCFL | Saturation of eligible sockets (MSB, non-dimming, |

| | |
|---|---|
| | interior) with (1) basic CFLs and (2) pre-defined advanced lighting options. |
| LMT-7 | Number of lighting technologies by sector that no longer require IOU program interventions. |

i. A summary of the market transformation objectives of the program.

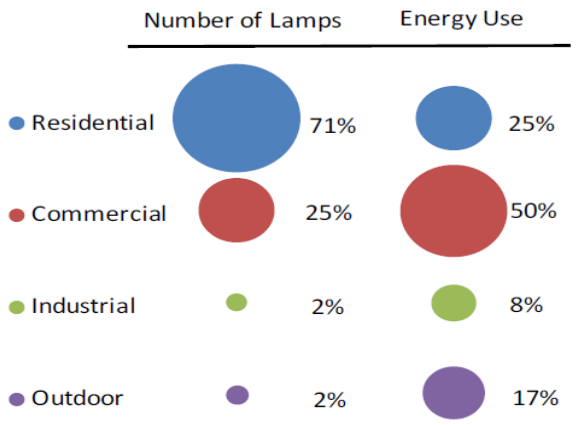
The objective of the Lighting Market Transformation program is to accelerate the adoption of new and innovative lighting measures and to prune matured lighting measures to meet program objectives. This portfolio of lighting program is designed to do the following:

- Be part of the solution to support the goals of the California Long-term Energy Efficiency Strategy and the goals identified in the Lighting Chapter (i.e., chapter 13).
- Develop specific program intervention strategies to overcome market barriers and to meet IOUs' energy savings objectives.
- Implement a rigorous process so this portfolio of programs will be seeking for advanced technologies, measures and markets to meet the wants/needs of customer sectors and policy directions.

ii. A description of the market, including identification of the relevant market actors and the relationships among them;

The lighting market dynamic is complex and many market actors are involved depending on the customer segments: (1) Residential and (2) Non-Residential. Residential usage accounts for 71% of the lamps by quantity but only 25% of lighting energy consumption. If outdoor lighting applications were set aside, commercial and industrial lighting would account for 27% of lamp quantities and 58% of lighting energy consumptions.

<u>Number of Lamps and Lighting Energy Consumption in the U.S., by Sector</u>



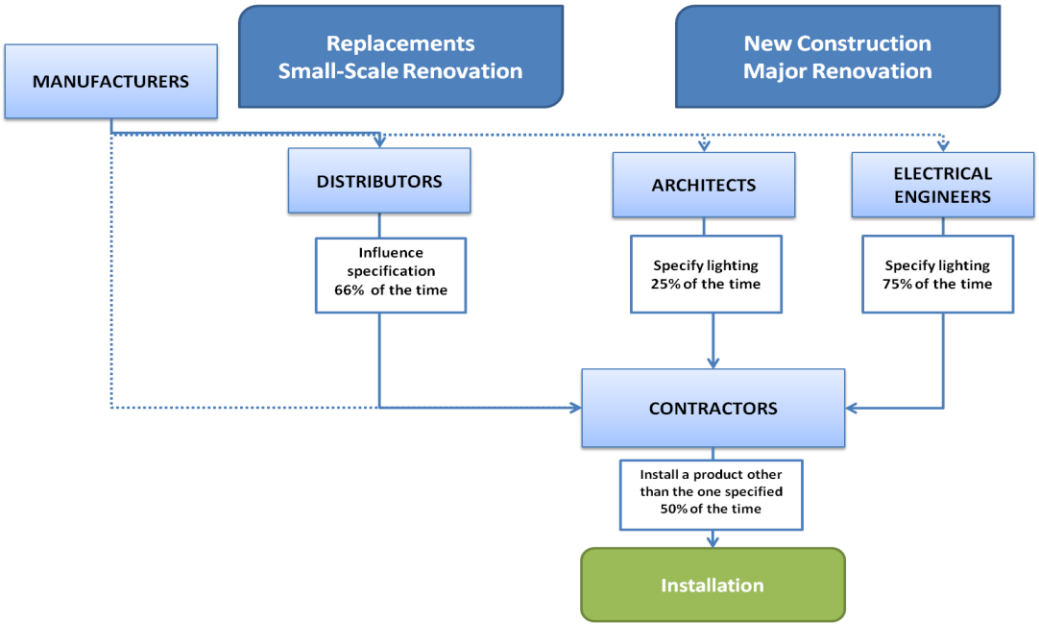
Source: Navigant Consulting, Inc. "2010 U.S. Lighting Market Characterization." U.S. DOE. January 2012.

Here are the market actors for the residential lighting market:

- Federal/state regulators and other standards bodies,
- Manufacturers,
- Retailers and other distributors,
- End-users.

The non-residential market and market actors are different than the residential sector. The non-residential market often involves all the residential lighting market actors, but also relies upon lighting distributors, building and project architects/engineers and contractor/installers, depending on the size of the project and business establishment.

Diagram: Non-Residential Stream of Influencers




Source: Xenergy, Inc. "Commercial and Industrial Lighting Study". Prepared for the Northwest Energy Efficiency Alliance. 2000.
Kema, Inc., et al. "High Bay Lighting Market Effects Study: FINAL REPORT." Prepared for the California Public Utilities Commission. June 18, 2010.

iii. A market characterization and assessment of the relationships/dynamics among market actors, including identification of the key barriers and opportunities to advance demand side management technologies and strategies;

The CLTEESP identified the following market barriers that could impede successful implementation of the above goals:

(1) **Policy Barriers** that conflict with the accelerated adoption of best practice lighting technologies and systems required to meet the state's ZNE goals;

(2) **Lack of knowledge** regarding best practice lighting technologies among installers and other lighting professionals;

(3) **Proprietary protocols** that can limit innovation and interoperability of lighting systems and integration with other building and network systems;

(4) **Lack of retailer and consumer awareness** about lighting's invisible benefits, such as contributions to human performance, well-being and energy and cost savings;

(5) **Cost** constraints, including the challenge of encouraging end users to purchase and install best-practice lighting technologies and systems;

(6) **Gaps in the Research, Development and Demonstration (RD&D) infrastructure** that cause redundancies and unnecessary delays in rapid deployment of best practice technologies to the market.

The Lighting Market Transformation Program cannot address all market barriers identified in the Strategic Plan, only market barriers 2, 4, 5, and 6.

iv. A description of the proposed intervention(s) and its/their intended results, and specify which barriers the intervention is intended to address;

This IOU program in collaboration with the Workforce Education and Training program can address the following barriers:

- **Lack of knowledge** regarding best practice lighting technologies among installers and other lighting professionals;
    - Intervention Opportunity: Provide education and training on lighting best practices to installers, contractors and other lighting professionals to improve awareness, knowledge and attitude (i.e., WET program, and Primary Lighting sub-program)
        i. Intended Results: improve the awareness, knowledge and attitude (AKA) of contractors, installers and lighting professionals concerning lighting best practices. This improvement in AKA,

will lead to program participation as well as spillover effects.

- **Lack of retailer and consumer awareness** about lighting's invisible benefits, such as contributions to human performance, well-being and energy and cost savings;
  - Intervention Opportunity: Provide education and training to retailers, distributors so they are armed with improved selling information and enhanced selling techniques (i.e., Primary Lighting sub-program)
    i. Intended Results: improve the AKA of lighting retailers and distributors concerning both energy and non-energy benefits of EE lighting measures.
- **Cost** constraints, including the challenge of encouraging end users to purchase and install best practice lighting technologies and systems;
- **Intervention Opportunity**: Provide an incentive to new and innovative lighting product where IOUs intervention would accelerate the movement of product life cycle (i.e., Primary Lighting sub-program)
  i. Intended Results: reduced prices for the targeted lighting products, leading to increasing purchase and installation of the program target measures. Overtime, the program helps reduce product costs, increase retailer shelf space, and variety of program qualified products. These effects will contribute to changes in the lighting market dynamic leading to lasting market change.

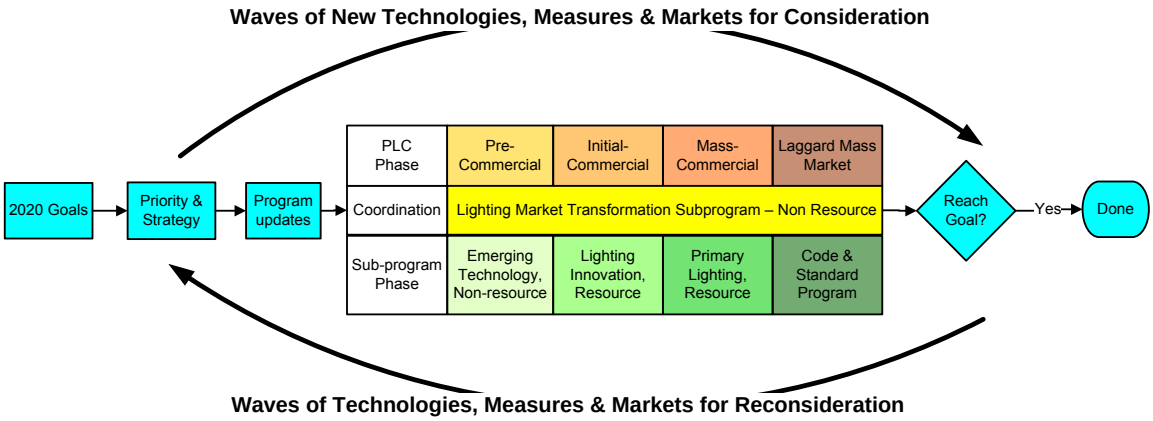
- **Gaps in the Research, Development and Demonstration (RD&D) infrastructure** that cause redundancies and unnecessary delays in rapid deployment of best practice technologies to the market.
  - Intervention Opportunity: Provide an environment to test and verify lighting technology to reduce performance uncertainty (i.e., lighting ETP activities and lighting Innovation sub-program).
    i. Intended Results: Reduce performance and market uncertainty of new lighting measures and practices. This information could be used to improve programmatic design so program delivery mechanism could be more effective in reaching target customers and markets.

v. A coherent program, or "market," logic model that ensures a solid causal relationship between the proposed intervention(s) and its/their intended results[1];

The Lighting Market Transformation programs are designed to use a market transformation framework to pull in new measures and

[1] If this logic model is the same as that requested in #10.(O), only provide once. As needed, provide a more detailed logic model emphasizing the market transformation elements of the program and/or how such elements integrate with resource acquisition elements.

technologies and to reconsider the more mature measures and technologies. The diagram below describes this iterative process.




Within this context, a decision making body is formed, a IOU Decision Panel is formed, to manage and guide this process. The following logic models will illustrate the interaction amongst the Lighting Market Transformation sub-program, Lighting Innovation sub-program and Primary Lighting sub-program. (Please refer to logic models later in this document)

vi. Appropriate evaluation plans and corresponding Market Transformation indicators and Program Performance Metrics based on the program logic model.

Due to the need to comply with the Decision's timeline for filing the 2013-2014 PIP, and our desire to comply with earlier Decisions that call for gathering stakeholder input in informing market transformation efforts, we suggest that a full market effects evaluation plan be developed during the formulation of the Joint EM&V Plan as described in section "18.1. Evaluation Budget" in Decision R.09-11-014. Until then, we suggest the following approach.

Summative evaluation: Market Effects. The market transformation program's theory and logic model will be used to guide the evaluation efforts. The scope of the market effects study should be defined by the MT program's scope. The timeline for specific market effects that are to be evaluated should be defined by the MT program theory. Among other indicators, the program theory may specify changes in market characteristics that can be evaluated, such as 1) spillover, 2) attitudes, awareness and knowledge, 3) reductions in a specific market barrier, 4) current pricing and product availability, and 5) other market milestones. We will make the following distinction between program "spillover" and market effects: spillover is energy savings not directly tracked by the

program, whereas market effects are broader and would include spillover as well as meaningful changes in the structure or functioning of the market.

Formative evaluation. The formative evaluation of a market transformation program is typically performed at the intervention (i.e. program) level. The methods are the same as would be used in a program process evaluation, and would include interviews with program staff, participants and non-participants as well as an assessment of the program's direct outputs.

Market transformation indicator results shall be reported, as available, by Energy Division or the IOUs, depending upon who conducts the necessary market studies. (Res. 4385, 12/2/10)

Attribution. Outside of California, most guidelines for evaluating market transformation acknowledge that it is very difficult to attribute market effects to any single program, and nearly impossible to partition out the respective contributions of several coordinated programs on market effects and market transformation. In California, the Framework (Sebold et al., 2001) emphasized that attribution of market effects to programs bears further research. Others (Rosenberg & Hoefgen, 2009; Keating & Prahl (MT Workshop, Nov 2011) suggest that declaring the program's strategic intent through the market transformation initiative's theory and logic model is key to establishing future claim on transformation effects. The methods proposed by Rosenberg & Hoefgen (2009) for attributing market effects to individual programs include a number of approaches, all of them qualitative: self-report of spillover and free ridership; cross-sectional comparisons with other geographic regions; structured expert judging; and case studies. But attribution using a "preponderance of evidence" approach would likely be expensive and still yield arguable results. Attribution by nature focuses on individual program efforts, and we believe the market transformation evaluation discourse should be focused on the overlapping synergy among all programs and influences in the market. We realize we all have a "Shared Mission" of meeting the CPUC's very aggressive Strategic Plan goals. We do not wish to not invest resources in teasing apart which program entity contributed how much, but instead will plan to focus on whether all the market forces across the State of California have succeeded in transforming the market.

**11) Additional information as required by Commission decision or ruling or as needed**

## ATTACHMENT 1

### Program Non-Energy Objectives

For New or Substantially changed programs and sub-programs, provide the following information for Program Non-Energy Objectives and follow the format used for the previous cycle Program Performance Metrics found in Resolution E-4385.

i. List the primary SMART[2] non-energy objectives of the program.

ii. For each SMART objective, identify the quantitative targets, direction or percent of change that you hope to achieve during the program cycle.[3]

iii. For each proposed SMART objective, describe any relevant baseline data on current market conditions that you have assembled or plan to assemble and the sources.

**iv. Quantitative program targets (PPMs):**

**Table 3: Quantitative Program Targets (PPMs)**

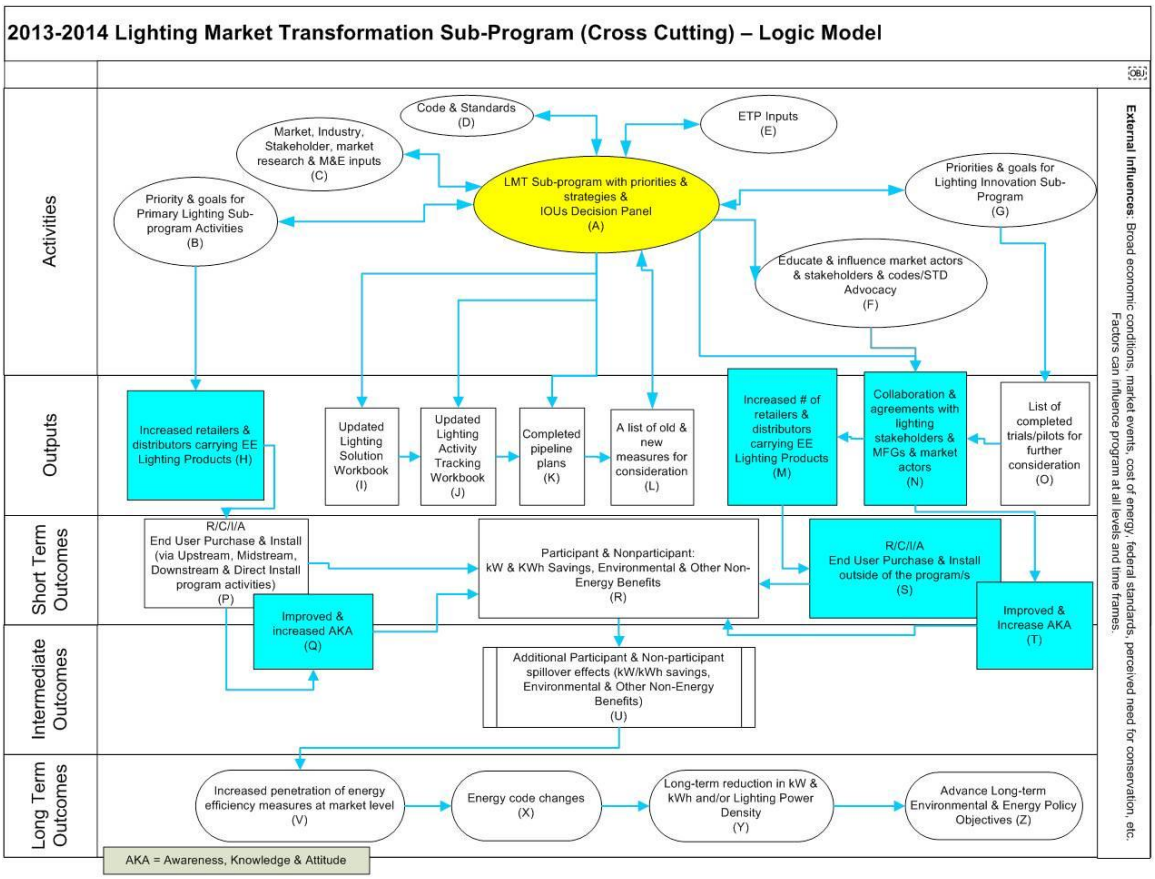
| Target | 2013 | 2014 |
|---|---|---|
| Update Lighting Solution Workbook for each program cycle, using available information from IOUs, Energy Division and external parties; and report progress in the LMT annual report. (Y/N) | | |
| Develop a lighting program communication plan to communicate IOUs lighting program's priorities and strategies, updated pipeline plans, and other information resources before the end of 2013; and report progress in the 2014 LMT annual report. (Y/N) | | |
| Update Lighting Activity Workbook, quarterly or as information become available; and report progress in the LMT annual report (Y/N) (i.e., this is a tracking of lighting related activities, such as ETP projects, Lighting Innovation trial studies, Codes and Standards Enhancement Studies, and LMT partner activities) | | |
| Provide number of EE lighting measures added, removed, or updated as a result of LMT activities and influence; and report in LMT annual report | | |

[2] A SMART objective is one that is **S**pecific (i.e. quantitative and quantifiable generally, in terms of the results to be achieved**), M**easurable, **A**mbitious, **R**ealistic, and **T**ime-bound. For example, for a vender training component of an innovative commercial program, two SMART mid-term objectives and one long-term objective might be:

[3] Please also add any new program objectives and quantitative targets for statewide programs to the portfolio PPM/MTI reporting template.

Please revert to the previous 2010-2012 PPMs as needed. These PPMs have minor updates to make them current and applicable to the 2013-2014 cycle.

## ATTACHMENT 2



## ATTACHMENT 3

**Table 1: Projected Sub-Program Budget, by Calendar Year**

| | Program Year | | |
|---|---|---|---|
| **Sub-Program** | **2013** | **2014** | **Total** |
| Admin ($) | Deferring to Reg (Finance) | | |
| General overhead ($) | | | |
| Incentives ($) | | | |
| Direct Install Non-Incentives ($) | | | |
| Marketing & Outreach ($) | | | |
| Education & Training | | | |
| Total Budget | TBD | TBD | |

**Table 2: Projected Sub-Program Net Energy and Demand Impacts, by Calendar Year**

| | Program Years | | |
|---|---|---|---|
| | **2013** | **2014** | **Total** |
| **Sub-program Name** | Deferring to Reg (Analytics) | | |
| GWh | | | |
| Peak MW | | | |
| Therms (millions) | | | |

Individual utility specific information to be provided in this table

**Table 4: Work paper Status**

| # | Workpaper Number/Measure Name | Approved | Pending Approval | Submitted but Awaiting Review |
|---|---|---|---|---|
| 1 | TBD | x | | |
| 2 | | x | | |
| 3 | | | x | |
| 4 | | | x | |
| 5 | | | | x |
| 6 | | | | x |

**Table 5: Sub-Program Milestones and Timeline**

| Milestone | Date |
|---|---|
| LMT Program Annual Report - 2013 | 6/3/2013 |
| LMT Program Communication Plan | 12/31/2013 |
| LMT Program Annual Report - 2014 | 6/2/2014 |

**Table 6: Geographic Regions**

| Geographic Region | [Insert Program/Sub-Program Name] |
|---|---|
| CEC Climate Zone 1 | Not Applicable; non-resource program |
| CEC Climate Zone 2 | |
| CEC Climate Zone 3 | |
| CEC Climate Zone 4 | |
| CEC Climate Zone 5 | |
| CEC Climate Zone 6 | |
| CEC Climate Zone 7 | |
| CEC Climate Zone 8 | |
| CEC Climate Zone 9 | |
| CEC Climate Zone 10 | |
| CEC Climate Zone 11 | |
| CEC Climate Zone 12 | |
| CEC Climate Zone 13 | |
| CEC Climate Zone 14 | |
| CEC Climate Zone 15 | |
| CEC Climate Zone 16 | |

**Table 7: Program Administration of Program Components**

| Program Name | Program Component | Implemented by IOU Staff? (X = Yes) | Implemented by contractors to be selected by competitive bid process (if Yes then enter type of contractor/other market actor possibly used) | Implemented by contractors NOT selected by competitive bid process (list prime contractor and sub-contractor names) | Implemented by local government or other entity ( X = Yes) |
|---|---|---|---|---|---|
| Lighting Market Transformation | LMT Program | | | | |

| | | | | | |
|---|---|---|---|---|---|
| | Implementation/Coordination with other IOU programs and LMT Stakeholders | | | | |
| | | | | | |
| Below are program projects/studies, not sure if they are applicable for this table. | | | | | |
| Lighting Market Transformation | Lighting Solution Workbook | | Consultant, TBD | Consultant, TBD | |
| Lighting Market Transformation | Lighting Activity Workbook | | Consultant, TBD | Consultant, TBD | |
| Lighting Market Transformation | Lighting Solution Pipeline Plans | | Consultant, TBD | Consultant, TBD | |
| Lighting Market Transformation | Other Studies TBD | | Consultant, TBD | Consultant, TBD | |

**Table 8: Customer Eligibility Requirements (Joint Utility Table)**

| **Customer Eligibility Requirement (list of requirements)** | **PGE** | **SCE** | **SDGE** | **SCG** |
|---|---|---|---|---|
| Not Applicable; non-resource program | | | | |
| | | | | |
| | | | | |
| | | | | |
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| | | | | |
| | | | | |

The utilities must work together and submit this table jointly in their respective applications

**Table 9: Contractor Eligibility Requirements (Joint Utility Table)**

| **Contractor Eligibility Requirement (list of requirements)** | **PGE** | **SCE** | **SDGE** | **SCG** |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| Not Applicable; non-resource program | | | | |
| Proven business entity validity, established clientele | | | | |
| Demonstrated track record | | | | |
| Competence demonstrated in the application process (certified training, license, etc) | | | | |

List any contractor (and/or developer, manufacturer, retailer or other "participant") eligibility requirements (e.g. specific IOU required trainings; specific contractor accreditations; and/or, specific technician certifications required).
The utilities must work together and submit this table jointly in their respective applications

**Table 10: Manufacturer/Retailer/Distributor Partners**

| Manufacturer/Retailer/Distributor Partner Information | PGE | SCE | SDGE | SCG |
|---|---|---|---|---|
| Not Applicable; non-resource program | X | X | X | |

**Table 11: Summary Table of Measures, Incentive Levels and Verification Rates**

| Measure Group | Market Actor Receiving Incentive or Rebate | PGE | | SCE | | SDGE | | SCG | |
|---|---|---|---|---|---|---|---|---|---|
| | | Incentive Level | Installation Sampling Rate | Incentive Level | Installation Sampling Rate | Incentive Level | Installation Sampling Rate | Incentive Level | Installation Sampling Rate |
| Not Applicable; non-resource program | | X | X | X | X | X | X | | |

**Table 12: Additional Services**

| Additional Services that the Sub-Program Will Provide | To Which Market Actors | PGE | SCE | SDGE | SCG |
|---|---|---|---|---|---|
| LMT Program does not fund/provide services directly to customers. LMT coordinates with programs such as Primary Lighting, Lighting Innovation, ME&O, and WE&T that provide such services. | Other IOU Programs | | No Funding | | |
| Share/Distribute Lighting/Controls Information with Stakeholders | Federal, State, and Local Government Organizations | | No Funding | | |

| | | | | | |
|---|---|---|---|---|---|
| Share/Distribute Lighting/Controls Information with Stakeholders | Energy and Lighting Industry Organizations | | No Funding | | |
| Share/Distribute Lighting/Controls Information with Stakeholders | Universities and Academia | | No Funding | | |
| Share/Distribute Lighting/Controls Information with Stakeholders | Manufacturers | | No Funding | | |
| Share/Distribute Lighting/Controls Information with Stakeholders | Sales Channels | | No Funding | | |
| Share/Distribute Lighting/Controls Information with Stakeholders | Advocacy Groups | | No Funding | | |
| Share/Distribute Lighting/Controls Information with Stakeholders | Other Utilities | | No Funding | | |
| Training on SW Lighting Program Structures & Processes | Upstream / Midstream Downstream participant | | | X | |

For each service provided, indicate any expected charges to market actors of the services, and/or the level at which any such services will be incented or funded.

### Table 13: Program Related Audits

| Levels at Which Program Related Audits Are Rebated or Funded | Who Receives the Rebate/Funding (Customer or Contractor) |
|---|---|
| Not Applicable | |

### Table 14: Quality Assurance Provisions

| QA Requirements | QA Sampling Rate (Indicate Pre/Post Sample) | QA Personnel Certification Requirements |
|---|---|---|
| QA requirements #1 | Not Applicable | |

### Table 15: Cross-cutting Sub-program and Non-IOU Partner Coordination

| Lighting Market Transformation | | |
|---|---|---|
| **Other IOU Sub-program Name** | **Coordination Mechanism** | **Expected Frequency** |

| | | |
|---|---|---|
| Statewide LMT Sub-Program | Meetings, Calls & Emails | Generally monthly and as needed |
| Lighting Innovation Sub-Program | Meetings, Calls & Emails | Generally weekly and as needed |
| Primary Lighting Sub-Program | Meetings, Calls & Emails | Generally weekly and as needed |
| Emerging Technologies Program | Meetings, Calls & Emails | Generally monthly and as needed |
| Codes and Standards Program | Meetings, Calls & Emails | Generally monthly and as needed |
| Marketing Education & Outreach | Meetings, Calls & Emails | Generally monthly and as needed |
| Workforce Education & Training | Meetings, Calls & Emails | Generally monthly and as needed |
| **Coordination Partners Outside CPUC** | | |
| LMT Stakeholder Meetings | Meetings | Annually |
| LMT Key Partner Meetings | Meetings, Calls & Emails | Generally three times annually and as needed |
| West Coast Utilities Lighting Teams | Meetings | Three times annually |
| Consortium for Energy Efficiency | Meetings, Calls & Emails | Three times annually |
| ENERGY STAR | Meetings, Calls & Emails | Twice annually |
| Department of Energy Solid State Lighting Workshops | Workshops/Meetings | Annually |
| Lighting Industry Conferences | Conferences/Meetings | Annually |
| DesignLights Consortium | Group Meetings, Calls and Email | Twice annually |
| California Lighting Technology Center | Group Meetings, Calls and Email | As needed, roughly twice yearly |

## Table 16: Non-EE Sub-Program Information

| **Sub-Program Name** | | |
|---|---|---|
| **Non-EE Sub-Program** | **Budget** | **Rationale and General Approach for Integrating Across Resource Types** |
| Not Applicable | | |

1) **Sub-Program Name:** Lighting Innovation
**Sub-Program ID number:** SDG&E
**Type of Sub-Program: _✓_Core __Third Party __Partnership**

2) **Market sector or segment that this sub-program is designed to serve:**

a. _✓_ Residential
   i. Including Low Income? _✓_ Yes __ No
   ii. Including Moderate Income? _✓_ Yes __ No
   iii. Including or specifically Multifamily buildings _✓_ Yes __ No
   iv. Including or specifically Rental units? _✓_ Yes __ No
b. _✓_ Commercial (List applicable NAIC codes: _____)
c. _✓_ Industrial (List applicable NAIC codes: _____)
d. _✓_ Agricultural (List applicable NAIC codes: _____)

3) **Is this sub-program primarily a:**
a. Non-resource program __✓_ Yes__ No
b. Resource acquisition program _✓__ Yes ___ No
c. Market Transformation Program __✓_ Yes ___ No

4) **Indicate the primary intervention strategies:**

a. Upstream ___ Yes ___ No
b. Midstream _✓__ Yes ___ No
c. Downstream ___ Yes ___ No
d. Direct Install _✓_ Yes __ No
e. Non Resource _✓_ Yes __ No

5) **Projected Sub-program Total Resource Cost (TRC) and Program Administrator Cost (PAC):** TRC: PAC :

6) **Projected Sub-Program Budget:**

**Table 1: Projected Sub-Program Budget, by Calendar Year:**

| | Program Year | | |
|---|---|---|---|
| **Sub-Program** | **2013** | **2014** | **Total** |
| Admin ($) | | | |
| General overhead ($) | | | |
| Incentives ($) | | | |
| Direct Install Non-Incentives ($) | | | |
| Marketing & Outreach ($) | | | |
| Education & Training | | | |
| Total Budget | | | |

**7) Sub-Program Description, Objectives and Theory:**

**a) Sub-Program Description and Theory:**

Working in collaboration with the Lighting Market Transformation sub-program, the Lighting Innovation sub-program is designed as an intermediary step to foster markets for measures that are more mature than those being developed under the Emerging Technologies Program but less so than those in the Primary Lighting sub-program. It will develop medium scale demonstration projects and trial studies to identify measures and program models that will potentially be supported in the Primary Lighting sub-program. Trial studies will help identify promising program design approaches and delivery mechanisms that have not been fully examined in the past to closely satisfy consumer lighting needs.

Each IOU may offer incentives on a different mix of products depending on the specific goals established in a trial study. Thus the Lighting Innovation sub program measures may bring in a blend of newly introduced technologies and measures that reflect the Primary Lighting sub-program offerings.

The Lighting Innovation sub-program will primarily support advanced lighting technologies and approaches aimed at early adopters. This subprogram provides the dedicated resources to help these innovative lighting technologies bridge the "chasm" between the early adopters and the early majority. From the early stages of product development, promising measures that exit the Emerging Technologies Program might transition to the Lighting Innovation sub-program for further market development. It will also target promising measures that become available in the market due to adequate manufacturer production levels and the intent of resellers to make the products available. These products could include those that were brought to market without first being included in the Emerging Technologies Program. Additionally some measures already in the Primary Lighting sub-program may overlap or be transitioned to the Lighting Innovation sub-program, such as in instances where there is a need to assess viability of other program delivery mechanisms.

Lighting remains a significant opportunity in terms of economic potential for California's electricity consumers. To develop strategies to continue to tap economic potential, the Lighting Innovation sub-program will be implemented in close alignment with the Lighting Market Transformation sub-program strategic lighting initiative. The Lighting Market Transformation sub-program will provide guidance to the Lighting Innovation sub-program in the development of pilots, trials, and scaled field projects aimed at achieving goals of the Strategic Plan.

Within California's energy efficiency policy, and as outlined in the Strategic Plan, it is important to address the energy intensity within the commercial, agriculture, industrial, and residential sectors. The sub-program will incorporate this theme to help drive its vision.

A major thrust of the technology segment under the Lighting Innovation sub-program is to attempt a more structured deployment of scaled market trial. Project deliverables will be defined by the Lighting Market Transformation sub-program with the goal of fulfilling the Primary Lighting sub-program's short and long term goals. At the same time, the sub-program attempts to increase the IOU's knowledge of market barriers of potential lighting technologies that suffer from poor market adoption. Moreover, the Lighting Innovation sub-program will work in partnership with the Emerging Technologies program in the execution of lighting related technology assessment projects.

The lighting Innovation Program is designed as part of the overall Lighting Market Transformation process. This sub-program is designed to (1) verify the new technology/product or delivery model recommendations, (2) design trials and pilots to test them, (3) design scaled field trials to gather workpapers data or programmatic design information. This information will be fed into the Primary Lighting Program for further action.

The Lighting Innovation sub-program shares the same list of market barriers identified in the Primary Lighting Sub-program.

**b) Sub-Program Energy and Demand Objectives**

**Table 2: Projected Sub-Program Net Energy and Demand Impacts, by Calendar Year**

| | Program Years | | |
|---|---|---|---|
| | **2013** | **2014** | **Total** |
| **Sub-program Name** | | | |
| GWh | | | |
| Peak MW | | | |
| Therms (millions) | | | |

**c) Program Non-Energy Objectives**:
The Lighting Innovation sub-program is primarily a resource program that employs several non-resource activities. It will pursue to claim energy savings on measures that have approved work papers and will attempt to report ex ante savings on potential projects whenever possible.

Due to the nature of the program, quantitative savings targets will not be the major indicator of program success. Instead program accomplishments will be determined using program non-energy objectives reflected on the PPMs.

**d) Cost Effectiveness/Market Need**:

**e) Measure Savings/ Work Papers**:

a. Indicate data source for savings estimates for program measures (DEER, custom measures, etc).

b. Indicate work paper status for program measures:

**Table 4: Work paper Status**

See Attachment 3

**8) Program Implementation Details**

**a) Timelines:**

**Table 5: Sub-Program Milestones and Timeline**

See Attachment 3

**b) Geographic Scope**:

**Table 6: Geographic Regions Where the Program Will Operate**

See Attachment 3

**c) Program Administration**

**Table 7: Program Administration of Program Components**

See Attachment 3

**d) Program Eligibility Requirements:**

**i. Customers:**

**Table 8: Customer Eligibility Requirements**

See Attachment 3

**ii. Contractors/Participants:**

**Table 9: Contractor/Participant Eligibility Requirements**

See Attachment 3

**e) Program Partners:**

**a. Manufacturer/Retailer/Distributor partners:**

**Table 10: Manufacturer/Retailer/Distributor Partners**

See Attachment 3

**b. Other key program partners:**

**f) Measures and incentive levels**:

**Table 11: Summary Table of Measures, Incentive Levels and Verification Rates**

See Attachment 3

a. Indicate the expected incentive level by measure or measure grouping.
b. For each incented or rebated measure, indicate the market actor to whom this will be provided.

**g) Additional Services:**

a. For each service provided, indicate any expected charges to market actors of the services, and/or the level at which any such services will be incented or funded.

**Table 12: Additional Services**

See Attachment 3

**h) Sub-Program Specific Marketing and Outreach:**

Marketing and outreach plans will vary for each program trial and demonstration project. The Lighting Innovation sub -program will tap various marketing methods as appropriate, including multi-program brochures, web pages, bill inserts and partner with retail, manufacturer or distributor marketing initiatives where applicable to promote trials and demonstration projects. These efforts will pay special attention to education and exposure of customers to new measures recently introduced in the market. The sub-program will work very closely with the Primary Lighting and Lighting Market Transformation sub-programs to coordinate marketing tactics to ensure that delivery of messages are consistent with the Statewide Lighting Programs' overall goals and that appropriate strategies are implemented based on the unique needs of a specific market sector.

Public awareness of the program will be enhanced through activities including referrals from the Home Energy Guide, the statewide IOU joint marketing and outreach campaign, income-qualified programs, and other DSM activities.

**i) Sub-Program Specific Training:**

Lighting Innovation sub-program will require unique training requirements for each trial or demonstration project. However, general training modules will be developed to ensure program compliance and contractor/vendor/participant understanding of program parameters.

**j) Sub-Program Software and/or Additional Tools:**

a. List all eligible software or similar tools required for sub-program participation.

The Lighting Innovation sub-program will not invest in any custom software applications since trial activities are mostly exploratory in nature. The program will use standard MS Office Applications and any applicable systems/database currently being utilized by IOUs.

b. Indicate if pre and/or post implementation audits will be required for the sub-program.
Pre-implementation audit required ___ Yes ___ No
Post-implementation audit required _✓_ Yes ___ No

c. As applicable, indicate levels at which such audits shall be rebated or funded, and to whom such rebates/funding will be provided (i.e. to customer or contractor).

**Table 13: Post-implementation Audits**

See Attachment 3

**k) Sub-Program Quality Assurance Provisions:**

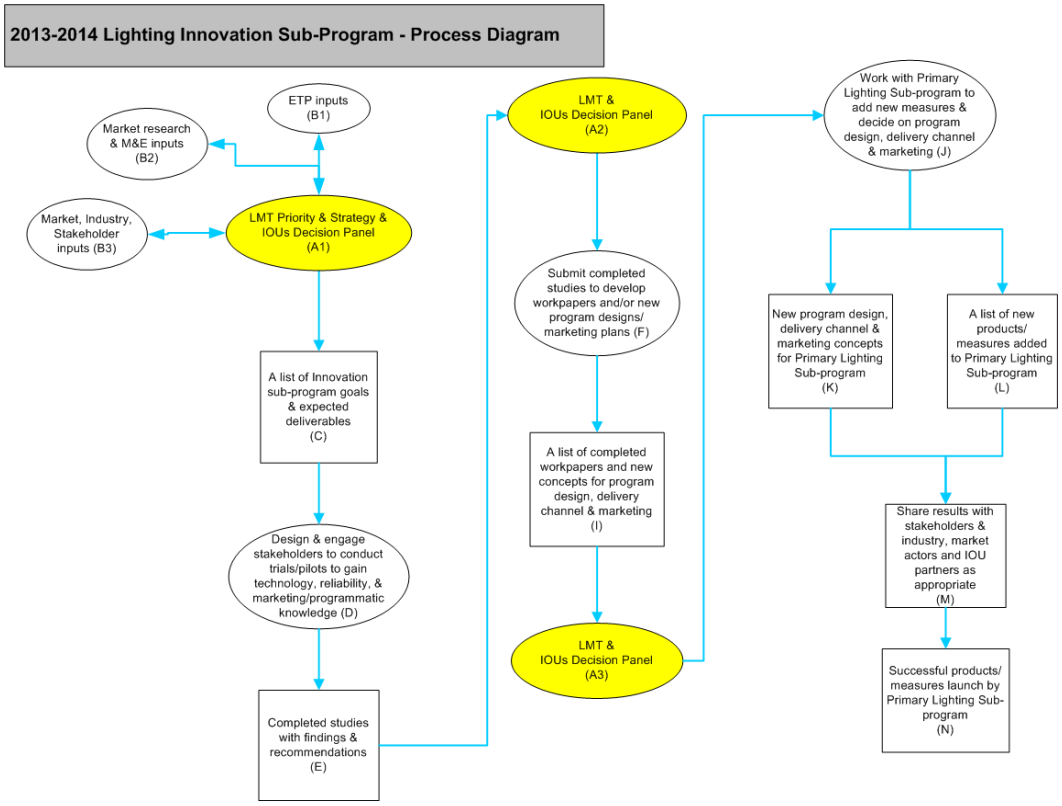
**Table 14: Quality Assurance Provisions**

See Attachment 3

**l) Sub-program Delivery Method and Measure Installation /Marketing or Training:**

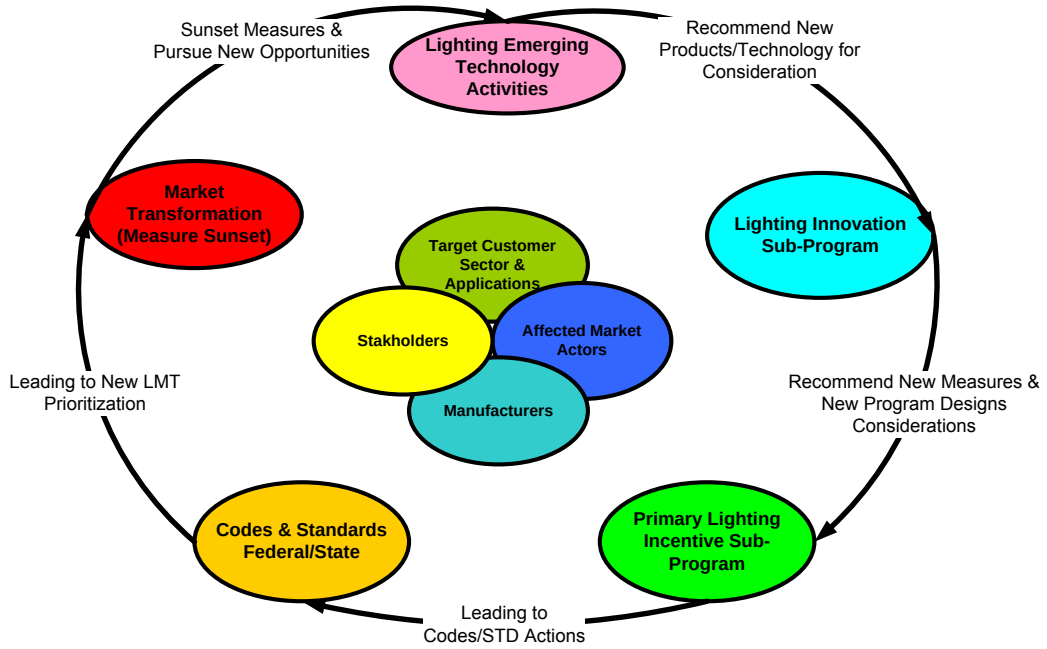
The Lighting Innovation sub-program will be divided into two operational segments. The program/customer segment will focus on trials and pilots that examine program designs, models, and implementation tactics so successful methods of reaching customers can be transitioned to the Primary Lighting sub-program. The technology segment, on the other hand, will be the sub-program's demonstration arm designed at launching technology trials, scaled field placements, and showcases to evaluate effectiveness of new products/measures through early market activities, and in the end-use environment. This will help to collect data for potential larger scaled deployment. Each segment will attempt to develop and classify projects within the Residential and Non-Residential sectors, through both Interior and Exterior applications.

## m) Sub-program Process Flow Chart:



**n) Cross-cutting Sub-program and Non-IOU Partner Coordination:**

**Table 15: Cross-cutting Sub-program and Non-IOU Partner Coordination**




**o) Logic Model:**
See Attachment 2

The Innovation sub-program serves the function of taking new measures fed into it by the IOU decision panel and getting them ready for entry into production programs. This involves doing market research and M&E studies, conducting trials and pilots to gain knowledge about reliability and marketing approaches, etc and developing workpapers and new program designs and marketing plans. Based on the knowledge gained from these activities, the products are introduced to the market through widespread programs, which leads to purchases by participants and non-participants. The program designs include strategies to overcome barriers so that retailers are willing to stock the products and consumers are willing to purchase them. The logic model then reflects the fact that when some consumers have purchased the products, further barriers, such as attitudinal barriers will come down and they will buy more with and without the program.

## 9) Additional Sub-Program Information

**a) Advancing Strategic Plan Goals and Objectives**:
The Lighting Innovation sub-program's objectives and strategies are defined below.

**Objective-1**: Conduct trials/pilots to test new technologies/applications/program models to determine what new products, measures, or approaches can be successfully transitioned to the Primary Lighting sub-program

- Strategy-1-1: Implement technology trials and pilots to evaluate effectiveness of new products/measures in the end-use environment to collect data for a scaled deployment
  - Conduct demonstration and pilot projects or market trial studies of measures in the very early stages of product commercialization.
  - The intent of these trials/pilots is to collect end-user preference and purchase-behavior data so the information could aid future product and program design
  - Launch scaled field placement trials/pilots for products/measures that have successfully completed technology application assessment

**Objective-2**: Conduct trials/pilots to test program designs and implementation so successful methods can be transitioned to the Primary Lighting sub-program

- Strategy-2-1: Implement program trials and pilots to test customer choice preferences, price elasticity, promotional approaches, educational messaging, and program delivery methods.
  - The other benefit of the scaled field placement trials/pilots is to test the quality and quantity of products/measures and available distribution channels.
  - Test different program models to analyze their viability for future program designs and evaluate their impact to the program's overall cost effectiveness metrics.

**Objective-3**: Share new products/measures knowledge learned from trials/pilots with end-users and market actors

- Strategy-3-1: Support education training and outreach efforts to promote information garnered from the pilots/trials
  - Participate in industry wide conferences meetings and workshops for information sharing,
  - Help in development of new and innovative Workforce Education and Training classes and events,
  - Take part in stakeholder and market actor events and conferences
  - Work closely with the Lighting Market Transformation sub-program to efficiently disseminate information to the appropriate industry stakeholders.
  - Provide feedback to lighting manufacturers for continuous improvement in lighting product design for better market adoption

**b) Integration**

**i. Integrated/coordinated Demand Side Management**:

Lighting Innovation sub program will continue to collaborate with the marketing and outreach programs to ensure that sub program

demonstration and trial outcomes are shared to internal and external stakeholders to increase customer education and program participation across DSM product offerings.

This program also has a direct link to the Lighting Market Transformation initiative, which has a component for WE&T activities. Although this program's primary focus is demonstration of newly commercialized technologies, the WE&T programs can be a significant instrument in sharing new products/measures knowledge learned from trials/pilots with end-users and market actors.

**Table 16: Non-EE Sub-Program Information**

See Attachment 3

**ii. Integration across resource types**.

The program will pursue opportunities for expansion as they arise.

**c) Leveraging of Resources**:

The IOUs work with ENERGY STAR®, the Consortium for Energy Efficiency (CEE), the Design Lights Consortium (DLC), the California Lighting Technology Center (CLTC), and the California Energy Commission (CEC) to further their visions, goals, and priorities in the application of energy-efficient lighting as well as regional groups such as the West Coast Utility Lighting Collaborative. The IOUs serve on the steering committees, review panels, and working groups of such organizations. The IOUs also serve on the DOE Solid State Lighting Workshop committee and has been an important contributor of various solid state lighting initiatives. Program staff is also involved with activities of the CLTC by providing sample products, attending meetings, using its expertise, and working as a team in industry relations.

**d) Trials/ Pilots:**

Several program trial concepts are planned within the Lighting Innovation sub-program. The list below is merely to show a flavor for potential trials and is not comprehensive.

- The 2010 – 2012 Web Trial under the Advanced Lighting Program will be expanded to include more energy efficient lighting measures under the Primary Lighting sub-program. The Web Trial will allow customers within the utility service territories to purchase energy efficient lighting products online through qualifying web sites. The trial will test midstream and upstream approaches using specialty online retailers and big box stores with an established online presence as distribution channels. Various online marketing and outreach tactics will also be deployed in conjunction with the Web Trial to identify how these treatments impact

sales as compared to the traditional Primary Lighting program delivery mechanism.

- The Lighting Innovation sub-program will explore a Midstream approach targeting groups such as distributors, contractors, and /or manufacturer reps as delivery channels for commercial non-residential measures. The trial will study program design feasibility and the effectiveness of offering incentives using a buy down strategy through distribution of energy efficient lighting products. The trial will seek to understand the complex commercial lighting channels and develop a strategy to best influence the specification lighting industry.
- The Program will look into a "Sustainable Office Lighting" concept that will provide incentives for office retrofit projects aimed at reducing lighting energy use for Class A office environments. This trial will incentivize projects based on percentage of energy reduced as a result of replacing inefficient fixtures with alternative energy efficient lighting sources. Additional incentives will also be provided for projects utilizing certified CALCTP contractors to ensure proper installation of these products in the field. The trial will target medium to large size organizations as well as state run offices.

A major thrust of the technology segment under the Lighting Innovation sub-program is to attempt a more structured deployment of scaled field trials. Project deliverables will be defined by the Lighting Market Transformation sub-program with the goal of fulfilling the Primary Lighting sub-program's short and long term goals. At the same time, the sub-program attempts to increase the IOU's knowledge of market barriers of potential lighting technologies that suffer from poor market adoption. Moreover, the Lighting Innovation sub-program will work in partnership with the Emerging Technologies program in the execution of lighting related technology assessment projects. Below are some examples of projects the IOUs might consider for demonstration purposes. This list is not comprehensive and may be modified as a result of changing market needs.

- General lighting field projects using a combination of LED lighting and controls will be selected for field demonstration projects. These projects will identify various sectors where a significant level of energy use can be reduced with the replacement of inefficient lighting fixtures and introduction of LED lighting and controls. The project will attempt to gather data relating to EE savings generated, occupancy levels, consumer behavior, customer satisfaction, installation barriers and other information that will help substantiate base line figures for work paper development. It will also identify different methods in calculating energy savings using an energy use performance based approach.
- Hi-Bay lighting control demonstration projects for warehouse and manufacturing settings will be assessed to identify potential energy savings generated and other factors that may influence technology adoption such as workers' overall working condition as well as barriers to field installations.

Where possible, the sub-program attempts to drive demand in sectors where adoption of commercialized energy efficient lighting technologies has not realized its full market potentials.

**e) Knowledge Transfer:**

The Lighting Innovation sub-program values employing "best practice" approaches in implementing program trials and demonstration projects. As such, the Program Managers will actively work with other utilities and industry stakeholders to leverage resources and learn from each other's accomplishments to maximize resources and avoid duplication of efforts in the deployment of energy efficiency projects. It will also utilize any available database such as the project tracking tool developed by Lighting Market Transformation to monitor current utility and non-utility initiatives.

**10) Market Transformation Information**:

i. A summary of the market transformation objectives of the program.

The objective of the program is to accelerate the adoption of new and innovative lighting measures, to aggressively promote existing effective measures, and to prune matured lighting measures with reduced potential to meet program objectives. This program is designed to do the following:

(1) Be part of the solution to support the goals of the California Long-term Energy Efficiency Strategy and the goals identified in the Lighting Chapter (i.e., chapter 13).

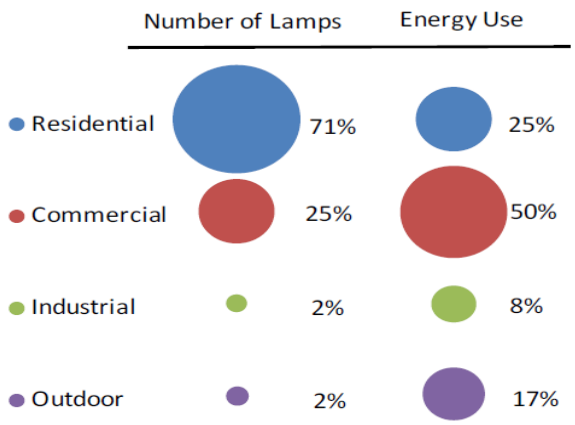
(2) Develop specific program intervention strategies to overcome market barriers and to meet IOUs' energy savings objectives.

(3) Implement a rigorous process so this program will be seeking for advanced technologies, measures and markets to meet the wants/needs of customer sectors and fulfill policy directions.

ii. A description of the market, including identification of the relevant market actors and the relationships among them;

The lighting market dynamic is complex and many market actors are involved depending on the customer segments: (1) Residential and (2) Non-Residential. Residential usage accounts for 71% of the lamps by quantity but only 25% of lighting energy consumption. If outdoor lighting applications were set aside, commercial and industrial lighting would account for 27% of lamp quantities and 58% of lighting energy consumptions.

Number of Lamps and Lighting Energy Consumption in the U.S., by Sector



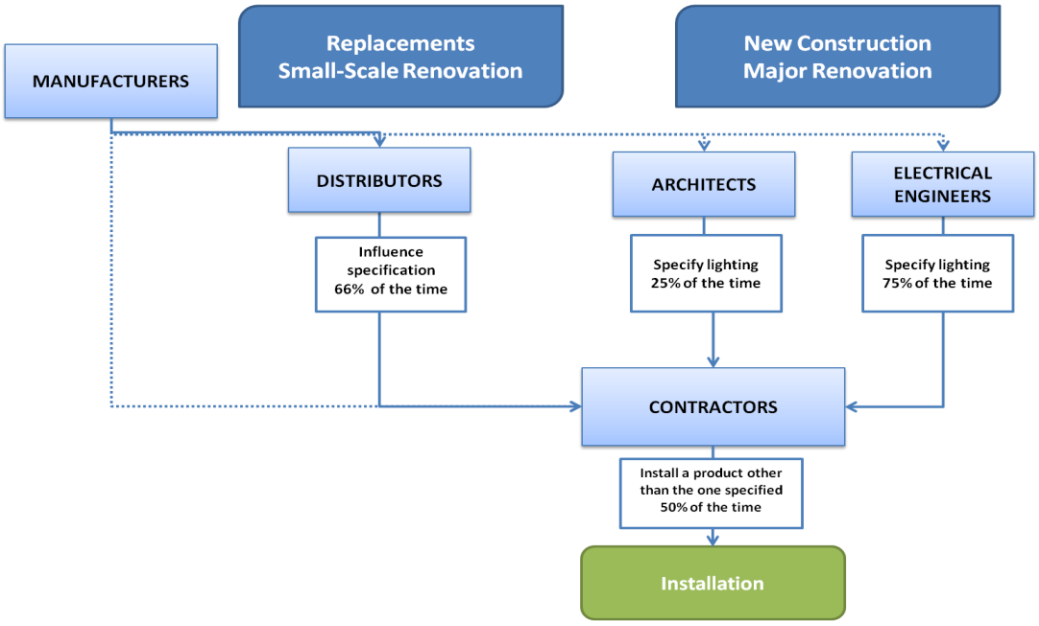

Source: Navigant Consulting, Inc. "2010 U.S. Lighting Market Characterization." U.S. DOE. January 2012.

Here are the market actors for the residential lighting market:

1. Federal/state regulators and other standards bodies,
2. Manufacturers,
3. Retailers and other distributors,
4. End-users.

The non-residential market and market actors are different than the residential sector. The non-residential market often involves all the residential lighting market actors, but also relies upon lighting distributors, building and project architects/engineers and contractor/installers, depending on the size of the project and business establishment.

Diagram: Non-Residential Stream of Influencers




Source: Xenergy, Inc. "Commercial and Industrial Lighting Study". Prepared for the Northwest Energy Efficiency Alliance. 2000.
Kema, Inc., et al. "High Bay Lighting Market Effects Study: FINAL REPORT." Prepared for the California Public Utilities Commission. June 18, 2010.

iii. A market characterization and assessment of the relationships/dynamics among market actors, including identification of the key barriers and opportunities to advance demand side management technologies and strategies;

The CLTEESP identified the following market barriers that could impede successful implementation of the above goals:

(1) **Policy Barriers** that conflict with the accelerated adoption of best practice lighting technologies and systems required to meet the state‘s ZNE goals;
(2) **Lack of knowledge** regarding best practice lighting technologies among installers and other lighting professionals;
(3) **Proprietary protocols** that can limit innovation and interoperability of lighting systems and integration with other building and network systems;
(4) **Lack of retailer and consumer awareness** about lighting‘s invisible benefits, such as contributions to human performance, well-being and energy and cost savings;

(5) **Cost** constraints, including the challenge of encouraging end users to purchase and install best-practice lighting technologies and systems;

(6) **Gaps in the Research, Development and Demonstration (RD&D) infrastructure** that cause redundancies and unnecessary delays in rapid deployment of best practice technologies to the market.

iv. A description of the proposed intervention(s) and its/their intended results, and specify which barriers the intervention is intended to address;

This IOU program can address the following barriers:

- **Lack of knowledge** regarding best practice lighting technologies among installers and other lighting professionals;
    - Intervention Opportunity: Provide education and training on lighting best practices to installers, contractors and other lighting professionals to improve awareness, knowledge and attitude.
        i. Intended Results: improve the awareness, knowledge and attitude (AKA) of contractors, installers and lighting professionals concerning lighting best practices. This improvement in AKA, will lead to program participation as well as spillover effects.

- **Lack of retailer and consumer awareness** about lighting‘s invisible benefits, such as contributions to human performance, well-being and energy and cost savings;
    - Intervention Opportunity: Provide education and training to retailers and distributors so they are armed with improved selling information and enhanced selling techniques
        i. Intended Results: improve the AKA of lighting retailers and distributors concerning both energy and non-energy benefits of EE lighting measures.

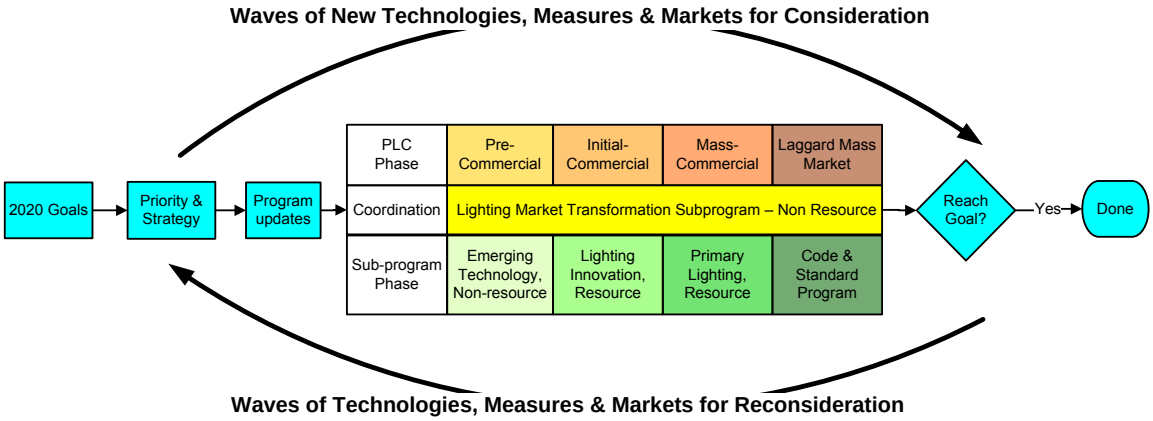
- **Cost** constraints, including the challenge of encouraging end users to purchase and install best practice lighting technologies and systems;
    - Intervention Opportunity: Provide an incentive to new and innovative lighting product where IOU intervention would accelerate the movement of product life cycle
        i. Intended Results: reduced prices for the targeted lighting products, leading to increasing purchase and installation of the program target measures.

Over time, the program can help reduce product costs, increase retailer shelf space, and variety of program qualified products. These effects will contribute to changes in the lighting market dynamic leading to lasting market change.

- **Gaps in the Research, Development and Demonstration (RD&D) infrastructure** that cause redundancies and unnecessary delays in rapid deployment of best practice technologies to the market.
    - Intervention Opportunity: Work with manufacturers to encourage the development of better energy saving products. Sample, test and verify lighting technology to reduce performance uncertainty
        i. Intended Results: Reduce performance and market uncertainty of new lighting measures and practices. This information could be used to improve programmatic design so program delivery mechanism could be more effective in reaching target customers and markets.

v. A coherent program, or "market," logic model that ensures a solid causal relationship between the proposed intervention(s) and its/their intended results[4];

The Statewide Lighting programs are designed to use a market transformation framework to pull in new measures and technologies and to re-strategize the more mature measures and technologies. The diagram below describes this iterative process.




[4] If this logic model is the same as that requested in #10.(O), only provide once. As needed, provide a more detailed logic model emphasizing the market transformation elements of the program and/or how such elements integrate with resource acquisition elements.

Within this context, an IOU Decision Panel is formed, to manage and guide this process. The sub-program logic models will illustrate the interaction amongst the Lighting Market Transformation sub-program, Lighting Innovation sub-program and Primary Lighting sub-program.

vi. Appropriate evaluation plans and corresponding Market Transformation indicators and Program Performance Metrics based on the program logic model.

Due to the need to comply with the Decision's timeline for filing the 2013-2014 PIP, and our desire to comply with earlier Decisions that call for gathering stakeholder input in informing market transformation efforts, we suggest that a full market effects evaluation plan be developed during the formulation of the Joint EM&V Plan as described in section "18.1. Evaluation Budget" in Decision R.09-11-014. Until then, we suggest the following approach.

Summative evaluation: Market Effects. The market transformation program's theory and logic model will be used to guide the evaluation efforts. The scope of the market effects study should be defined by the MT program's scope. The timeline for specific market effects that are to be evaluated should be defined by the MT program theory. Among other indicators, the program theory may specify changes in market characteristics that can be evaluated, such as 1) spillover, 2) attitudes, awareness and knowledge, 3) reductions in a specific market barrier, 4) current pricing and product availability, and 5) other market milestones. We will make the following distinction between program "spillover" and market effects: spillover is energy savings not directly tracked by the program, whereas market effects are broader and would include spillover as well as meaningful changes in the structure or functioning of the market.

Formative evaluation. The formative evaluation of a market transformation program is typically performed at the intervention (i.e. program) level. The methods are the same as would be used in a program process evaluation, and would include interviews with program staff, participants and non-participants as well as an assessment of the program's direct outputs.

Market transformation indicator results shall be reported, as available, by Energy Division or the IOUs, depending upon who conducts the necessary market studies. (Res. 4385, 12/2/10)

Attribution. Outside of California, most guidelines for evaluating market transformation acknowledge that it is very difficult to attribute market effects to any single program, and nearly impossible to partition out the

respective contributions of several coordinated programs on market effects and market transformation. In California, the Framework (Sebold et al., 2001) emphasized that attribution of market effects to programs bears further research. Others (Rosenberg & Hoefgen, 2009; Keating & Prahl (MT Workshop, Nov 2011) suggest that declaring the program's strategic intent through the market transformation initiative's theory and logic model is key to establishing future claim on transformation effects. The methods proposed by Rosenberg & Hoefgen (2009) for attributing market effects to individual programs include a number of approaches, all of them qualitative: self-report of spillover and free ridership; cross-sectional comparisons with other geographic regions; structured expert judging; and case studies. But attribution using a "preponderance of evidence" approach would likely be expensive and still yield arguable results. Attribution by nature focuses on individual program efforts, and we believe the market transformation evaluation discourse should be focused on the overlapping synergy among all programs and influences in the market. We realize we all have a "Shared Mission" of meeting the CPUC's very aggressive Strategic Plan goals. We do not wish to not invest resources in teasing apart which program entity contributed how much, but instead will plan to focus on whether all the market forces across the State of California have succeeded in transforming the market.

**11) Additional information as required by Commission decision or ruling or as needed:**

## ATTACHMENT 1

**Program Non-Energy Objectives**

For New or Substantially changed programs and sub-programs, provide the following information for Program Non-Energy Objectives and follow the format used for the previous cycle Program Performance Metrics found in Resolution E-4385.

i. List the primary SMART[5] non-energy objectives of the program.

ii. For each SMART objective, identify the quantitative targets, direction or percent of change that you hope to achieve during the program cycle.[6] .

iii. For each proposed SMART objective, describe any relevant baseline data on current market conditions that you have assembled or plan to assemble and the sources.

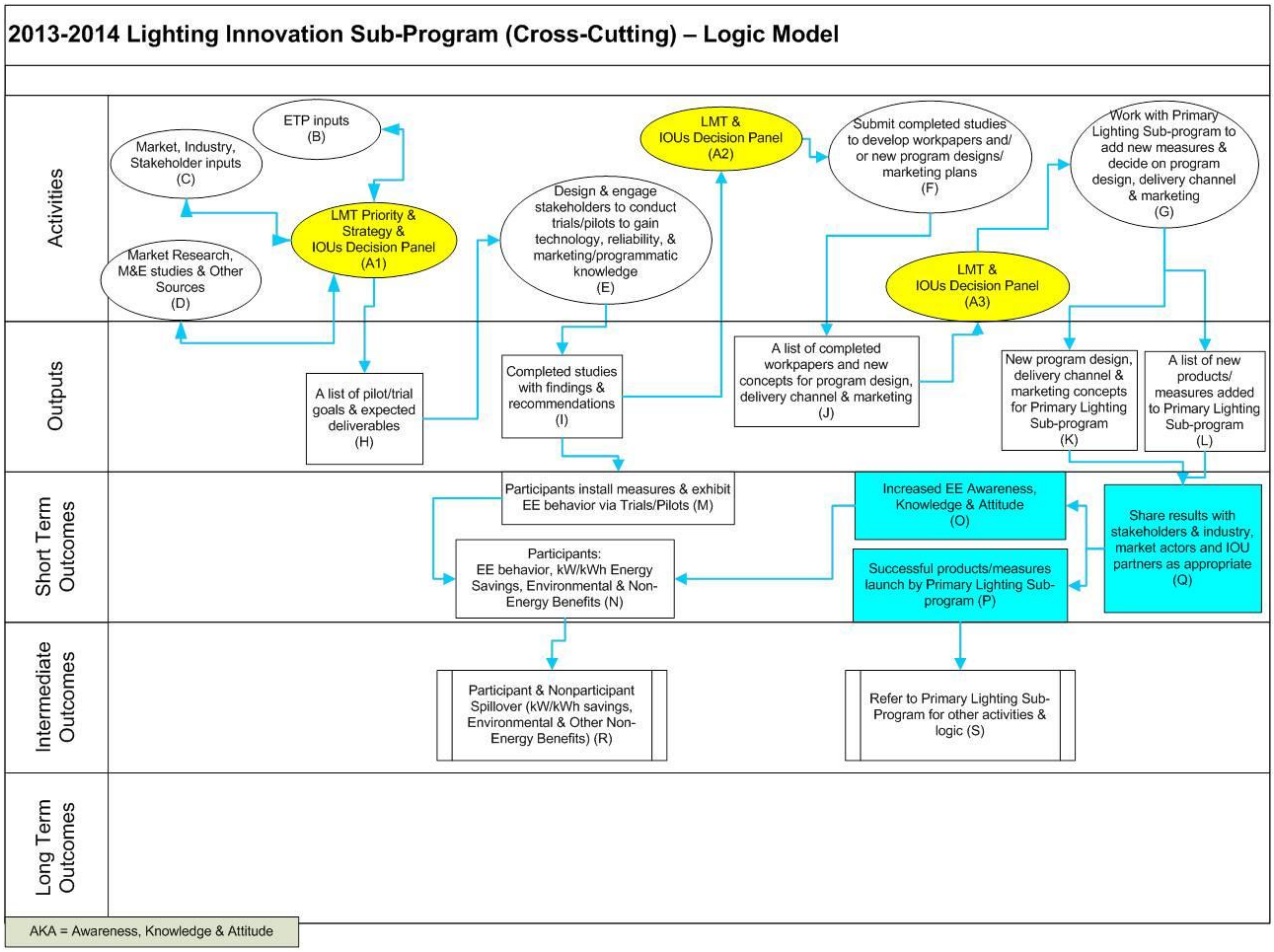
**iv. Quantitative program targets (PPMs):**

**Table 3. Quantitative Program Targets (PPMs)**

[5] A SMART objective is one that is **S**pecific (i.e. quantitative and quantifiable generally, in terms of the results to be achieved**), M**easurable, **A**mbitious, **R**ealistic, and **T**ime-bound.

[6] Please also add any new program objectives and quantitative targets for statewide programs to the portfolio PPM/MTI reporting template.

# ATTACHMENT 2



## ATTACHMENT 3

### Table 1: Projected Sub-Program Budget, by Calendar Year

| | Program Year | | |
|---|---|---|---|
| **Lighting Innovation** | **2013** | **2014** | **Total** |
| Admin ($) | | | |
| General overhead ($) | | | |
| Incentives ($) | | | |
| Direct Install Non-Incentives ($) | | | |
| Marketing & Outreach ($) | | | |
| Education & Training | | | |
| Total Budget | | | |

Individual utility specific information to be provided in this table

### Table 2: Projected Sub-Program Net Energy and Demand Impacts, by Calendar Year

| | Program Years | | |
|---|---|---|---|
| | **2013** | **2014** | **Total** |
| **Lighting Innovation** | | | |
| GWh | | | |
| Peak MW | | | |
| Therms (millions) | | | |

Individual utility specific information to be provided in this table

### Table 3: Quantitative Program Targets (PPMs)

| Lighting Innovation PPM | Program Performance Metric (New) | Metric Type |
|---|---|---|
| | | |
| | | |
| | | |

### Table 4: Work paper Status

| # | Workpaper Number/Measure Name | Approved | Pending Approval | Submitted but Awaiting Review |
|---|---|---|---|---|
| 1 | Work paper group will provide this information when it is available | | x | |
| 2 | | | x | |
| 3 | | | x | |
| 4 | | | x | |
| 5 | | | x | |
| 6 | | | x | |

**Table 5: Sub-Program Milestones and Timeline**

| Milestone - Web Trial | Date |
|---|---|
| Project Initiation Meeting | 1/15/2013 |
| Vendor Solicitation | 2/15/2013 |
| Agreements Completed | 3/15/2013 |
| Release Allocations | 4/1/2013 |
| Launch Web Trial | 5/1/2013 |
| Trial Period Ends | 12/15/2014 |
| Trial Results Report Out | 4/15/2015 |

| Milestone - Midstream | Date |
|---|---|
| Project Initiation Meeting | 1/15/2013 |
| Vendor Solicitation | 2/15/2013 |
| Agreements Completed | 3/15/2013 |
| Release Allocations | 4/1/2013 |
| Launch Midstream Trial | 5/1/2013 |
| Trial Period Ends | 12/15/2014 |
| Trial Results Report Out | 4/15/2015 |

| Milestone - Sustainable Office Lighting | Date |
|---|---|
| Project Initiation Meeting | 1/15/2013 |
| Vendor Solicitation | 2/15/2013 |
| Agreements Completed | 3/15/2013 |
| Release Allocations | 4/1/2013 |
| Launch Sustainable Office Lighting | 5/1/2013 |
| Trial Period Ends | 12/15/2014 |
| Trial Results Report Out | 4/15/2015 |

| Milestone - Demonstration Projects | Date |
|---|---|
| Project Initiation Meeting | 1/15/2013 |
| Vendor Solicitation | 2/15/2013 |
| Planning and Coordination | 3/15/2013 |
| Agreements Completed | 3/15/2013 |
| Deploy Demonstration Projects | 5/15/2013 |
| Demonstration Projects End | 2/15/2014 |
| Annual Report Out | 3/15/2014, 3/15/2015 |

**Table 6: Geographic Regions**

| Geographic Region | [Insert Program/Sub-Program Name] |
|---|---|
| CEC Climate Zone 1 | |
| CEC Climate Zone 2 | |
| CEC Climate Zone 3 | |
| CEC Climate Zone 4 | |
| CEC Climate Zone 5 | |
| CEC Climate Zone 6 | Lighting Innovation |
| CEC Climate Zone 7 | |
| CEC Climate Zone 8 | Lighting Innovation |
| CEC Climate Zone 9 | Lighting Innovation |
| CEC Climate Zone 10 | Lighting Innovation |
| CEC Climate Zone 11 | |
| CEC Climate Zone 12 | |
| CEC Climate Zone 13 | Lighting Innovation |
| CEC Climate Zone 14 | |
| CEC Climate Zone 15 | Lighting Innovation |
| CEC Climate Zone 16 | Lighting Innovation |
| System | Lighting Innovation |

**Table 7: Program Administration of Program Components**

| Program Name | Program Component | Implemented by IOU Staff? (X = Yes) | Implemented by contractors to be selected by competitive bid process (if Yes then enter type of contractor/other market actor possibly used) | Implemented by contractors NOT selected by competitive bid process (list prime contractor and sub-contractor names) | Implemented by local government or other entity ( X = Yes) |
|---|---|---|---|---|---|
| Lighting Innovation | Web Trial | X | | | |
| Lighting Innovation | Midstream | X | | | |
| Lighting Innovation | Sustainable Office Lighting | X | | | |
| Lighting Innovation | Demonstration Projects | X | Lighting Contractor | | |
| Lighting Innovation | Other Program Delivery Models | X | Contractor | | |

**Table 8: Customer Eligibility Requirements (Joint Utility Table)**
Refer to Primary Lighting Table 8

The utilities must work together and submit this table jointly in their respective applications

**Table 9: Contractor Eligibility Requirements (Joint Utility Table)**

| **Contractor Eligibility Requirement (list of requirements)** | **PGE** | **SCE** | **SDGE** | **SCG** |
|---|---|---|---|---|
| Signed Participation Agreement | x | x | x | |
| Completed Reservation Request | x | x | x | |
| Signed Notification of Allocation Form | x | x | x | |
| Confirmation of Allocation Received from IOU | x | x | x | |
| ENERGY STAR®/DLC listed if products are applicable to listing | x | x | x | |
| Proven business entity validity, established clientele | x | x | x | |
| Demonstrated track record | | x | TBD | |
| Financial ability to indemnify IOU | | x | TBD | |
| Competence demonstrated in the application process | | x | x | |

List any contractor (and/or developer, manufacturer, retailer or other "participant") eligibility requirements (e.g. specific IOU required trainings; specific contractor accreditations; and/or, specific technician certifications required).
The utilities must work together and submit this table jointly in their respective applications

**Table 10: Manufacturer/Retailer/Distributor Partners**

| **Manufacturer/Retailer/Distributor Partner Information** | **PGE** | **SCE** | **SDGE** | **SCG** |
|---|---|---|---|---|
| | [list kinds of manufacturers] | [list kinds of manufacturers] | [list kinds of manufacturers] | [list kinds of manufacturers] |
| Manufacturers enrolled in program | CFL | CFL | CFL | |
| Manufacturers enrolled in program | LED | LED | LED | |
| Manufacturers enrolled in program | Fixtures | Fixtures | Fixtures | |
| Manufacturers enrolled in program | Controls | Controls | Controls | |
| Manufacturers enrolled in program | HID | HID | HID | |
| Manufacturers enrolled in program | Linear Fluorescent | Linear Fluorescent | Linear Fluorescent | |
| Manufacturers enrolled in program | Induction | Induction | Induction | |

| | | | | |
|---|---|---|---|---|
| Manufacturers enrolled in program | Cold Cathode | Cold Cathode | Cold Cathode | |
| Manufacturers enrolled in program | Other (eg. Plasma, OLED) | Other (eg. Plasma, OLED) | Other (eg. Plasma, OLED) | |
| Manufacturers targeted for enrollment in program | CFL | CFL | CFL | |
| Manufacturers targeted for enrollment in program | LED | LED | LED | |
| Manufacturers targeted for enrollment in program | Fixtures | Fixtures | Fixtures | |
| Manufacturers targeted for enrollment in program | Controls | Controls | Controls | |
| Manufacturers targeted for enrollment in program | HID | HID | HID | |
| Manufacturers targeted for enrollment in program | Linear Fluorescent | Linear Fluorescent | Linear Fluorescent | |
| Manufacturers targeted for enrollment in program | Induction | Induction | Induction | |
| Manufacturers targeted for enrollment in program | Cold Cathode | Cold Cathode | Cold Cathode | |
| Manufacturers targeted for enrollment in program | Other (eg. Plasma, OLED) | Other (eg. Plasma, OLED) | Other (eg. Plasma, OLED) | |
| Retailers enrolled in program | Discount | Discount | Discount | |
| Retailers enrolled in program | Drug | Drug | Drug | |
| Retailers enrolled in program | Grocery | Grocery | Grocery | |
| Retailers enrolled in program | Hardware | Hardware | Hardware | |
| Retailers enrolled in program | Home Improvement | Home Improvement | Home Improvement | |
| Retailers enrolled in program | Ltg & Electronics | Ltg & Electronics | Ltg & Electronics | |
| Retailers enrolled in program | Mass Merchandise | Mass Merchandise | Mass Merchandise | |
| Retailers enrolled in program | Membership Club | Membership Club | Membership Club | |
| Retailers enrolled in program | Large Supermarket | Large Supermarket | Large Supermarket | |
| Retailers enrolled in program | Other | Other | Other | |
| Retailers targeted for enrollment in program | Discount | Discount | Discount | |
| Retailers targeted for enrollment in program | Drug | Drug | Drug | |
| Retailers targeted for enrollment in program | Grocery | Grocery | Grocery | |
| Retailers targeted for enrollment in program | Hardware | Hardware | Hardware | |
| Retailers targeted for enrollment in program | Home Improvement | Home Improvement | Home Improvement | |
| Retailers targeted for enrollment in program | Ltg & Electronics | Ltg & Electronics | Ltg & Electronics | |
| Retailers targeted for enrollment in program | Mass Merchandise | Mass Merchandise | Mass Merchandise | |
| Retailers targeted for enrollment in program | Membership Club | Membership Club | Membership Club | |
| Retailers targeted for enrollment | Large | Large | Large | |

| | | | | |
|---|---|---|---|---|
| in program | Supermarket | Supermarket | Supermarket | |
| Retailers targeted for enrollment in program | Other | Other | Other | |
| Distributors enrolled in program | Contractors | Contractors | Contractors | |
| Distributors enrolled in program | Electrical Wholesale | Electrical Wholesale | Electrical Wholesale | |
| Distributors targeted for enrollment in program | Lighting Wholesale | Lighting Wholesale | Lighting Wholesale | |
| Distributors targeted for enrollment in program | Electrical Wholesale | Electrical Wholesale | Electrical Wholesale | |
| Distributors targeted for enrollment in program | Contractors | Contractors | Contractors | |
| Distributors targeted for enrollment in program | ESCOs | ESCOs | ESCOs | |

**Table 11: Summary Table of Measures, Incentive Levels and Verification Rates**

Refer to Table 11 in the Primary Lighting Program

**Table 12: Additional Services**

| **Additional Services that the Sub-Program Will Provide** | **To Which Market Actors** | **PGE** | **SCE** | **SDGE** | **SCG** |
|---|---|---|---|---|---|
| | | [indicate the level at which the service will be incented or funded] | [indicate the level at which the service will be incented or funded] | [indicate the level at which the service will be incented or funded] | [indicate the level at which the service will be incented or funded] |
| Orientation and Training | Upstream and Midstream Participants | TBD | No Charge, Normal Operations | No funding required | |
| Promotional and Educational materials | Upstream and Midstream Participants | TBD | No Charge, Normal Operations | No funding required | |
| Orientation and Training for Trial Study Purposes | New Delivery Channel Partners, End-Users | | No Charge, Normal Operations | | |
| Promotional and Educational materials for Trial Study Purposes | New Delivery Channel Partners, End-Users | | No Charge, Normal Operations | | |
| Education and Training on lighting technologies, systems, and design strategies | Lighting Designers, Architects Engineers | | No Charge, Normal Operations | | |
| Education and Training on lighting technologies, systems, and design strategies | Contractors & Installers | | No Charge, Normal Operations | | |

For each service provided, indicate any expected charges to market actors of the services, and/or the level at which any such services will be incented or funded.

**Table 13: Program Related Audits**

| Levels at Which Program Related Audits Are Rebated or Funded | Who Receives the Rebate/Funding (Customer or Contractor) |
|---|---|
| Lighting Innovation does not have any plans to fund or rebate audits | |

NOTE: If software tools are required sub-program participation, and if there is a program related audit for the sub-program, this table shows the levels at which the audit is rebated or funded and to whom such rebates/funding will be provided (i.e., customer or contractor)

**Table 14: Quality Assurance Provisions**

Refer to Primary Lighting QA Provisions

NOTE: Please list quality assurance, quality control, including accreditations/certification or other credentials required.

**Table 15: Cross-cutting Sub-program and Non-IOU Partner Coordination**

| Sub-Program Name | | |
|---|---|---|
| **Other IOU Sub-program Name** | **Coordination Mechanism** | **Expected Frequency** |
| Lighting Market Transformation | Individual or Group Meetings and Email | Weekly |
| Multi-Family | Individual Meetings | As needed, roughly monthly |
| Deemed & Calculated Nonresidential | Individual or Group Meetings and Email | As needed, roughly monthly |
| Emerging Technologies | Individual or Group Meetings and Email | As needed, roughly quarterly |
| 3rd Party & Direct Install | Individual or Group Meetings and Email | As needed, roughly quarterly |
| Codes & Standards | Individual Calls or Meetings | As needed, roughly twice annually |
| Coordination Partners Outside CPUC | | |
| ENERGY STAR | Group Meetings, Calls and Email | Twice annually |
| CEE | Group Meetings, Calls and Email | Three times annually |
| Major Retailers | Group Meetings or Group Calls | As needed, roughly twice yearly |
| DOE | Team Conference Calls | Roughly Quarterly |
| CEC | Group Meetings | Roughly Annually |

Note: "Mechanisms" refers to communication methods (i.e. quarterly meetings; internal list serves; monthly calls, etc.) and/or any cross-program review methods (i.e., feedback on program plans; sign off on policies, etc). or harmonization techniques (i.e. consistent certification requirements across programs, program participant required cross trainings, etc).

**Table 16: Non-EE Sub-Program Information**

| **Sub-Program Name** | | |
|---|---|---|
| **Non-EE Sub-Program** | **Budget** | **Rationale and General Approach for Integrating Across Resource Types** |
| Not Applicable to Lighting Innovation | | |

NOTE: Column C --> Integrated/coordinated Demand Side Management: As applicable, describe how sub-program will promote customer education and sub-program participation across all DSM options. Provide budget information of non-EE sub-programs where applicable. Column D --> Integration across resource types (energy, water, air quality, etc): If sub-program aims to integrate across resources types, please provide rationale and general approach

1) **Sub-Program Name:** Primary Lighting
2) **Sub-Program ID number:** SDG&E
3) **Type of Sub-Program: _✓_Core __Third Party __Partnership**
4) **Market sector or segment that this sub-program is designed to serve:**

    a. _✓_ Residential
        i. Including Low Income? _✓_ Yes __ No
        ii. Including Moderate Income? _✓_ Yes __ No
        iii. Including or specifically Multifamily buildings _✓_ Yes __ No
        iv. Including or specifically Rental units? ✓__ Yes __ No
    b. _✓_ Commercial (List applicable NAIC codes: _____)
    c. _✓_ Industrial (List applicable NAIC codes: _____)
    d. _✓_ Agricultural (List applicable NAIC codes: _____)

5) **Is this sub-program primarily a:**
    a. Non-resource program ___ Yes_✓_ No
    b. Resource acquisition program _✓__ Yes ___ No
    c. Market Transformation Program ___ Yes _✓__ No

6) **Indicate the primary intervention strategies:**

    a. Upstream _✓__ Yes ___ No
    b. Midstream _✓__ Yes ___ No
    c. Downstream _✓__ Yes ___ No
    d. Direct Install _✓_ Yes __ No
    e. Non Resource _✓_ Yes __ No

7) **Projected Sub-program Total Resource Cost (TRC) and Program Administrator Cost (PAC):** TRC ___ PAC ___

8) **Projected Sub-Program Budget:**

**Table 1. Projected Sub-Program Budget, by Calendar Year:**

| | Program Year | | |
|---|---|---|---|
| **Sub-Program** | **2013** | **2014** | **Total** |
| Admin ($) | | | |
| General overhead ($) | | | |
| Incentives ($) | | | |
| Direct Install Non-Incentives ($) | | | |
| Marketing & Outreach ($) | | | |
| Education & Training | Included in M&O above | Included in M&O above | Included in M&O above |
| Total Budget | | | |

**9) Sub-Program Description, Objectives and Theory:**

**a) Sub-Program Description and Theory:**

The Primary Lighting Sub-program is the largest component of the Statewide Lighting Program. This sub-program administers incentive offers for energy efficient lighting measures to the customer base at large. This sub-program will work in-conjunction with lighting ETP activities, Lighting Innovation and Lighting Market Transformation Programs to maintain a portfolio of high quality lighting measures that includes existing and new technologies.

The program serves the needs of all customer sectors, in both residential and nonresidential areas, and reports results together. In years past, commercial, industrial, and agricultural lighting performance was reported primarily under the Commercial Energy Efficiency Program, and residential lighting performance under the Residential Energy Efficiency Program.

This program will employ multiple delivery strategies, including upstream, midstream, and downstream offers. Upstream offers use manufacturers to apply incentives that get passed on to customers; midstream offers use distributors, retailers, or contractors; downstream offers provide incentives directly to the end-use customer. Primary Lighting will be a resource program, which will also have non-resource, and market transformation activities and emphases.

Program operations will preserve best practices used in the past and apply the IOUs' value of continuous improvement. The offers contained in this program have been important parts of utility EE portfolios for many years and have been successful in making inroads toward the market development of efficient lighting in California. The program has been highly cost-effective each year.

**b) Sub-Program Energy and Demand Objectives-**

**Table 2. Projected Sub-Program Net Energy and Demand Impacts, by Calendar Year**

| | Program Years | | |
|---|---|---|---|
| | **2013** | **2014** | **Total** |
| **Sub-program Name** | | | |
| GWh | | | |
| Peak MW | | | |
| Therms (millions) | | | |

**c) Program Non-Energy Objectives**:

During the transition period the IOUs will pursue the following non-energy objectives:

The program will strategically coordinate the transitions between product market stage, code requirements, and market potential to optimize stakeholder value. The

program will do this in concert with other lighting sub programs. This will result in product type and sector mixes indicative of such coordination.

Education by means of customer outreach will address barriers of awareness and knowledge. Marketing plans will be written and implemented each year with this goal in mind.

The program will work to further the development of better energy efficient technologies and products. Products with characteristics that indicate technological newness, improvement, or better marketability will be promoted when market ready and cost-effective. Long term technology improvement and adoption will take place in conjunction with other sub programs.

The IOUs will address infrastructure, policy, and protocol barriers with the objective of implementing widely acceptable short and mid-term solutions.

**d) Cost Effectiveness/Market Need**:

**e) Measure Savings/ Work Papers**:
Work papers will be used. Where DEER values or methodologies are found applicable, they will be incorporated in the work papers.

a. Indicate data source for savings estimates for program measures (DEER, custom measures, etc).

b. Indicate work paper status for program measures:

**Table 4: Work paper Status**

See Attachment 3

**10) Program Implementation Details**

**a) Timelines:**

**Table 5: Sub-Program Milestones and Timeline**

**b) Geographic Scope**:
**Table 6: Geographic Regions Where the Program Will Operate**

See Attachment 3

**c) Program Administration**

**Table 7: Program Administration of Program Components**

See Attachment 3

**d) Program Eligibility Requirements:**

**i. Customers:**

**Table 8: Customer Eligibility Requirements**

See Attachment 3

**ii. Contractors/Participants:**

**Table 9: Contractor/Participant Eligibility Requirements (Joint Utility Table)**

See Attachment 3

**e) Program Partners:**

**a. Manufacturer/Retailer/Distributor partners:**

The number of participating lighting manufacturers and outlets changes each year as some new participants are added, and some choose not to participate. See Table 9 for a list of prospective program partner descriptions based on past participants.

**Table 10: Manufacturer/Retailer/Distributor Partners**

**b. Other key program partners**:

**f) Measures and incentive levels**:

Measures in this program are for energy efficient lighting products, such as CFLs, specialty CFLs, and dimmable linear fluorescent ballasts, HID fixtures, fluorescent fixtures, induction fixtures, lighting controls, plug-in lamps, and newer technologies, in the mass commercialization phase. Planned measures and incentive levels are shown in summary form in Table 10, along with associated market actors. In that table Incentive ranges indicate multiple tiers or lumen ranges with different maximum incentives.

The table envisions all currently known measures. The program allows for the introduction of new measures during the implementation period as they become ready. Each IOU could choose a different subset of the measure list.

Some measures might be retired due to issues such as code changes. For example, dimmable linear fluorescent ballasts will be offered in 2013, but discontinued thereafter due to the anticipated code change. Other measures could be moved to another sub-program for further development. Some measures face barriers that could reduce their market penetration compared to previous years.

Each IOU may move measures from one lighting sub-program to another during the implementation period at their individual discretion. Some products traditionally

delivered through one entry point in the delivery stream (up, mid, or down), may be offered through another. This can also vary by utility.

A California standard for LED products will be developed for use in this program. The IOUs will provide rebates for products that meet the standard. Where the CEC quality standard for LEDs does not apply, LED products must be consistent with ENERGY STAR or Design Lights Consortium (DLC) standards and bear the Lighting Facts label. In addition, medium screw based LEDs are required to appear on the DOE Lighting Facts list to be eligible.

**Table 11: Summary Table of Measures, Incentive Levels and Verification Rates**

See Attachment 3

a. Indicate the expected incentive level by measure or measure grouping.
b. For each incented or rebated measure, indicate the market actor to whom this will be provided.

**g) Additional Services:**

a. For each service provided, indicate any expected charges to market actors of the services, and/or the level at which any such services will be incented or funded.

**Table 12: Additional Services**

See Attachment 3

**h) Sub-Program Specific Marketing and Outreach:**

The IOUs support educational and promotional efforts to enhance the public's understanding of energy efficient lighting and its positive impact for their quality of life. This theme was proposed in the Strategic Plan. The IOUs prepare individual marketing and education plans, but collaborate on messages and strategies. Each designs its materials and efforts separately in keeping with its corporate standards.

Depending on the utility, plans can include tactics such as issuing bill inserts, hosting promotional web pages, and conducting outreach efforts. Special events with displays and signs can disseminate printed materials and answer customer questions. Events sometimes include demonstrations of energy saving products. Multi-program brochures and other ways of integrating program messages are common. Fact sheets on lighting, mercury, CFL disposal, and other relevant educational topics are common in the marketing plan.

In marketing and outreach, the IOUs go to great lengths to promote messages that the CPUC has asked for or directed. A central message encourages customers not to wait for incandescent bulbs to burn out before installing energy efficient lighting. Other

important messaging educates customers on the variety of specialty and advanced lighting products. Environmental messaging is promoted, covering topics such as the proper disposal of spent lighting products containing mercury.

For the upstream offer, the most successful marketing involves in-store signage and displays. IOUs specify criteria and educational messages for manufacturers to construct eye-catching displays and signage. The program solicits participants to apply some form of additional promotional effort, such as end caps or circulars. In-store promotion demonstrates its effectiveness year after year through expansive sales.

**i) Sub-Program Specific Training:**

i. Training through program materials designed for each type of participant
ii. Training manufacturers participating in upstream and midstream offers on requesting fund reservations, submitting invoice packets, and using IOU-provided electronic tools and systems
iii. Training retailers, distributors, or contractors in program participation and implementation
iv. Training IOU employees in program operations

**j) Sub-Program Software and/or Additional Tools:**

a. List all eligible software or similar tools required for sub-program participation.

Online systems offered by the IOU
Email
MS Excel
MS Word

b. Indicate if pre and/or post implementation audits will be required for the sub-program.
Pre-implementation audit required X Yes ___ No
Post-implementation audit required X Yes ___ No

c. As applicable, indicate levels at which such audits shall be rebated or funded, and to whom such rebates/funding will be provided (i.e. to customer or contractor).

**Table 13: Post-implementation Audits**

See Attachment 3

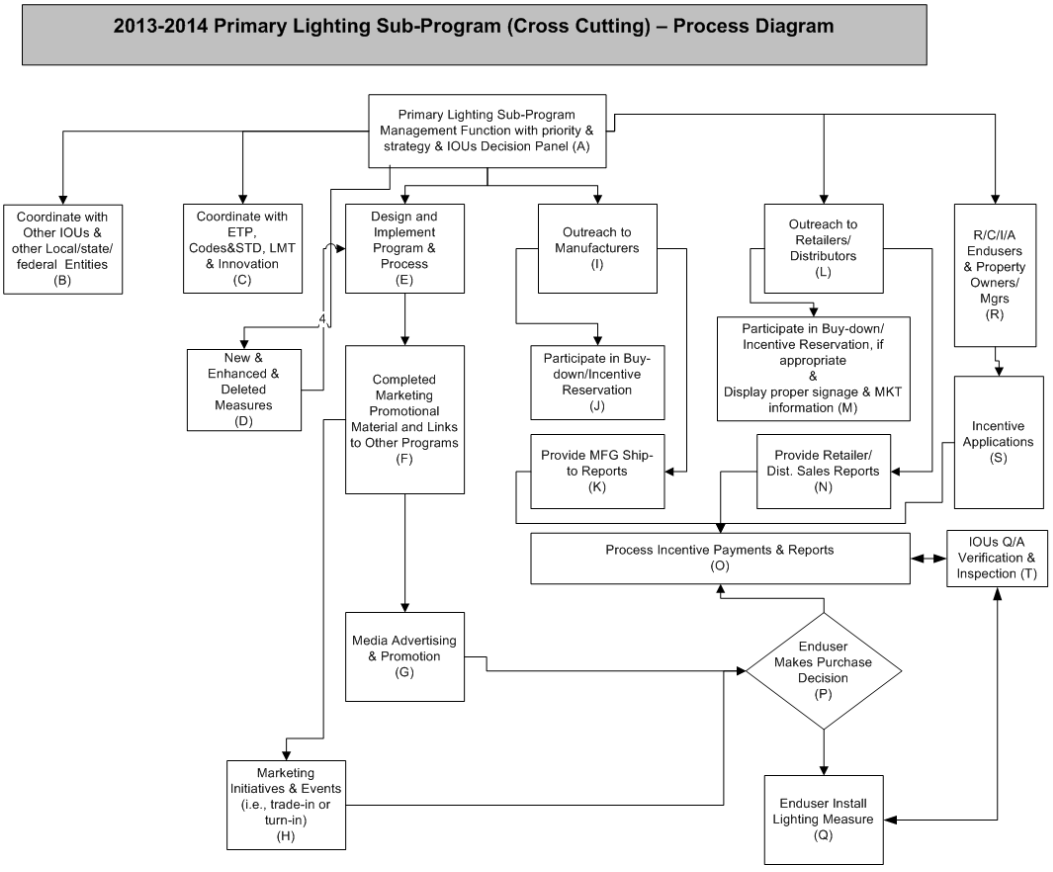
**k) Sub-Program Quality Assurance Provisions:**
**Table 14: Quality Assurance Provisions**

See Attachment 3

**l) Sub-program Delivery Method and Measure Installation /Marketing or Training:**

The use of participating installation contractor will be used for multi-family offers. The direct-install method will be used for small commercial lighting retrofits above code requirements. Downstream rebates will be employed for deemed and calculated lighting measures. Program implementers will be used for offers in the third party category. Midstream incentives are an alternative approach for nonresidential lighting measures applicable to distributor participation. The upstream manufacturer reimbursement method for retail incentive discounts will be used for the residential lighting offer. The retailer-midstream delivery method is similar to the upstream method, but the incentive reimbursement check is paid to the retailer instead of the manufacturer. Any other delivery methods proceeding from the Lighting Innovation Program may also be used.

**m) Sub-program Process Flow Chart:**




**n) Cross-cutting Sub-program and Non-IOU Partner Coordination:**

Other IOU programs coordinating most closely and frequently with this sub-program are the other sub-programs within Statewide Lighting. This program must also

coordinate closely with other rebate programs. It coordinates less frequently with Emerging Technologies and Codes & Standards.

Key non-IOU partners include ENERGY STAR®, Consortium for Energy Efficiency (CEE), the California Lighting Technology Center (CLTC), lighting manufacturers, and major retailers. The program interacts with many other entities, but not as frequently, such as the Natural Resources Defense Council (NRDC), the Department of Energy (DOE), Design Lights Consortium (DLC), the California Energy Commission (CEC) and the CPUC.

**Table 15: Cross-cutting Sub-program and Non-IOU Partner Coordination**

**o) Logic Model:**

See Attachment 2

When the LMT sub-program has made decisions based on experiences with new products in the Innovation sub-program, including submitting completed studies and workpapers that a new product is to be entered into the Primary Lighting sub-program, program designs are created to introduce the product to the production program. The major activities in the Primary Lighting sub-program logic model involve advertising, direct mailing, and coordination with home and business Energy Advisor Survey activities, engaging manufacturers, engaging retailers and distributors, engaging end users with deemed, calculated and direct install activities, engaging property owners/managers via contractors and working with others—professional and trade organizations—to engage contractors, architects, engineers. All of these activities lead toward participant and non-participant purchases of the new product, thus overcoming barriers to those purchases, and further reducing barriers to future purchases (spillover).

**11) Additional Sub-Program Information**

**a) Advancing Strategic Plan Goals and Objectives**:

The Strategic Plan Goals and Objectives are aimed at removing a number of program and market barriers:

1. Policy barriers
2. Lack of knowledge
3. Proprietary protocols
4. Lack of retailer and consumer awareness
5. Cost constraints
6. Gaps in Research, Development and Demonstration

The program is designed to overcome the barriers stated above through:

- Education and marketing that helps create positive consumer awareness and counter objections with clear messaging
- Incentives to reduce the initial cost barrier;
- Interaction with policy makers to work through policy barriers

- Working with other sub programs and directly with manufacturers to influence improvement and development of products.

The delivery methods for this program were designed for the purpose of countering market and program barriers and to maximize energy savings. The various methods are matched to specific target customer characteristics to achieve these ends. See the section on Market Transformation Information below for a more detail.

**b) Integration**

**i. Integrated/coordinated Demand Side Management**:

The lighting program measures are often promoted alongside demand response offers as an Integrated DSM (IDSM) strategy through the IOU's customer contact people. Promising measures conducive to demand response such as lighting controls with remote capabilities, can also contribute to IDSM.

Although this sub-program does not fund IDSM activities through its budget, it supports the demand side management emphases through outcomes such as peak shaving, load shifting, valley filling, and load curtailment, which are the results of energy efficient lighting and controls.

**Table 16: Non-EE Sub-Program Information**

See Attachment 3

**ii. Integration across resource**.

This program does not aim to integrate across resources types because lighting is not currently conducive to such activities.

**c) Leveraging of Resources**:

Primary Lighting will not leverage external investments, but will leverage value provided by program participants at no cost, such as in-store displays and advertising.

**d) Trials/ Pilots:**

No formal trials or pilots will be conducted in this sub-program. These activities will occur in other lighting sub programs.

**e) Knowledge Transfer:**

Best practices are shared at inter-utility meetings, such as the CEE Lighting Committee meetings, ENERGY STAR Partner meetings, and the DOE's CALiPER meetings. Additionally, best practice studies can be found on the Best Practices web site at eebestpractices.com

**12) Market Transformation Information**:

i. A summary of the market transformation objectives of the program.

The objective of the Primary Lighting program is to accelerate the adoption of new and innovative lighting measures, to aggressively promote existing effective measures, and to prune matured lighting measures with reduced potential to meet program objectives. This program is designed to do the following:

(1) Be part of the solution to support the goals of the California Long-term Energy Efficiency Strategy and the goals identified in the Lighting Chapter (i.e., chapter 13).

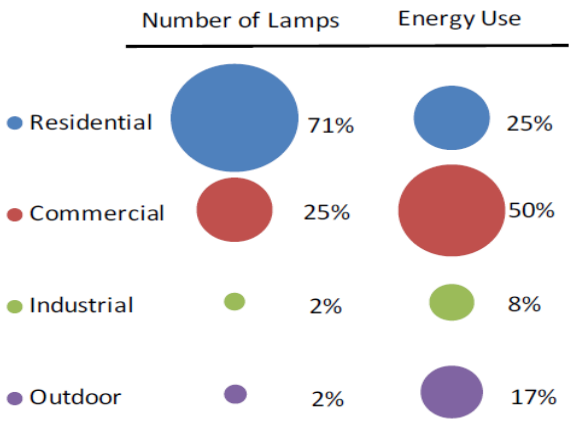
(2) Develop specific program intervention strategies to overcome market barriers and to meet IOUs' energy savings objectives.

(3) Implement a rigorous process so this program will be seeking for advanced technologies, measures and markets to meet the wants/needs of customer sectors and fulfill policy directions.

ii. A description of the market, including identification of the relevant market actors and the relationships among them;

The lighting market dynamic is complex and many market actors are involved depending on the customer segments: (1) Residential and (2) Non-Residential. Residential usage accounts for 71% of the lamps by quantity but only 25% of lighting energy consumption. If outdoor lighting applications were set aside, commercial and industrial lighting would account for 27% of lamp quantities and 58% of lighting energy consumptions.

Number of Lamps and Lighting Energy Consumption in the U.S., by Sector



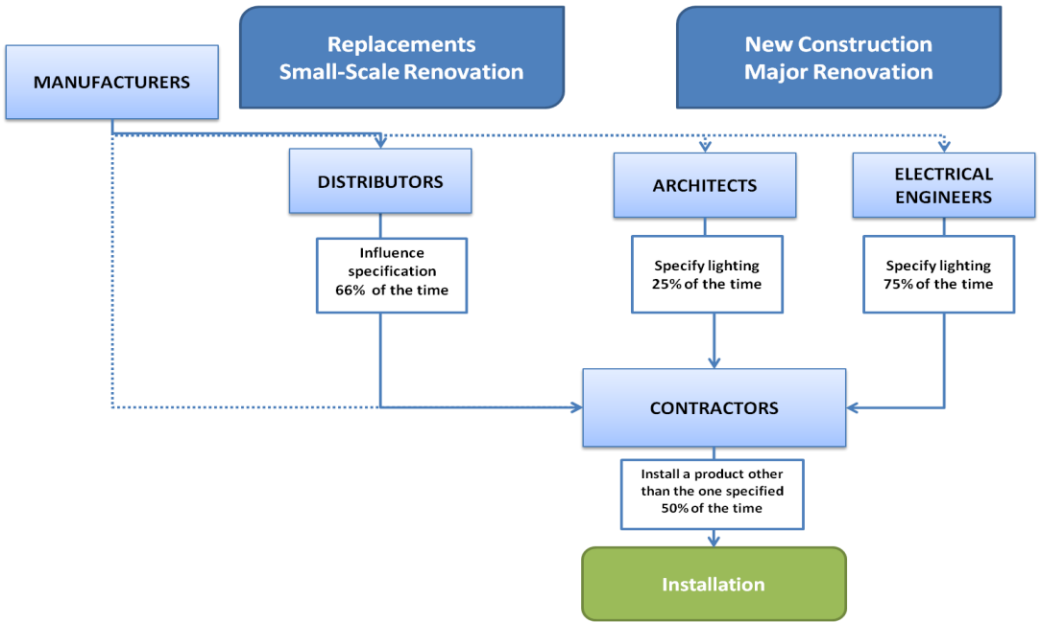

Source: Navigant Consulting, Inc. "2010 U.S. Lighting Market Characterization." U.S. DOE. January 2012.

Here are the market actors for the residential lighting market:

1. Federal/state regulators and other standards bodies,
2. Manufacturers,
3. Retailers and other distributors,
4. End-users.

The non-residential market and market actors are different than the residential sector. The non-residential market often involves all the residential lighting market actors, but also relies upon lighting distributors, building and project architects/engineers and contractor/installers, depending on the size of the project and business establishment.

Diagram: Non-Residential Stream of Influencers




Source: Xenergy, Inc. "Commercial and Industrial Lighting Study". Prepared for the Northwest Energy Efficiency Alliance. 2000. Kema, Inc., et al. "High Bay Lighting Market Effects Study: FINAL REPORT." Prepared for the California Public Utilities Commission. June 18, 2010.

iii. A market characterization and assessment of the relationships/dynamics among market actors, including identification of the key barriers and opportunities to advance demand side management technologies and strategies;

The CLTEESP identified the following market barriers that could impede successful implementation of the above goals:

(1) **Policy Barriers** that conflict with the accelerated adoption of best practice lighting technologies and systems required to meet the state's ZNE goals;
(2) **Lack of knowledge** regarding best practice lighting technologies among installers and other lighting professionals;

(3) **Proprietary protocols** that can limit innovation and interoperability of lighting systems and integration with other building and network systems;
(4) **Lack of retailer and consumer awareness** about lighting's invisible benefits, such as contributions to human performance, well-being and energy and cost savings;
(5) **Cost** constraints, including the challenge of encouraging end users to purchase and install best-practice lighting technologies and systems;
(6) **Gaps in the Research, Development and Demonstration (RD&D) infrastructure** that cause redundancies and unnecessary delays in rapid deployment of best practice technologies to the market.

iv. A description of the proposed intervention(s) and its/their intended results, and specify which barriers the intervention is intended to address;

v.

This IOU program can address the following barriers:

- **Lack of knowledge** regarding best practice lighting technologies among installers and other lighting professionals;
    - Intervention Opportunity: Provide education and training on lighting best practices to installers, contractors and other lighting professionals to improve awareness, knowledge and attitude.
        i. Intended Results: improve the awareness, knowledge and attitude (AKA) of contractors, installers and lighting professionals concerning lighting best practices. This improvement in AKA, will lead to program participation as well as spillover effects.

- **Lack of retailer and consumer awareness** about lighting's invisible benefits, such as contributions to human performance, well-being and energy and cost savings;
    - Intervention Opportunity: Provide education and training to retailers and distributors so they are armed with improved selling information and enhanced selling techniques
        i. Intended Results: improve the AKA of lighting retailers and distributors concerning both energy and non-energy benefits of EE lighting measures.

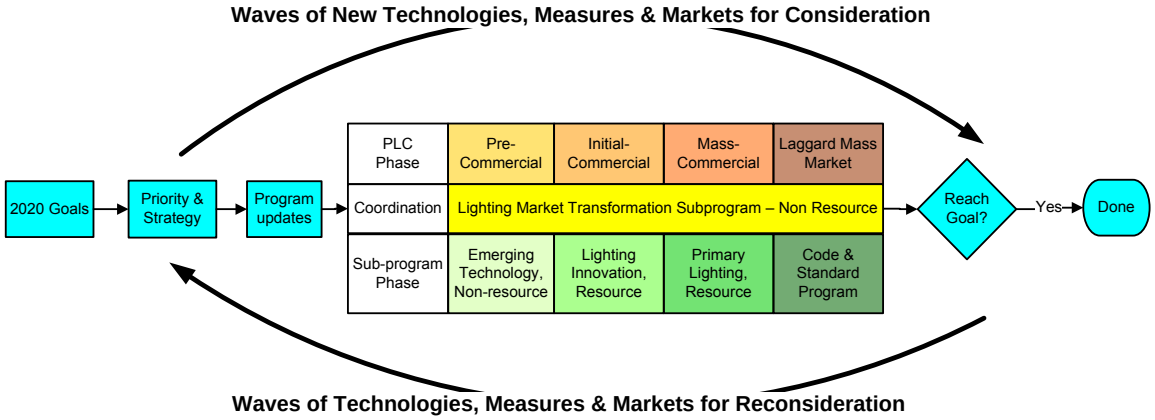
- **Cost** constraints, including the challenge of encouraging end users to purchase and install best practice lighting technologies and systems;
    - Intervention Opportunity: Provide an incentive to new and innovative lighting product where IOU intervention would accelerate the movement of product life cycle
        i. Intended Results: reduced prices for the targeted lighting products, leading to increasing purchase and installation of the program target measures. Over time,

the program can help reduce product costs, increase retailer shelf space, and variety of program qualified products. These effects will contribute to changes in the lighting market dynamic leading to lasting market change.

- **Gaps in the Research, Development and Demonstration (RD&D) infrastructure** that cause redundancies and unnecessary delays in rapid deployment of best practice technologies to the market.
    - Intervention Opportunity: Work with manufacturers to encourage the development of better energy saving products. Sample, test and verify lighting technology to reduce performance uncertainty
        i. Intended Results: Reduce performance and market uncertainty of new lighting measures and practices. This information could be used to improve programmatic design so program delivery mechanism could be more effective in reaching target customers and markets.

vi. A coherent program, or "market," logic model that ensures a solid causal relationship between the proposed intervention(s) and its/their intended results[7];

The Statewide Lighting programs are designed to use a market transformation framework to pull in new measures and technologies and to re-strategize the more mature measures and technologies. The diagram below describes this iterative process.




[7] If this logic model is the same as that requested in #10.(O), only provide once. As needed, provide a more detailed logic model emphasizing the market transformation elements of the program and/or how such elements integrate with resource acquisition elements.

Within this context, an IOU Decision Panel is formed, to manage and guide this process. The sub-program logic models will illustrate the interaction amongst the Lighting Market Transformation sub-program, Lighting Innovation sub-program and Primary Lighting sub-program.

vii. Appropriate evaluation plans and corresponding Market Transformation indicators and Program Performance Metrics based on the program logic model.

Due to the need to comply with the Decision's timeline for filing the 2013-2014 PIP, and our desire to comply with earlier Decisions that call for gathering stakeholder input in informing market transformation efforts, we suggest that a full market effects evaluation plan be developed during the formulation of the Joint EM&V Plan as described in section "18.1. Evaluation Budget" in Decision R.09-11-014. Until then, we suggest the following approach.

Summative evaluation: Market Effects. The market transformation program's theory and logic model will be used to guide the evaluation efforts. The scope of the market effects study should be defined by the MT program's scope. The timeline for specific market effects that are to be evaluated should be defined by the MT program theory. Among other indicators, the program theory may specify changes in market characteristics that can be evaluated, such as 1) spillover, 2) attitudes, awareness and knowledge, 3) reductions in a specific market barrier, 4) current pricing and product availability, and 5) other market milestones. We will make the following distinction between program "spillover" and market effects: spillover is energy savings not directly tracked by the program, whereas market effects are broader and would include spillover as well as meaningful changes in the structure or functioning of the market.

Formative evaluation. The formative evaluation of a market transformation program is typically performed at the intervention (i.e. program) level. The methods are the same as would be used in a program process evaluation, and would include interviews with program staff, participants and non-participants as well as an assessment of the program's direct outputs.

Market transformation indicator results shall be reported, as available, by Energy Division or the IOUs, depending upon who conducts the necessary market studies. (Res. 4385, 12/2/10)

Attribution. Outside of California, most guidelines for evaluating market transformation acknowledge that it is very difficult to attribute market effects to any single program, and nearly impossible to partition out the respective contributions of several coordinated programs on market effects and market

transformation. In California, the Framework (Sebold et al., 2001) emphasized that attribution of market effects to programs bears further research. Others (Rosenberg & Hoefgen, 2009; Keating & Prahl (MT Workshop, Nov 2011) suggest that declaring the program's strategic intent through the market transformation initiative's theory and logic model is key to establishing future claim on transformation effects. The methods proposed by Rosenberg & Hoefgen (2009) for attributing market effects to individual programs include a number of approaches, all of them qualitative: self-report of spillover and free ridership; cross-sectional comparisons with other geographic regions; structured expert judging; and case studies. But attribution using a "preponderance of evidence" approach would likely be expensive and still yield arguable results. Attribution by nature focuses on individual program efforts, and we believe the market transformation evaluation discourse should be focused on the overlapping synergy among all programs and influences in the market. We realize we all have a "Shared Mission" of meeting the CPUC's very aggressive Strategic Plan goals. We do not wish to not invest resources in teasing apart which program entity contributed how much, but instead will plan to focus on whether all the market forces across the State of California have succeeded in transforming the market.

**13) Additional information as required by Commission decision or ruling or as needed:**

## ATTACHMENT 1

### Program Non-Energy Objectives

For New or Substantially changed programs and sub-programs, provide the following information for Program Non-Energy Objectives and follow the format used for the previous cycle Program Performance Metrics found in Resolution E-4385.

i. List the primary SMART[8] non-energy objectives of the program.

ii. For each SMART objective, identify the quantitative targets, direction or percent of change that you hope to achieve during the program cycle.[9] .

iii. For each proposed SMART objective, describe any relevant baseline data on current market conditions that you have assembled or plan to assemble and the sources.

iv. Quantitative program targets (PPMs):

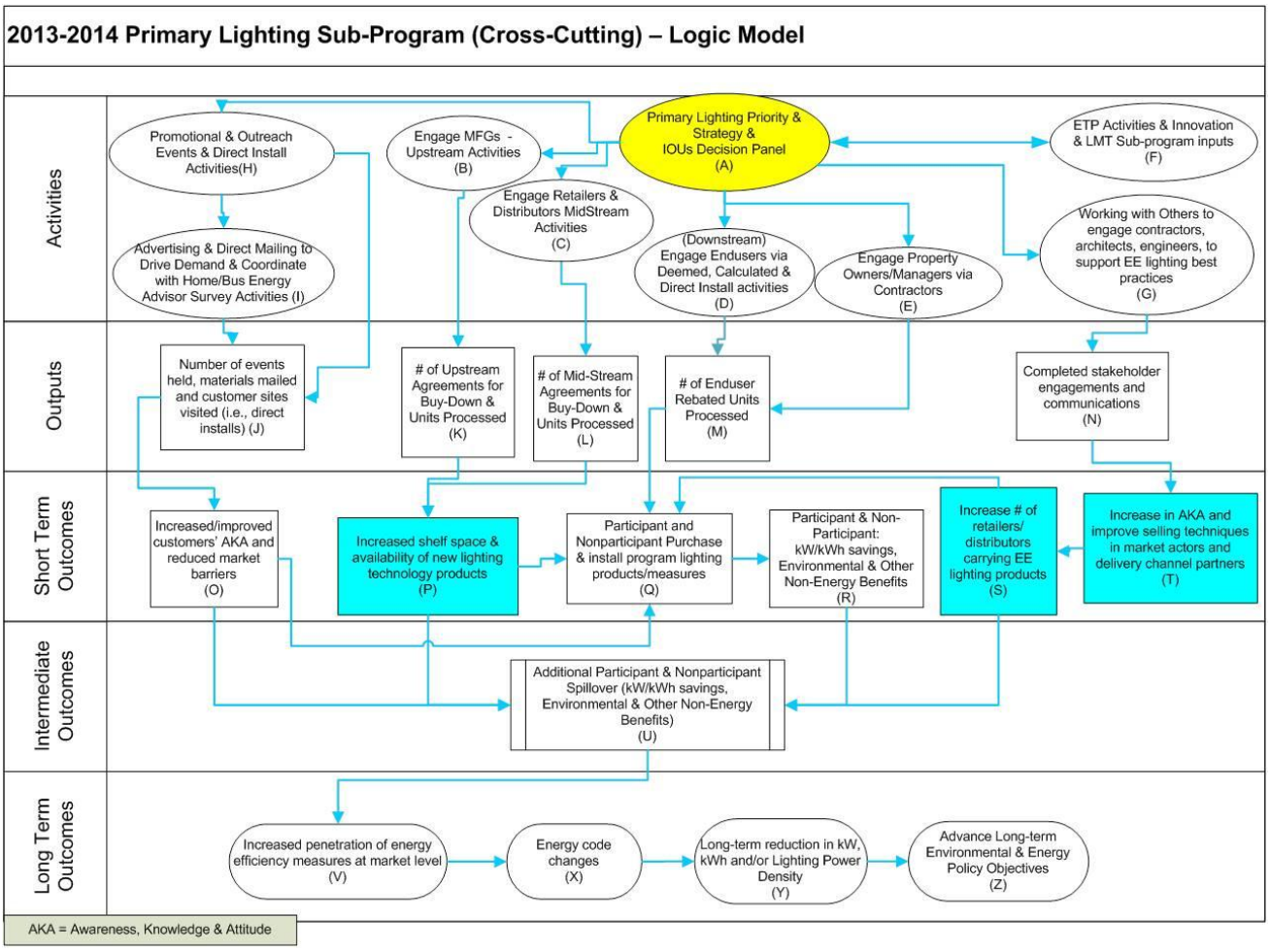
**Table 3. Quantitative Program Targets (PPMs)**

[8] A SMART objective is one that is **S**pecific (i.e. quantitative and quantifiable generally, in terms of the results to be achieved**), M**easurable, **A**mbitious, **R**ealistic, and **T**ime-bound. For example, for a vender training component of an innovative commercial program, two SMART mid-term objectives and one long-term objective might be:

a) During the period 2013-2014, the number of HVAC installers in the SCE service territory who are able to perform quality installations of energy efficient packaged air conditioners will increase by 20%.
b) During the period 2013-2014, the number of installations of energy efficient packaged air conditions in the SCE service territory that are considered quality installations will increase by 25%.
c) By 2020, installations of energy efficient packaged air conditions in the SCE service territory that are considered quality installations will increase by 75%.

[9] Please also add any new program objectives and quantitative targets for statewide programs to the portfolio PPM/MTI reporting template.

# ATTACHMENT 2



## ATTACHMENT 3

**Table 1: Projected Sub-Program Budget, by Calendar Year**

| | Program Year | | |
|---|---|---|---|
| **Sub-Program** | **2013** | **2014** | **Total** |
| Admin ($) | TBD | TBD | |
| General overhead ($) | TBD | TBD | |
| Incentives ($) | TBD | TBD | |
| Direct Install Non-Incentives ($) | TBD | TBD | |
| Marketing & Outreach ($) | TBD | TBD | |
| Education & Training | TBD | TBD | |
| Total Budget | TBD | TBD | |

Individual utility specific information to be provided in this table.

**Table 2: Projected Sub-Program Net Energy and Demand Impacts, by Calendar Year**

| | Program Years | | |
|---|---|---|---|
| | **2013** | **2014** | **Total** |
| **Primary Lighting** | | | |
| GWh | TBD | TBD | TBD |
| Peak MW | TBD | TBD | TBD |
| Therms (millions) | | | |

Individual utility specific information to be provided in this table

**Table 3: Quantitative Program Targets (PPMs)**

| **Target** | **2013** | **2014** |
|---|---|---|
| Number of _____ | Not yet final | Not yet final |
| Number of _____ | Not yet final | Not yet final |
| etc | | |

| Offer Group | Program Performance Metric (PPM) - Target | 2013 | 2014 |
|---|---|---|---|
| ***Upstream Incentives*** | 1. During 2013-2014, implement marketing efforts and/or campaign to encourage prompt installation of CFLs as required in D.09-09-047. (Y/N) | Y/N | Y/N |
| | 2. Percent of single brightness bare spiral CFLs 30 Watts or less incented by distribution channel* and by hard-to-reach (HTR)** zip-codes.<br>*"Distribution channels" are as defined in 06-08 Upstream Lighting Study<br><br>**"HTR" is as defined in the EE Policy Manual | Percent | Percent |
| | 3. Percent kW/kWh/Quantity of incented single brightness bare spiral CFLs 30 Watts or less as compared to the entire upstream component | Percent | Percent |
| | 4. Percent kW/kWh/Qty of incented single brightness bare spiral CFLs 30 Watts or less compared to percentages of other incented upstream product types. | Percent | Percent |
| | 5. Percent of products incented **other than** single brightness bare spiral CFLs 30 Watts or less, by distribution channel* and by hard-to-reach (HTR)** zip-codes.<br>*"Distribution channels" are as defined in 06-08 Upstream Lighting Study<br><br>**"HTR" is as defined in the EE Policy Manual | Percent | Percent |
| ***Deemed Lighting Incentives*** | *1. Number and percent of new, improved, or ETP energy efficient lighting measures** installed in the commercial, industrial and agricultural programs.<br>** "ETP measure" defined as ET measures first introduced into the EE portfolio since January 1, 2006 | Number & Percent | Number & Percent |
| | 2. Number and percent of participating commercial customers receiving the Integrated Bonus | Number & Percent | Number & Percent |
| ***Calculated Lighting Incentives*** | *1. Number and percent of new, improved, or ETP energy efficient lighting measures installed in completed calculated projects. | Number & Percent | Number & Percent |
| | *2. Number, percent, and ex-ante savings from commercial, industrial and agricultural sector of projects with ETP energy efficient lighting measures** included. (Report disaggregated savings by measure and number of installations by measure.)<br>** "ETP measure" defined as ET measures first introduced into the EE portfolio since January 1, 2006 | Number, Percent & Ex Ante Savings | Number, Percent & Ex Ante Savings |

The PPMs for Multi-Family and Direct Install Programs do not pertain to lighting measures. Third Party and Partnership offers are not assigned PPMs.

**Table 4: Work paper Status**

| # | Workpaper Number/Measure Name | Approved | Pending Approval | Submitted but Awaiting Review |
|---|---|---|---|---|
| 1 | TBD | | x | |
| 2 | | | x | |
| 3 | | | x | |
| 4 | | | x | |
| 5 | | | x | |
| 6 | | | x | |

**Table 5: Sub-Program Milestones and Timeline (example)**

| Offer | Milestone | Milestone | Date |
|---|---|---|---|
| Upstream & Retailer-Midstream | Assuming a Jan 1, 2013 CPUC Approval | Assuming a Jan 1, 2013 CPUC Approval | 1/1/2013 |
| | IOU 2013 Strategy Meeting Begin | IOU 2013 Strategy Meeting Begin | 9/1/2012 |
| | 2013 IOU Program Initiation Meeting | 2013 IOU Program Initiation Meeting | 1/8/2013 |
| | Agreements Written/Approved | Agreements Written/Approved | 2/22/2013 |
| | Materials Completed/Disseminated | Materials Completed/Disseminated | 3/1/2013 |
| | Incentive Reservations Start | Incentive Reservations Start | 4/1/2013 |
| | 2013 Program Participation Ends | 2013 Program Participation Ends | 12/31/2013 |
| | 2013 Annual Report | 2013 Annual Report | 5/1/2014 |
| | 2014 IOU Program Initiation Meeting | 2014 IOU Program Initiation Meeting | 9/1/2013 |
| | Materials Completed/Disseminated | Materials Completed/Disseminated | 11/1/2013 to 1/8/2014 |
| | Incentive Reservations Start | Incentive Reservations Start | 1/1/2014 |
| | Quarterly Progress Reports | Quarterly Progress Reports | 3/31/2014 – 12/8/2014 |
| | 2014 Annual Report | 2014 Annual Report | 5/1/2015 |

For lighting measures from Multi Family, Nonresidential Deemed, Nonresidential Calculated, Savings by Design, Partnerships, and Third Party offers, see the milestones included in their respective sub program PIP tables, where applicable.

## Table 6: Geographic Regions

| Geographic Region | [Insert Program/Sub-Program Name] |
|---|---|
| CEC Climate Zone 1 | |
| CEC Climate Zone 2 | |
| CEC Climate Zone 3 | |
| CEC Climate Zone 4 | |
| CEC Climate Zone 5 | |
| CEC Climate Zone 6 | Primary Lighting |
| CEC Climate Zone 7 | |
| CEC Climate Zone 8 | Primary Lighting |
| CEC Climate Zone 9 | Primary Lighting |
| CEC Climate Zone 10 | Primary Lighting |
| CEC Climate Zone 11 | |
| CEC Climate Zone 12 | |
| CEC Climate Zone 13 | Primary Lighting |
| CEC Climate Zone 14 | |
| CEC Climate Zone 15 | Primary Lighting |
| CEC Climate Zone 16 | Primary Lighting |
| System | Primary Lighting |

## Table 7: Program Administration of Program Components

| Program Name | Program Component (Offer) | Implemented by IOU Staff? (X = Yes) | Implemented by contractors to be selected by competitive bid process (if Yes then enter type of contractor/other market actor possibly used) | Implemented by contractors NOT selected by competitive bid process (list prime contractor and sub-contractor names) | Implemented by local government or other entity ( X = Yes) |
|---|---|---|---|---|---|
| Primary Lighting | Upstream and Retailer-Midstream | X | | | |
| Primary Lighting | Plug-in Lamp Exchange | | Event & Services Implementer | | |
| Primary Lighting | Multi-Family/Mobile Home Lighting | X | | | |
| Primary Lighting | Deemed Lighting Incentives | X | | | |
| Primary Lighting | Calculated Lighting Incentives | X | | | |
| Primary Lighting | Savings by Design | x | | | |
| Primary Lighting | Partnership Program Lighting | X | | | |
| Primary Lighting | Commercial Direct Install Lighting | | Contractor/installer | | |
| Primary Lighting | Third Party Program Lighting | | Program Implementer | | |

## Table 8: Customer Eligibility Requirements (Joint Utility Table)

| Customer Eligibility Requirement (list of requirements) | PGE | SCE | SDGE | SCG |
|---|---|---|---|---|
| Upstream and Retailer-Midstream - None | x | x | x | |
| Plug-in Lamp Exchange - Customer of Applicable IOU | | x | | |
| Multi-Family/Mobile Home - In Sector & Customer of Applicable IOU | x | x | x | |
| Deemed Lighting Incentives - Nonresidential Customer of Applicable IOU | x | x | x | |
| Calculated Lighting Incentives - Nonresidential Customer of Applicable IOU | x | x | x | |
| Savings By Design - Nonresidential New Construction Customer of Applicable IOU | | x | x | |
| Partnership Program Lighting - Government or related entity | | x | | |
| Commercial Direct Install Lighting - Small Commercial Customer of Applicable IOU | | x | x | |
| Third Party Program Lighting - Varies by Program | | x | | |

The utilities must work together and submit this table jointly in their respective applications

## Table 9: Contractor Eligibility Requirements (Joint Utility Table)

| Offer | Contractor Eligibility Requirement (list of requirements) | PGE | SCE | SDGE | SCG |
|---|---|---|---|---|---|
| Upstream | Signed Manufacturer Participation Agreement | x | x | x | |
| | Completed Reservation Request | x | x | x | |
| | Signed Notification of Allocation Form | x | x | x | |
| | Confirmation of Allocation Received from IOU | x | x | x | |
| | ENERGY STAR® listed if products are applicable to listing | x | x | x | |
| | Proven business entity validity, established clientele | x | x | x | |
| | Demonstrated track record | | x | | |
| | Financial ability to indemnify IOU | | x | | |
| | Competence demonstrated in the application process | | x | | |
| Non-Res Deemed | Must provide customer information that meets customer eligibility requirements | x | | | |
| | Must provide completed deemed/express application | x | | | |
| | For existing midstream measures: submit participation agreement | x | | | |
| Non-Res Calculated | Must provide customer information that meets customer eligibility requirements | x | | | |
| | Must provide completed customized retrofit application | x | | | |
| Multi-Family | Must provide customer information that meets customer eligibility requirements | x | | | |
| | Must submit completed program reservation form | x | | | |

For lighting measures from Multi Family, Nonresidential Deemed, Nonresidential Calculated, Savings by Design, Partnerships, and Third Party offers, see the eligibility requirements included in their respective sub program PIP tables.

List any contractor (and/or developer, manufacturer, retailer or other "participant") eligibility requirements (e.g. specific IOU required trainings; specific contractor accreditations; and/or, specific technician certifications required).
The utilities must work together and submit this table jointly in their respective applications

**Table 10: Manufacturer/Retailer/Distributor Partners**

| **Manufacturer/Retailer/Distributor Partner Information** | **PGE** | **SCE** | **SDGE** | **SCG** |
|---|---|---|---|---|
| | [list kinds of manufacturers] | [list kinds of manufacturers] | [list kinds of manufacturers] | [list kinds of manufacturers] |
| Manufacturers enrolled in program | CFL | CFL | CFL | |
| Manufacturers enrolled in program | LED | LED | LED | |
| Manufacturers enrolled in program | Fixtures | Fixtures | Fixtures | |
| Manufacturers enrolled in program | Controls | Controls | Controls | |
| Manufacturers enrolled in program | HID | HID | HID | |
| Manufacturers enrolled in program | Linear Fluorescent | Linear Fluorescent | Linear Fluorescent | |
| Manufacturers enrolled in program | Induction | Induction | Induction | |
| Manufacturers enrolled in program | Cold Cathode | Cold Cathode | Cold Cathode | |
| Manufacturers enrolled in program | Other (eg. Plasma, OLED) | Other (eg. Plasma, OLED) | Other (eg. Plasma, OLED) | |
| Manufacturers targeted for enrollment in program | CFL | CFL | CFL | |
| Manufacturers targeted for enrollment in program | LED | LED | LED | |
| Manufacturers targeted for enrollment in program | Fixtures | Fixtures | Fixtures | |
| Manufacturers targeted for enrollment in program | Controls | Controls | Controls | |
| Manufacturers targeted for enrollment in program | HID | HID | HID | |
| Manufacturers targeted for enrollment in program | Linear Fluorescent | Linear Fluorescent | Linear Fluorescent | |
| Manufacturers targeted for enrollment in program | Induction | Induction | Induction | |
| Manufacturers targeted for enrollment in program | Cold Cathode | Cold Cathode | Cold Cathode | |
| Manufacturers targeted for enrollment in program | Other (eg. Plasma, | Other (eg. Plasma, | Other (eg. Plasma, OLED) | |

| | | | | |
|---|---|---|---|---|
| | OLED) | OLED) | | |
| Retailers enrolled in program | Mass Merchandise | Mass Merchandise | Mass Merchandise | |
| Retailers enrolled in program | Home Improvement | Home Improvement | Home Improvement | |
| Retailers enrolled in program | Large Grocery | Large Grocery | Large Grocery | |
| Retailers enrolled in program | Small Grocery | Small Grocery | Small Grocery | |
| Retailers enrolled in program | Discount | Discount | Discount | |
| Retailers enrolled in program | Drug | Drug | Drug | |
| Retailers enrolled in program | Electronics | Electronics | Electronics | |
| Retailers enrolled in program | Hardware | Hardware | Hardware | |
| Retailers enrolled in program | Miscellaneous Other | Miscellaneous Other | Miscellaneous Other | |
| Retailers targeted for enrollment in program | Mass Merchandise | Mass Merchandise | Mass Merchandise | |
| Retailers targeted for enrollment in program | Home Improvement | Home Improvement | Home Improvement | |
| Retailers targeted for enrollment in program | Large Grocery | Large Grocery | Large Grocery | |
| Retailers targeted for enrollment in program | Small Grocery | Small Grocery | Small Grocery | |
| Retailers targeted for enrollment in program | Discount | Discount | Discount | |
| Retailers targeted for enrollment in program | Drug | Drug | Drug | |
| Retailers targeted for enrollment in program | Electronics | Electronics | Electronics | |
| Retailers targeted for enrollment in program | Hardware | Hardware | Hardware | |
| Retailers targeted for enrollment in program | Miscellaneous Other | Miscellaneous Other | Miscellaneous Other | |
| Retailers targeted for enrollment in program | Web Sales | Web Sales | | |
| Distributors enrolled in program | Contractors | Contractors | Contractors | |
| Distributors enrolled in program | Electrical Wholesale | Electrical Wholesale | Electrical Wholesale | |
| Distributors targeted for enrollment in program | Lighting Wholesale | Lighting Wholesale | Lighting Wholesale | |
| Distributors targeted for enrollment in program | Electrical Wholesale | Electrical Wholesale | Electrical Wholesale | |
| Distributors targeted for enrollment in program | Contractors | Contractors | Contractors | |
| Distributors targeted for enrollment in program | ESCOs | ESCOs | ESCOs | |

**Table 11: Summary Table of Measures, Incentive Levels and Verification Rates**

Explanatory Information:

- Upstream measure incentives indicate the maximum. Manufacturers or retailers are allowed to request per-unit incentives lower than the maximum (published) amounts to optimize cost-effectiveness

- Products appearing in this list made non-cost-effective due to new codes or policies could be offered in limited quantities, or discontinued from activity
- Exchange, Direct Install, 3rd Party Turnkey, and Partnership incentives were taken from historical minimum and maximum figures. Incentive ranges related to pricing may vary in 2013-2014.
- Ranges of incentives in this format: "$.03-$.25/$100" mean minimum $0.03 per KWh and maximum $0.25 per KWh, or up to $100 per kW for calculated offerings.

| **Measure Group** | **Market Actor Receiving Incentive or Rebate** | **PGE** | | **SCE** | | **SDGE** | | **SCG** | |
|---|---|---|---|---|---|---|---|---|---|
| | | **Maximum Incentive Level or Range** | **Installation Sampling Rate** | **Maximum Incentive Level or Range** | **Installation Sampling Rate** | **Maximum Incentive Level or Range** | **Installation Sampling Rate** | **Incentive Level** | **Installation Sampling Rate** |
| | | | TBD | | TBD | | TBD | | |
| CFL Fixtures | End Use Customer | n/a | | $8.69-$15.5 | | | | | |
| CFL | End Use Customer | $.03-$.25/$100 | | $.03-$.25/$100 | | $.05/$100 | | | |
| CFL Lamp | Manufacturer or Retailer | $0.9-$1.90 | | $0.9-$1.90 | | $0.9- $1.90 | | | |
| CFL Lamp | Contractor | $3.00-$7.00 | | $3.00-$7.00 | | | | | |
| CFL Lamp | End Use Customer | n/a | | $.52-$198.42 | | | | | |
| Cold Cathode | End Use Customer | n/a | | $4.00-$162 | | | | | |
| Control Sensor | Contractor | $15.00-$30.00 | | $15.00-$30.00 | | | | | |
| Control Sensor | End Use Customer | $11.00-$100 | | $7.00-$426.82 | | | | | |
| Controls | End Use Customer | $.03-$.25/$100 | | $.03-$.25/$100 | | $.05/$105 | | | |
| Controls per kWh | Builder | n/a | | $0.10 | | | | | |
| Controls Vending Machine | End Use Customer | n/a | | $220- $440 | | | | | |
| HID Fixture | End Use Customer | n/a | | $218.40-$262.30 | | | | | |
| HID | End Use Customer | $.03-$.25/$100 | | $.03-$.25/$100 | | | | | |
| Induction Fixture | End Use Customer | $25.00-$125.00 | | $25.00-$125.00 | | | | | |
| Induction | End Use Customer | $.03-$.25/$100 | | $.03-$.25/$100 | | | | | |
| LED | End Use Customer | $.03-$.25/$100 | | $.01-$.25/$100 | | | | | |
| LED Channel Signs per foot | End Use Customer | | | $2.00-$6.00 | | | | | |
| LED Exit | End Use | n/a | | $71.00- | | | | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Sign | Customer | | | $150 | | | | | |
| LED Fixture | End Use Customer | $30.00 | | $27.00-$122.83 | | | | | |
| LED Lamp | Contractor | | | $30 | | | | | |
| LED Lamp | End Use Customer | $5.00-$20.00 | | $5.00-$163.78 | | | | | |
| LED Lamp | Manufacturer or Retailer | $15.00 | | $15.00-$20.00 | | $15.00-$20.00 | | | |
| LED refrigerated display case lighting per door | End Use Customer | $100.00 | | $50.00 | | | | | |
| LED String | End Use Customer | n/a | | $6.94-$30.49 | | | | | |
| Linear Fluorescent De-lamping | End Use Customer | n/a | | $0.04-$1/$64.66 | | | | | |
| Linear Fluorescent Fixture | Contractor | $25.00-$36.00 | | $18.00-$40.00 | | | | | |
| Linear Fluorescent Fixture | End Use Customer | $25.00-$200 | | $0- $965 | | | | | |
| Linear Fluorescent Lamp | End Use Customer | $1-$4 | | $1.00-$4.00 | | | | | |
| Linear Fluorescent Retrofit | End Use Customer | $.03-$.25/$100 | | $.03-$.25/$100 | | | | | |
| Metal Halide Lamp | End Use Customer | $15.00-$75.00 | | $15.00-$75.00 | | | | | |
| Reflector CFL Lamp | End Use Customer | $7.00 | | $7.00-$18.28 | | | | | |
| Specialty CFL Lamp | Manufacturer or Retailer | $2.50-$3.50 | | $2.50-$3.50 | | $2.50-$3.50 | | | |
| Table/Desk/ Floor Lamps | Manufacturer or Retailer | $5.00-$15.00 | | $5.00-$30.18 | | | | | |

**Table 12: Additional Services**

| Additional Services that the Sub-Program Will Provide | To Which Market Actors | PGE | SCE | SDGE | SCG |
|---|---|---|---|---|---|
| Orientation and Training | Upstream and Midstream Participants | TBD | No Charge, Normal Operations | TBD | |
| Promotional and Educational materials | Upstream and Midstream Participants | TBD | No Charge, Normal Operations | TBD | |

For each service provided, indicate any expected charges to market actors of the services, and/or the level at which any such services will be incented or funded.

**Table 13: Program Related Audits**

| Levels at Which Program Related Audits Are Rebated or Funded | Who Receives the Rebate/Funding (Customer or Contractor) |
|---|---|
| No plans exist for audits rebated or funded to recipients such as customers or contractors, nor for software tools for the purposes of auditing. | |

NOTE: If software tools are required sub-program participation, and if there is a program related audit for the sub-program, this table shows the levels at which the audit is rebated or funded and to whom such rebates/funding will be provided (i.e., customer or contractor)

**Table 14: Quality Assurance Provisions**

| QA Requirements | QA Sampling Rate (Indicate Pre/Post Sample) | QA Personnel Certification Requirements |
|---|---|---|
| QA/QC requirements #1 – See Upstream below | 90/10 Confidence/Precision | The random sampling will be done by the SDG&E. There is quarterly reporting requirement and issue resolutions. |
| QA/QC requirements #2 – See Midstream below | 90/10 Confidence/Precision | Same as above |
| QA/QC requirements #3 – See Downstream below | 90/10 Confidence/Precision | Same as above |

NOTE: Please list quality assurance, quality control, including accreditations/certification or other credentials required.

IOU quality assurance procedures may vary:
For SDG&E, a third party field inspection team performs random inspections at the participating retailer outlets. Each participating retailer outlet will be inspected at least once a year, actual number of inspection will depend on program activity volume. At the inspection, the following information are collected and verified: retailer information, manufacturer information, product information (e.g. product SKU, MSRP, Incentive level), marketing information (e.g. signage), etc. The inspection team will notify the IOU program team for correction should there be any non-compliance issue. Monthly and quarterly reports will be generated for quality assurance and continuous improvement purposes."

**Table 15: Cross-cutting Sub-program and Non-IOU Partner Coordination**

| Sub-Program Name | | |
|---|---|---|
| **Other IOU Sub-program Name** | **Coordination Mechanism** | **Expected Frequency** |
| Lighting Market Transformation | Individual or Group Meetings and Email | Weekly |
| Lighting Innovation | Individual or Group Meetings and Email | Weekly |
| Multi-Family | Individual Meetings | As needed |
| Deemed & Calculated Nonresidential | Individual or Group Meetings and Email | As needed |
| Emerging Technologies | Individual or Group Meetings and Email | As needed |
| 3rd Party & Direct Install | Individual or Group Meetings and Email | As needed |
| Codes & Standards | Individual Calls or Meetings | As needed |
| Coordination Partners Outside CPUC | | |
| ENERGY STAR | Group Meetings, Calls and Email | Twice annually |
| CEE | Group Meetings, Calls and Email | Three times annually |
| Lighting Manufacturers | Individual Meetings, Group Meetings, Calls, and Email | Ongoing weekly |
| Major Retailers | Individual Meetings, Group Meetings, Calls, and Email | As needed, roughly twice yearly |
| DOE | Team Conference Calls | Roughly Quarterly |
| CEC | Group Meetings | Roughly Annually |
| DLC | Group Meetings, Calls and Email | Twice annually |
| CLTC | Group Meetings, Calls and Email | As needed, roughly twice yearly |

Note: "Mechanisms" refers to communication methods (i.e. quarterly meetings; internal list serves; monthly calls, etc.) and/or any cross-program review methods (i.e., feedback on program plans; sign off on policies, etc). or harmonization techniques (i.e. consistent certification requirements across programs, program participant required cross trainings, etc).

**Table 16: Non-EE Sub-Program Information**

| Sub-Program Name | | |
|---|---|---|
| **Non-EE Sub-Program** | **Budget** | **Rationale and General Approach for Integrating Across Resource Types** |
| Not Applicable to Primary Lighting | | |

# 2013-2014 PIP Addendum

| | | | |
|---|---|---|---|
| **Program Name** | Statewide Emerging Technologies Program | **Date Submitted** | July 2, 2012 |
| **Subprogram Name** | Technology Development Support<br>Technology Assessment Support<br>Technology Introduction Support | **Utility Name** | San Diego Gas & Electric |
| **Program ID** | | **IOU Program Contact** | |
| | | **Program Cycle** | 2013 - 2014 |

This form is to be used to document any required changes to the Program Implementation Plans (PIPs). The following are triggers that will require a PIP change:

1. Changes to eligibiity rules
2. Changes affecting incentive levels (indicate advice letter approval below if required)
3. Fund shifts (indicate advice letter approval below if required)
4. Portfolio Budget and Other Commission–Directed Changes
5. Changes to Program Theory/Logic Models
6. Addition or elimination of programs and/or sub-programs (indicate advice letter approval below)
7. Changes in program targets
8. Change in sub-program approach - unless the IOUs submit logic models for the sub-programs (to be defined) with IOUs
9. Changes in incented measures
10. Changes in adopted PPMs/MTIs (indicate advice letter approval below if required)

**Identify Specific Trigger (above) requiring the PIP change**

6. Addition or elimination of programs and/or sub-programs (indicate approved advice letter)

**Driver of Change:**

Re-alignment of program elements into subprograms to boarden ETP tasks and align with ETP mission.

**Description of Change (if advice letter approval required, indicate Commission resolution or approval and provide hyperlink to advice letter):**

See redline PIP.

**PIP Section and/or Wording to be Changed or replaced:**

See redline PIP.

**Replacement Language or Information**

See redline PIP.

**Revised Energy Savings (If Any):**

NA

**Other PIP Changes Required:**

NA

Revision Date: 05/11/2012

1. **Program Name:** Emerging Technologies Program (ETP)
   **Program ID:**
   **SDG&E Program Type**: Core

## 2. Projected Program Budget Table

Table 1

| Program Code | Program Name | Administrative Amount | Marketing Amount | Direct Install Amount | Incentive Amount | Total Budget Amount |
|---|---|---|---|---|---|---|
| | **SW Emerging Technologies Programs** | | | | | |
| 3246 | SW-ET-Technology Introduction Support | $222,600 | $16,500 | $1,245,922 | $0 | $1,485,021 |
| 3247 | SW-ET-Technology Assessment Support | $164,110 | $4,800 | $911,134 | $0 | $1,080,044 |
| 3248 | SW-ET-Technology Deployment Support | $20,644 | $600 | $113,769 | $0 | $135,013 |
| | TOTAL: | $407,355 | $21,900 | $2,270,825 | $0 | $2,700,079 |

*Note: Administrative costs in addition to exhibited program element costs. Funding for activities, operations, and projects previously funded under program elements Technology Test Centers, Market and Behavior Studies, Scaled Field Placements, Demonstration Showcases, Business Incubation Support, and Program Management & CPUC Reporting have been distributed to the three ET subprograms. Per 2013-2014 portfolio guidance decision, HVAC Technologies and Systems Diagnostics Advocacy (HTSDA) will be incorporated into ETP. A planning budget breakdown as per the guidance decision in included in Appendix 1.
** Outreach efforts are part of the direct implementation budget.

## 3. Program Mission

The mission is to support "increased energy efficiency market demand and technology supply" (the term supply encompassing breadth, depth, and efficacy of product offerings) by contributing to development, assessment, and introduction 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.

Increased market demand and increased technology supply are reinforcing effects – each working to spur the other. As market demand increases, market-pull leads to technology supply increases. As technology supply increases, changes in perceptions and attitudes, work to stimulate increased market demand.

Increased market demand works to address energy efficiency goals in both the near term and longer term. In the near term, increased market demand will lead to higher adoption rates of currently available energy efficiency measures. Market demand can be increased by either reducing barriers to adoption or through increasing incentives to adopt. In either case, as barriers (disincentives) shrink relative to incentives, adoption rates will grow. One example of a barrier to EE measure adoption is performance uncertainty, where an incentive example is an environmental concern.

A longer-term effect of increased market demand for EE measures is the spurring of market pull for yet-to-be-developed EE measures. Generally, market-pull product development usually takes place when some specific need is discovered in the marketplace that currently is either being ignored, not well served, or just not recognized. As technology developers become aware of unmet consumer needs for EE measures, development will be undertaken to

fulfill those needs in the future. Market pull created by increased market demand will result in longer-term increases in technology supply.

Increased technology supply also works to address energy efficiency goals in both the near term and longer term. In the near term, increased technology supply will lead to more EE measure adoption at current levels of market demand. Factors contributing to this increase would be more applications for which EE measures are available, lower prices due to competition, and increased measure effectiveness. Technology can generally be increased through improving incentives to invest in new measures or decreasing the difficulty of developing and launching new measures. In either case, as difficulty shrinks relative to incentive, development of new technology supply will grow. One example of decreasing the difficulty of developing an EE measure is a pre-existing testing protocol. An example of incentive to invest in a new technology is a building code driving future customer purchases.

A longer-term effect of increased technology supply of EE measures is the development of future market demand. Generally, as breadth, depth, and efficacy of available products in a new market segment increases, consumer perceptions and attitudes will change. Items previously viewed as niche become more mainstream. Energy usage considerations will become a more expected aspect of the products consumers purchase. In this way, increases in technology supply will result in longer-term increases in market demand.

By advancing these goals and objectives, the ETP supports California's energy and demand savings targets as defined by the following regulatory and legislative documents:

- The Energy Efficiency Rulemaking 09-11-014 providing guidance for 2013-2014 portfolios (2013-2014 Decision)
- The 2010-2012 Energy Efficiency (EE) Application 08-07-021, et. al. and related CPUC guidance in Rulemaking 06-04-010;
- The California Long Term Energy Efficiency Strategy (Strategic Plan), with particular focus on the big, bold initiatives in the domains of residential and commercial ZNE buildings, HVAC industry transformation, as well as lighting innovation; and
- The California Global Warming Solution Act of 2006 (Assembly Bill 32).

The ETP will leverage all complementary efforts and entities in support of its mission, including other statewide and local IOU EE programs; statewide utilities' emerging technologies programs; and EE innovation activities by external organizations such as private industry, industry trade organizations, corporate laboratories, CEC, U.S. DOE and national laboratories, and regional, national and international ETP partners including utility, academia, non-governmental organizations, and other market stakeholders.

Section 4 of this PIP describes the rationale for and expected outcome from the ETP in relation to market and technology barriers and the Strategic Plan. Three sub-programs central to the ETP's ability to address its mission and achieve its goals and objectives are also described in Section 4, below. These sub-programs drive the process of evaluating the application of energy-saving measures in real-world settings and building a pipeline of measures to consider for deployment through utility EE programs.

## 4. Program Rationale & Expected Outcome

California consumers report they are eager for solutions to climate change and other environmental issues, and California's IOUs have implemented a vast array of programs to support the purchase and use of EE measures. Many of these programs have seen tremendous success, yielding energy and demand savings that have reduced the need for new generation, transmission, and distribution facilities, lowered ratepayer energy bills, and avoided tons of greenhouse gas emissions.

To meet California's ambitious EE goals, new measures must be added to ensure program success in 2013-2014,and beyond. However, a host of market barriers can delay new measure introduction and adoption. Delayed adoption in turn diminishes, slows, or even eliminates the potential energy and environmental benefits of new measures, as well as the attractiveness of investing in and developing these measures.

To achieve success, the ETP will focus its operations on three core sub-programs. Each of the sub-program is briefly presented within this section (Section 4) of the program implementation plan. Note: With the experience gained from implementing the 2010-2012 program, it becomes clear that the 2010-2012 program "elements" are better understood as *tactics*, or tools, that can be utilized to address more than one ETP Goal; there is not a one-to-one mapping of tactic to Goal. A tactic or a set of tactics may be applied in coordination to advance overall ETP goals. Accordingly, the descriptions of the old elements have been refreshed for 2013-2014 to reflect broader program elements. Please see Table 2 for a depiction of how the 2010-2012 elements have been distributed. Please also refer to each section's subheading for the updated 2013-2014 categorization of these approaches. For readers already familiar with the 2010-2012 ETP, we recommend you start reading at Section 5. "Program Goals, Objectives, Action Strategies & Performance Metrics".

1. **Technology Development Support (TDS)**
2. **Technology Assessments (TA)**
3. **Technology Introduction Support (TIS)**

**Table 2. Mapping of the 2010-2012 "elements" into the new 2013-2014 sub-programs**

| **2013-2014 Subprogram** | **Goal** | ***Merged 2010-2012 ETP "Elements"** |
|---|---|---|
| Sub-program #1 Technology Development Support Subprogram | Increased EE technology supply (Support the development of new technologies) | - Technology Development & Support<br>- TRIO<br>- Market Studies and Behavioral Studies |
| Sub-program #2 Technology Assessments Subprogram | Increased number of measures offered by EE programs (Identify promising technologies for EE programs) | - Technology Assessments<br>- Demonstration Showcases<br>- Market Studies and Behavioral Studies<br>- Technology Test Center (SCE only) |

| | | |
|---|---|---|
| Sub-program #3 Technology Introduction Support Subprogram | Support technology introduction and whole-building deep-energy reduction solutions ("Seed" market demand among targeted end users) | - Scaled Field Placements<br>- Demonstration Showcases<br>- TRIP Solicitations (implemented in 2012 by SCE only. New to ETP in 2013-2014)<br>- Market Studies and Behavioral Studies |

* HVAC Statewide Program's HTSDA Subprogram has been integrated in to the ETP program in 2013-2014 and will be implemented in the new three ETP subprograms.

The ETP has established three goals and seven objectives as the means to achieve its mission. Section 5 of this PIP elaborates these goals in detail.

**ETP Goal#1:** Increased EE technology supply
**ETP Objective 1.1:** Support technology development
**ETP Objective 1.2:** Conduct technology developer outreach through TRIO

**ETP Goal #2:** Increased number of measures offered by EE programs
**ETP Objective 2.1:** Perform Technology Assessments
**ETP Objective 2.2:** Transfer measures into EE programs

**ETP Goal #3:** Support technology introduction and whole-building deep-energy reduction strategies
**ETP Objective 3.1:** Conduct field deployments
**ETP Objective 3.2:** Conduct technology demonstrations
**ETP Objective 3.3:** Conduct Technology Resource Innovation Program (TRIP) Solicitations

Table 3 highlights the various parameters to highlight the distinctions between the new three ETP subprograms for 2013-2014

**Table 3. Distinction Between ETP Subprograms**

| ***Parameter*** | **Technology Development Support** | **Technology Assessments** | **Technology Introduction Support** |
|---|---|---|---|
| ***Purpose*** | specifications, outreach → mid- to long-term EE technology supply | performance, cost data, market potential → EE programs | market exposure |
| ***Theme*** | spur technology development | evaluation | first-hand experience/Exposure |
| ***Units installed*** | none to one lab evaluation in some cases | one to a few (exceptionally, many) or entire floor/building/facility | a few to many (or entire floor/building/facility) |

| | | | |
|---|---|---|---|
| ***Number or sites*** | none to one | one to a few (exceptionally, many) | one to a few (exceptionally, many) as strategically valuable |
| ***Unique measures*** | one up to whole system | one up to whole system | one up to whole system or whole building |
| ***Customer involvement*** | none | one or a few users | few to many users or viewers |
| ***Duration*** | short to medium | medium to long | as needed (typically long) |
| ***Data collection*** | detailed | detailed | none to moderate |
| ***Preferred Dissemination mechanism*** | printed report, outreach, & other media | printed report & other media | printed report & other media along with first-hand experience and word of mouth |

**Program Design to Overcome Barriers**

The ETP focuses on four priority market and technology barriers:

**A. Information or search costs -** the value of time spent identifying, learning about, and locating EE measures.

**B. Performance uncertainties –** the difficulties and costs of acquiring the information needed to evaluate performance claims for EE measures.

**C. Organizational practices or customs –** behavior by companies, departments, professional groups, and government entities that has been institutionalized and may discourage forward thinking and proactive implementation of EE measures.

**D. Product or service unavailability –** limited supply and/or distribution of EE measures. For instance, a customer may want to buy task lights using solid-state lamp technology, but finds that vendors and distributors cannot meet the customer's volume requirements or other specifications.

In addition, other EE programs and market factors will have responsibility for, and ETP will contribute to, actions to overcome the following customer barriers.

- **Hidden costs** – unexpected costs emerging after the initial decision to implement an EE measure. For instance, a hidden cost under the Big, Bold strategies would be the expense of training contractors on new types of lighting or HVAC measures.
- **Asymmetric information and opportunism** – concerns about reliability/applicability of measure developer and vendor claims. Collaborating with the work of universities and technical information providers, such as E Source, the ETP can act as a resource to assist EE programs in addressing these claims.

The statewide IOUs' revision of the ETP scope for 2013-2014 to include three sub-programs represents a response mindful of insights from previous ETP program years and past ETP EM&V studies. The IOUs will utilize these sub-program elements in a comprehensive effort to address the range of EE market barriers that ETP can either influence directly or through efforts supporting other EE and IDSM programs. Following are descriptions of the 2010-

2012 six ETP elements and how they have been re-characterized as sub-programs in 2013-2014. Descriptions include supporting rationale, how each contributes to overcoming one or more market or technology barriers, and expected outcomes.

1. **Technology Assessments Subprogram** – (2013-2014: Changed to Subprogram #2; please see Table 2)
   a. Energy efficient measures that are new to a market or under-utilized for a given application will be evaluated for performance claims and overall effectiveness in reducing energy consumption and peak demand.
   ET assessments may utilize data/information from different sources including: *in situ* testing (customer or other field sites), laboratory testing, or paper studies may be used to support assessment findings. In addition to other findings and/or information, assessments typically would generate the data necessary for EE rebate programs to construct a work paper estimating energy and demand savings over the life of the measure.
   Assessment proposals are screened before an assessment is initiated. The screening process considers:
   - The measure's alignment with EE program strategy and Strategic Plan goals;
   - The measure's projected magnitude of contribution towards kWh and kW reduction and/or Strategic Plan goals. This includes both the effectiveness of an individual measure and the potential number of adopted measures;
   - The degree to which the assessment output will incrementally impact the measure's adoption rate;
   - Information necessary to be generated for EE program inclusion and the effectiveness of an assessment in producing this information; and
   - Resources (expense, labor) necessary to execute the assessment.

   To ensure that technology lab assessments can be conducted properly, state-of-the-art test facilities staffed with knowledgeable engineers and scientists will be available to ETP project managers. These facilities will be focused toward broad initiatives like ZNE, as well as specific end-uses, such as refrigeration, lighting, water heating, and air conditioning. In all respects, they will allow independent verification of performance claims and quantification of energy and demand savings.

   b. <u>Rationale</u>
   The assessment function is a contributor to the transfer of promising measures into the utility portfolio.

   c. <u>Barriers addressed</u>
   Assessments address information or search costs, performance uncertainties, organizational practice or customs, as well as contributing to efforts by others to overcome hidden costs and asymmetric information and opportunism.
   For instance, assessment reports reduce the time that IOU customers must spend looking for and confirming the performance of EE measures – either directly when the customer reads the ETP report, or indirectly, when the customer

receives education or marketing material through EE channels based on ETP assessment findings.
Similarly, ETP communications on measures that are being transferred or have been transferred to EE programs will assist companies, departments, and governmental entities in understanding EE measures' actual performance, thereby breaking down barriers to proactive implementation.

d. Expected outcomes
Technology assessments will contribute to increased measure awareness, market knowledge and reduced performance uncertainties for ETP stakeholders and IOU customers. Studies will aid in the acceptance and adoption of new technologies, especially those technologies which will be used in EE portfolios. This will lead to changes in organizational practices and customs that may otherwise limit EE measure procurement and application.

Technology assessments will also contribute to increased and improved technology supply, leading to further reductions in market barriers, increased intent to purchase/employ measures, and more EE rebates issued. Over time, they will support increasing use of measures by customers, aiding EE programs in achieving energy and demand savings targets, and meeting long term Strategic Plan and policy objectives.

2. **Scaled Field Placements** – (2013-2014: no longer a sub-program, but considered one of many possible "elements" to support Subprogram #3, Technology Introduction Support. Please see Table 2).
   a. These projects consist of placing a number of measures at customer sites as a key step to gain market traction and possibly gain market information. The measures will typically have already undergone an assessment or similar evaluation to reduce risk of failure. While the number of units in scaled field placements will vary widely, numbers typically larger than in an assessment of the technology are expected. A very simple example of a scaled field placement is to give 50 office managers an LED task light. Monitoring activities on each scaled field placement will be determined, as appropriate.

   b. Rationale
   Scaled field placements work under the premise that end-users or stakeholders with adoption influence (installers, builders, procurement officers) will be positively influenced by first-hand experience utilizing a measure and that this first-hand experience will lead to future measure purchases/use. This method of influence is fundamentally different from assessments that influence through information dissemination via a report or other results media.

   Scaled field placements will be most effective when:
   - The stakeholder gaining exposure has the potential to influence a large number of future purchases/uses. Example: Placing a high-efficiency air conditioning unit with several large HVAC contractors. "Potential to influence" is a broad term. Influence of the participant stakeholder could stem

from purchase decision power, high frequency of interactions with other potential adopters, or status as a thought leader; and

- First-hand experience is projected to be more influential for a measure than less costly dissemination mechanisms such as printed information or media. Technology complexity and concern regarding human factors are potential causes for first-hand experience to be more influential than printed media. Example: Placing energy efficient retail lighting at a Wal-Mart, Target, and Home Depot store.

c. Barriers addressed
Scaled field placements address Information or search costs, performance uncertainties, organizational practice or customs, as well as contributing to efforts by others to overcome hidden costs and asymmetric information and opportunism. For instance, scaled field placements reduce the time that large-scale decision makers and decision influencers must spend looking for and confirming the performance of EE measures – as first-hand experience eliminates these needs.

d. Expected outcomes
Scaled field placements will contribute to increased measure awareness, market knowledge and reduced performance uncertainties for ETP stakeholders and large scale customer decision makers and decision influencers. This will lead to changes in organizational practices and customs that may otherwise limit EE measure procurement and application.

Scaled field placements can also contribute to a market tipping point, in which an influential buyer or decision maker responsible for large volume purchase decides to specify the EE measure – thus creating a spike in market demand and exposure for many people who experience the measure once it is implemented. Over time, scaled field placements may support increasing use of measures by customers, aiding EE programs in achieving energy and demand savings targets, and meeting long term Strategic Plan and policy objectives.

3. **Demonstration Showcases –** (2013-2014: no longer a sub-program, but considered a "elements" that can support multiple sub-programs as needed. Please see Table 2).
   a. These possibly large-scale projects will expose measures to various stakeholders utilizing *in situ*, real-world applications and installations. Monitoring activities on demonstration showcases will be determined, as appropriate. For instance, a demonstration showcase for ZNE residential or commercial new construction or for a ZNE existing building could take a form similar to projects performed as part of the Advanced Customer Technology Test for Maximum Energy Efficiency (ACT2) project in California 1990, creating broad public and technical community exposure. Another example would be a demonstration showcase residential or commercial building highlighting LED lighting technologies to create visibility and market awareness for building contractors, architects, and electricians.

Key attributes of a demonstration showcase is that it is open to the public or to an interest group (for example, a super-low energy data center that is open to data center industry professionals), that many viewers are encouraged to visit, and that may highlight a systems approach rather than an individual measure (this last point is optional, as in the case of the previously cited LED lighting showcase). The actual number of customers or viewers exposed to the showcase will depend on the technologies being demonstrated, market segment and other variables.

b. Rationale

Demonstration showcases provide a unique opportunity for measures and systems to receive broad exposure, and for numerous visitors to "kick the tires," or at least experience the measure in an informal, real-world setting.

The combination of large numbers of customers and other stakeholders experiencing the measure with the opportunity to return to the showcase with friends, family, and professional associates, creates a powerful "conversion" experience that enhances diffusion and market penetration. Note that this is very different from the experience of being marketed to or being sold the measure in a purchasing environment.

c. Barriers addressed

Demonstration showcases address information or search costs, performance uncertainties, organizational practice or customs, as well as contributing to efforts by others to overcome hidden costs and asymmetric information and opportunism.

For instance, demonstration showcases reduce the time that IOU customers must spend looking for and confirming the performance of EE measures – either directly, when the customer visits the demonstration showcase site, or indirectly, when the customer receives educational or marketing material through word-of-mouth or EE channels.

Similarly, in-person exposure, word-of-mouth, media or ETP / EE communications on demonstration showcase features, performance, and impressions will assist representatives of companies, departments, and governmental entities in gauging EE measures' actual performance thereby breaking down barriers to proactive implementation.

d. Expected outcomes

Demonstration showcases will contribute to increased measure awareness, market knowledge and reduced performance uncertainties for ETP stakeholders and IOU customers. This will lead to changes in organizational practices and customs that may otherwise limit EE measure procurement and application.

Demonstration showcases, like scaled field placements, can contribute to a market tipping point, in which one or more influential "connectors" or "mavens" experiences and recommends the EE measure to many friends and colleagues – thus creating a spike in market demand and exposure for many more people who experience the measure once it is implemented. Over time, they will support increasing use of measures by customers, aiding EE programs in achieving energy

and demand savings targets, and meeting long-term Strategic Plan and policy objective.

4. **Market and Behavioral Studies** – (2013-2014: no longer a sub-program, but considered a "element" that can support multiple sub-programs as needed. Please see Table 2).
   a. These projects involve targeted research on customer behavior, decision making, and market behavior to gain a qualitative and quantitative understanding of customer perceptions, customer acceptance of new measures, and market readiness and potential for new measures.

      Studies may involve primary research, such as studies of potential measure impacts and barriers, market segment needs and gaps, technology performance gaps, pre-studies to qualify potential measures and sites for scaled field placements and demonstration showcases, measure usability studies, long-term market potential studies for the ETP, and the like.

      Specific examples of primary market and behavioral research include:
      - User feedback gathered on high-efficiency HVAC units at big-box stores;
      - Ethnographic studies to see how automated building system diagnostic applications would fit into daily operations at customer site;
      - Lab-based observational studies of user behavior while using LED task lighting under controlled conditions;
      - Usability studies for home energy monitoring and control systems; and
      - Survey-based discrete choice analysis of features that customers prefer in high-efficiency appliances or industrial process controls.

      Studies may also include secondary research based on the wealth of studies being conducted in the rapidly growing energy behavior field.

   b. <u>Rationale</u>
      Measure adoption is often impacted by customer/market perception and acceptance. Market and behavioral analysis may identify potential barriers to adoption early in the process. Results can provide crucial insights at multiple points in technology development, assessment justification, and transfer to and deployment by EE programs. Additionally, market and behavioral studies may be executed independently of a specific measure where this information is valuable to identify new markets or segment opportunities, or to advance one or more of the ETP objectives in other ways.

   c. <u>Barriers addressed</u>
      Market and behavioral studies address information or search costs, performance uncertainties, organizational practice or customs, as well as contributing to efforts by others to overcome hidden costs and asymmetric information and opportunism. For instance, market and behavioral study reports reduce the time that IOU customers must spend looking for and confirming the human factors performance aspects of EE measures – either directly, when the customer reads the ETP report,

or indirectly, when the customer receives educational or marketing materials through EE channels based on ETP market and behavioral study findings.

Similarly, ETP communications about market and behavioral studies for measures that are being transferred or have been transferred to EE programs will assist companies, departments, and governmental entities in understanding EE measures' actual performance, including human factors, breaking down barriers to proactive implementation. They can also help product developers and manufacturers identify and target unmet customer needs, thus enabling development and deployment of new or better products, such as efficient consumer electronics or CFLs that better meet customer expectations.

d. Expected outcomes
Market and behavioral studies will contribute to increased measure awareness, market knowledge and reduced performance uncertainties for ETP stakeholders and IOU customers. This will lead to changes in organizational practices and customs that may otherwise limit EE measure procurement and application. Market and behavioral studies will also contribute to increased and improved technology supply leading to further reductions in market barriers, increased intent to purchase/employ measures, and more EE rebates issued. Over time, they will support increasing use of measures by customers, aiding EE programs in achieving energy and demand savings targets, and meeting long term Strategic Plan and policy objectives.

5. **Technology Development Support** – (2013-2014: Merged into Subprogram #1, see Table 2)
   a. The ETP will look for targeted opportunities to support energy efficiency product development. Product development is the process of taking an early-stage technology or concept and transforming it into a saleable product. (Early-stage technologies are often the output of R&D work, hence product development bridges the gap between R&D and the market.) An example of an early-stage technology is a light-emitting diode. The product development process has resulted in televisions, computer monitors, illuminated signs, and lighting fixtures.

   b. Rationale
   Product development is best performed by private industry. There are opportunities, however, where the IOUs are well qualified or in a strong position to undertake targeted, cost-effective activities which provide value in support of private industry product development efforts. (Examples of activities include providing customer contacts for field evaluations, making lab testing facilities available to companies without this capability, or developing standard testing protocols. See Section 5, Goal #2, Objective 2.1 for a complete description of potential opportunities.) California has a vested interest in seeing EE products create positive impressions on consumers in the areas of performance and quality, as consumers may project a poor experience with one EE measure onto other EE measures. Technology development support can aid these efforts. As private

industry is generally best positioned to perform product development, it is important during the screening process to establish the incremental value-added of these ETP activities for these opportunities. Attributes of potential opportunities which would lead to ET / IOU efforts being most necessary, cost-effective, and/or impactful are as follows:

- Issuing rebates or setting rebate program requirements.
- A cost (capital, labor, or expense), the resulting benefit of which would be shared by multiple stakeholders. (Example: making certain expensive pieces of equipment available to test targeted technologies in development by small companies.);
- An investment of funds or resources, said investment being justified from the perspective of the ET mission, but being unattractive when viewed by a single technology developer. (Example: developing a hot-dry AC testing protocol.); and
- Knowledge, equipment, information, or facilities that are very specific to the business of the IOU and may not be easily attainable by private industry without the IOU help. (Example: non-private IOU customer data.)

c. Barriers addressed

Technology development support focuses primarily on product or service unavailability. it also helps overcome organizational practices or customs by guiding a new measure to market that is tailored to specific segment or business needs. Finally, it may address Hidden Costs, a secondary market barrier for ETP, by assisting in development of a measure that minimizes maintenance or installation costs that would otherwise hamper adoption.

d. Expected outcomes

Technology development support will contribute to increased readiness and availability of EE measures for customers and EE program managers and reduced uncertainties for program participants. It also contributes to engagement in product development decision-making by ETP stakeholders and large-scale customer decision makers and decision influencers. This will lead to changes in organizational practices and customs and can lead to reduced maintenance and installation costs that may otherwise limit EE measure procurement and application.

The increased and improved technology supply, due to technology development support, will also lead to further reductions in market barriers, increased intent to purchase/employ measures, and more EE rebates issued. Over time, this will support increasing use of measures by customers, aiding EE programs in achieving energy and demand savings targets, and meeting long term Strategic Plan and policy objectives.

6. **Business Incubation Support -** (2013-2014: no longer a sub-program, but considered a "element" that can supports all sub-programs as needed; please see Table 2).
   a. Technology Resource Innovation Outreach (TRIO) is a statewide program that focuses on providing training and networking for entrepreneurs and companies providing energy saving technologies.

   b. Rationale
   During a solicitation process review by the PRG, it was mentioned that the utilities need to generate new innovative program ideas "through more outreach and non-traditional methods." In response to this request, more outreach was conducted via investor forums, university settings, and solicited abstracts. Venture capitalists (VC) were notified of the potential TRIO program and were very interested in technologies that had a utility interest. The VCs were interested in learning how to do business with the utilities, what the utilities expected from entrepreneurs, how to utilize the utility emerging technologies department, and how to go about obtaining a purchase order with an IOU.

   From this research the IOUs concluded that more outreach and non-traditional methods to generate new ideas could be generated by providing training workshops and mentoring on participating in IOU programs and the IDSM business environment.
   TRIO is designed to accelerate the successful development of technologies through an array of engineering support, resources and services, developed and orchestrated by TRIO and offered both through TRIO and its network of contacts. There will be significant coordination with existing clean tech programs (such as the California Cleantech Open and various clean tech business clusters throughout California).

   c. Barriers addressed
   Business incubation support focuses primarily on product or service unavailability. It supports and accelerates market introduction for new measures (increased technology supply), and a particular form of information and search costs for businesses seeking to obtain recognition in IOU incentive and educational programs, as part of their business model. It also helps overcome organizational practices or customs by guiding new measures to market that are tailored to specific segment or business needs.

   d. Expected outcome
   Business incubation support will engender improved understanding of utility programs, as well as technology and business performance and market requirements for small entrepreneurs or large enterprises seeking to develop and/or introduce new EE and DR measures successfully into the market. It will reduce uncertainties for program participants, increase the readiness and availability of EE and DR measures, and increase participation in TRIP solicitations as well as in EE and DR incentive and education programs.

Business outreach support will also contribute to increased and improved technology supply over the mid- and long-term, leading to reductions in other market barriers, increased intent to purchase/employ measures, and more EE rebates issued. Over time, it will support increasing use of measures by customers, aiding EE or IDSM programs in achieving energy and demand savings targets, and meeting long term Strategic Plan and policy objectives.

**Advancing Strategic Plan goals and objectives**

The ETP fully supports the goals, strategies and near-team plans of the Strategic Plan. This support will be demonstrated through both: a) the types of technologies that are selected for the ETP, and b) the approach that is employed to address longer term goals of the strategic plan by having a well-diversified portfolio of technologies under development, assessment, or deployment.

A key step that the IOUs are taking to increase ETP impact in support of the Strategic Plan is strengthening the linkages and feedback loops between ETP and other EE programs, as well as with leading market actors, to help advance development and implementation of new measures that support the Strategic Plan goals and strategies for Research and Technology, the Big, Bold initiatives, and related solutions, such as advanced lighting measures.

These linkages and feedback loops incorporate key EE, IDSM, and other IOU competencies such as EM&V, market research, behavioral, and potential studies, marketing, training, and regulatory support to ensure the deployment of new measures supporting the Strategic Plan will receive the full benefits of the IOUs' enterprise-wide resources.

The ETP organizational linkages and feedback loops will ensure a more cohesive approach to delivery of emerging technology products that in turn will lead to greater success in measure introduction, market adoption, and the overarching goal of energy savings. These linkages and feedback loops are further described in Section 6, below.

Furthermore in support of the Strategic Plan's goals and pursuant to the 2013-2014 guidance decision, the HVAC's Technologies and System Diagnostics Advocacy (HTSDA) 2010-2012 activities will be incorporated into ETP's goals and objectives.

The vision is to make a difference in the HVAC industry by addressing equipment reliability, performance, and integration/application challenges, in alignment with California's energy policies (i.e., California's Strategic Plan and SCE's goals). These efforts will ensure that residential and light commercial HVAC technologies, installations, and maintenance practices are of the highest quality, and optimized for California's varying climates. These efforts are focused on coordination and advocacy that addresses the priority need for immediate and comprehensive action addressing elements critical to increasing, optimizing and maintaining the energy and peak electricity efficiency performance of direct expansion (DX)/vapor-compression–based cooling equipment and accelerating the market introduction of a range of advanced evaporative-based climate appropriate cooling technologies as well as.

Research/advocacy supporting automated fault detection and diagnostic maintenance procedures. Efforts includes unprecedented participation by HVAC industry stakeholders in research, development, and design, continuous review and updating, and operation of HVAC-related IOU programs. This unprecedented cooperation and collaboration with the HVAC industry has the purpose of substantially advancing HVAC-related program quality and effectiveness.

**5. Program Goals, Objectives, Action Strategies & Performance Metrics**

ETP operations will apply the three sub-programs described in Section 4 to achieve the ETP goals, objectives, and action strategies.

- ETP Subprogram 1 - Technology Development Support
- ETP Subprogram 2 - Technology Assessments
- ETP Subprogram 3 - Technology Introduction Support

Each ETP sub-program corresponds to one of the three ETP goals. In high-level terms, the ETP goals are to increase adoption of measures (market demand), to increase measure supply (technology supply), and to advance Strategic Plan Big, Bold initiatives and related integrated energy solutions. These approaches are complementary and reinforce each other by helping new measures become available in the market and gain stronger market traction sooner than otherwise possible. Collectively, they coordinate with other EE programs and with interventions by non-utility market actors to market transformation efforts aimed at increasing the adoption of EE measures in California, nationwide and internationally.

Actions that increase market demand make developing and launching new measures less expensive, less risky, and generally more attractive to manufacturers and vendors seeking to increase sales and profitability. This increased market demand inherently drives increased technology supply.

Actions that increase technology supply by resulting in more high-quality EE measures in the market encourage existing entrepreneurs and attract new ones to form or join enterprises in the EE market. These actions also attract progressive policy makers, consumers seeking financial and intangible benefits, and investors and others willing to fund innovative measures. This increased technology supply inherently drives increased market demand.

Actions supporting Strategic Plan Big, Bold initiatives and related solutions combine market demand and technology supply approaches. All actors involved in creating technology supply and market demand benefit from interventions by the ETP and complementary efforts.

**ETP Goal #2 (2013-2014 Goal #2: Increased number of measures offered by EE programs)**
Contribute to EE/DR market transformation efforts by accelerating stakeholder adoption of measures through transfer of available ETP measures into IOU EE programs or through other implementation channels. The focus of this Goal is increased market demand.

**Objective 2.1: Perform Technology Assessments**
During the 2013-2014 funding cycle, assess EE measures, including integrated demand-side management (IDSM) measures as defined by the EE Policy Manual[1].

**Action Strategy 2.1.1a:** Scan a wide variety of sources for measures that could help IOUs meet customer needs and achieve energy savings, demand reduction, and other IDSM targets. Following are representative measures for ETP scanning in 2013-2014.

**Lighting**

| |
|---|
| Task/ambient lighting designs |
| LED/SSL lighting applications (internal, external) |
| Dual relay occupancy sensor |
| Self commissioning dual loop daylight harvesting |
| Simplified daylight and occupancy controls |
| HID electronic ballasts |
| LED fixtures and systems |
| Dimmers for CFLs and LEDs |
| Super CFL |
| Small HID |
| Smart occupancy sensor systems |
| Solid state street lights |
| Plasma lighting |

**HVAC**

| |
|---|
| Climate Appropriate Technologies |
| Automated Fault Detection & Diagnostics |
| Retrofit technologies |
| Behavioral studies |
| Quality Maintenance |
| Adiabatic cooling |
| Geothermal heat pumps |
| Natural gas driven heat pumps |
| Electric heat pumps |

**Other**

| |
|---|
| Industrial process technologies |
| Advanced gas water heating technologies |
| Super Boiler |

[1] ETP assessments are expected to complete in or before the fourth year after the year in which the assessment is initiated. This window may go well beyond the 2013-2014 funding cycle, especially for ETP assessments initiated in 2014. 2013-2014 funding cycle expenditures will occur throughout the project, meaning that some ETP expenditures could extend through 2018.

| |
|---|
| Consumer and commercial electronics |
| Plug loads and associated technologies |
| Energy Management Systems (all sectors including residential) |
| AMI/HAN integrated technologies |
| Data center technologies (air handling and hardware) |

**Action Strategy 2.1.1b:** Review national and state priorities for HVAC technologies as part of the scanning efforts. The statewide HVAC program plans within the Residential and Commercial Programs program outline a process around HVAC program design, implementation, technology assessment, ETP, and codes & standards. The framework includes an engaged industry stakeholder collaboration group, the Western HVAC Performance Alliance (WHPA), IOU HVAC Management team that includes participation from HVAC program/ETP/Codes & Standards managers, and the Western Cooling Efficiency Center (WCEC).

**Action Strategy 2.1.1c:** Coordinate with statewide lighting initiatives (including the CLTC, state regulatory organizations, and other key stakeholders) to receive input to the scanning process.

> **Output for Action Strategy 2.1.1:** ET scanning will provide broad technology and market knowledge as a precursor to the ETP screening process.

**Action Strategy 2.1.2:** Execute a screening process for assessment candidates designed to ensure that the ET team most effectively focuses its time and resources on measures. Utilize the Residential and Commercial HVAC subprograms and statewide lighting initiatives as resources for providing information utilized in the screening process.

> **Output for Action Strategy 2.1.2:** The ET screening process will produce a list of scored, approved, and funded measures for assessment. Ideas that pass the screening criteria will proceed to the next step of the ET process.

**Action Strategy 2.1.3:** Conduct ET assessments to evaluate performance uncertainties and/or other attributes potential effectiveness / impact in reducing energy consumption and peak demand of new and/or under-utilized measures.

> **Output for Action Strategy 2.1.3:** The ETP will produce a report describing results and conclusions from each ETP assessment. Ideas that pass the assessment criteria will proceed to the next step of the ET process.

**Action Strategy 2.1.4:** Develop and maintain a project tracking database containing the variables and attributes to be tracked by all ETCC programs statewide, and data will be reported to the CPUC on a regular basis. The naming convention shown in Appendix 3 will be used by all parties for tracking assessments.

> **Output for Action Strategy 2.1.4:** The ETP will update the CPUC database quarterly.

**Action Strategy 2.1.5: (SCE Only)** Maintain testing capability to support technology assessments.

> **Output for Action Strategy 2.1.6: (SCE Only)** ETP will contribute to maintenance of existing TTC facilities. All test facilities will have sufficient technical capability and intellectual capital to assess technologies.

**Action Strategy 2.1.6:** In addition, ETCC will host input sessions (Open Forum) to promote exchange of knowledge, perspectives and ideas two times per year. Like the ET Summit, these sessions will be organized by the ETCC and will be separate from quarterly ETCC business meetings. Increased access to ideas from outside organizations and entities will help the ETP maximize innovation and energy savings.

> **Output for Action Strategy 2.1.6:** Minutes capturing assessment suggestions will be recorded for each session and used as an input to the scanning process.

**Objective 2.2: Transfer Measures into EE Programs**

During the 2013-2014 funding cycle, transfer measures from the ETP into the EE programs, with the goal of producing energy savings and/or demand reduction.
Transfers may include measures from assessments initiated or completed in previous ETP cycles, as well as those from the current 2013-2014 program cycle.

**Action Strategy 2.2.1:** Evaluate program activity to assess the market acceptance two years, and potentially three years, after the launch of a measure transferred from ET. Review these findings with EE Program staff regarding potential improvement to both ET and EE program activities.

> **Output for Action Strategy 2.2.1:** The ETP will track EE program activity for measures assessed in the ET program.

**Action Strategy 2.2.2:** The ETP will provide information to internal stakeholders from assessments that could help IOU's IDSM resource acquisition programs create new measures, or revise/integrate existing measures, that increase energy savings in a variety of market sectors. Specific activities will include ensuring final reports are distributed and made available, discussing results with EE program managers and IDSM clients, and assisting with communications and program documentation, as needed.

> **Output for Action Strategy 2.2.2:** Internal stakeholders will receive ETP final reports, discussion of ETP results, and other communication and documentation when relevant.

**Action Strategy 2.2.3:** Communicate information on high-potential ET assessment findings to external stakeholders. Consult with internal and external partners to determine appropriate outreach activities for select specific measures. Possible outreach activities include:

- Post reports and results on the ETCC website;

- Debrief assessments partners on findings through a meeting, memo, or podcast;
- Execute public relations efforts, such as development and dissemination of press releases and articles for trade publications;
- Present findings at industry and community meetings/conferences, with a focus on promoting IDSM efforts;
- Submit articles to industry publications;
- Provide technical information to, and support information dissemination by the energy centers operated by each of the IOUs;
- Meet with market actors, including technology owners, manufacturers, allies, channel partners, trade association members, utilities, investors, and technology developers; and
- Utilize the bi-annual ET Summit Conference as a forum to communicate assessment results.

> **Output for Action Strategy 2.2.3:** The ETP will post reports and results on the ETCC web site (http://www.etcc-ca.com) when the results/findings are appropriate for external dissemination. Due to high tracking costs, some line item outreach activities in Action Strategy 1.2.3 are not mentioned here.

**Action Strategy 2.2.4:** Proactively serve as subject matter experts and advisors to EE and IDSM program managers. Support transfer and development of EE measures based on assessments and market and behavioral studies. Coordinate with EE programs and other IOU resources needed for successful EE measure roll-out.

> **Output for Action Strategy 2.2.4:** Increased EE program manager knowledge and understanding.

**Action Strategy 2.2.5:** Conduct research for EE measures in accordance with guidance decision to support the development of energy savings ex-ante values

> **Output for Action Strategy 2.2.5:** Increased number of measures in the EE portfolio.

**ETP Goal #3:** Support technology introduction and whole-building deep-energy reduction strategies.

The action strategies used in these projects may include but are not limited to scaled field placements, demonstrations, and/or showcases. The specific action strategy for each project will be specified in each project's plan.

**Objective 3.1: Conduct field deployments (**2013-2014: Changed to a element in support of ETP Goal#3)
Conduct scaled field placements during the program period to increase market understanding[2] and traction for new and under-utilized measures[3].

**Action Strategy 3.1.1:** Scan a wide variety of sources for measures for scaled field placements that could help IOUs to increase market understanding and traction for new and under-utilized measures.

> **Output for Action Strategy 3.1.1:** ET scanning will provide broad technology and market knowledge as a precursor to the ETP screening process to identify opportunities for scaled field placements.

**Action Strategy 3.1.2:** Execute a screening process for scaled field placements candidates designed to ensure that the ET team focuses its time and resources on measures most effectively.

> **Output for Action Strategy 3.1.2:** The ET screening process will produce a list of scored, approved, and funded measures for scaled field placements. Ideas that pass the screening criteria will proceed to the next step of the ET process (Action Strategy 1.3.3)

**Action Strategy 3.1.3:** Conduct scaled field placements to increase market acceptance and traction for new and under-utilized measures[4].

> **Output for Action Strategy 3.1.3:** At a minimum, the following data will be tracked for each scaled field placement: documents supporting the funding decision, number of measures installed, and EE program activity for programs where the installed measures would qualify.

**Action Strategy 3.1.4:** Evaluate program activity to assess the market acceptance at one year and two years, and potentially at three years after the launch of a scaled field placement. Review these findings with EE Program staff regarding potential improvement to both ET and EE program activities.

> **Output for Action Strategy 3.1.4:** The ETP will track EE program activity for EE measures utilized in scaled field placements.

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[2] It should be noted that unlike assessments, the primary information dissemination mechanism for scaled field placements is first hand experience utilizing the measure.

[3] ETP scaled field placements are expected to complete in or before the fourth year after the year in which the scaled field placement is initiated. Therefore, expenditures for scaled placements initiated and funded for the 2013-2014 program cycle may be incurred through 2018.

[4] Note: Measures in scaled field placements will almost exclusively be measures already included in EE programs or a measure that has undergone technology assessment.

**Objective 3.2: Conduct technology demonstrations (2013-2014: Changed to a element that can be used to support more than one ETP Goal)** Conduct IOU demonstrations and showcases to expose stakeholders to the performance of measures or systems. Highlight real-world applications and installations for market actors and end users[5,6]. An example of these projects could include supporting the construction of a high-performance residential building to demonstrate how multiple measures integrate to deliver near-ZNE performance.

**Action Strategy 3.2.1:** Scan a wide variety of sources for measures for demonstration showcases that could expose technology to various stakeholders and demonstrate technology performance and applicability in real world applications.

**Output for Action Strategy 3.2.1:** ET scanning will provide broad technology and market knowledge as a precursor to the ETP screening process to identify opportunities for demonstration showcases.

**Action Strategy 3.2.2:** Execute a screening process for demonstration showcases candidates designed to ensure that the ET team most effectively focuses its time and resources on measures.

**Output for Action Strategy 3.2.2:** The ET screening process will produce a list of scored, approved, and funded measures for demonstration showcases. Ideas that pass the screening criteria will proceed to the next step of the ET process (Action Strategy 1.4.3)

**Action Strategy 3.2.3:** Conduct demonstration showcases to expose technology to various stakeholders and to demonstrate technology performance and applicability in real world applications.

**Output for Action Strategy 3.2.3:** At a minimum, the following data will be tracked for each demonstration showcase: documents supporting the funding decision, location of installed measures, and any available data regarding people who viewed/attended/participated.

**ETP Objective 3.3:** Conduct Technology Resource Innovation Program (TRIP) Solicitations.

**Action Strategy 3.3.1** TRIP will solicit a competitive bidding process to fund third party programs that leverage innovative EE and/or IDSM technologies and approaches. The awarded TRIP Programs will be transferred and administered by the utility's EE third

[5] It should be noted that unlike assessments, the primary information dissemination mechanism for demonstration showcases is first hand exposure to the measure.

[6] ETP Demonstration Showcases are expected to complete in or before the fourth year after the year in which the Demonstration Showcase is initiated. Therefore, expenditures for demonstration showcases initiated and funded for the 2013-2014 program cycle may be incurred through 2018.

party portfolio group. TRIP Programs will follow standard third party policies and procedures. For these details, please see the Third Party Program Implementation Plans.

> **Output for Objective 3.3.1:** TRIP will solicit and award new third party programs.

**Market and Behavioral Studies:** (2013-2014: Changed to a element that can be used to support all ETP Goals) Perform targeted studies of customer behavior, decision making, and market behavior to gain understanding of customer/market perception and acceptance, and to identify potential barriers to measure adoption.

Perform primary IDSM related market and behavioral studies to enhance market intelligence of customer needs and "decision triggers" to improve acceptance of new or under-utilized energy efficiency technology.

All market and behavioral studies will be captured in a final report.

Review and analyze secondary research as found, for example, from IOU subscription market research services such as E Source and Energy Insights, and from such organizations as Energy Information Administration, National Technical Information Services, and CALMAC, as well as in reports such as the Residential Appliance Saturation Survey and Commercial End-Use Survey.

Secondary research findings will be captured in a final report.

Conduct the following types of studies:

- Perform market research studies to assess the potential impact of and barriers to implementation of proposed measures;
- Investigate specific technology gaps for a given market segment;
- Conduct an Energy Technologies/RD&D gap analysis for agricultural EE as included in the Strategic Plan; Identify and prioritize needed RD&D/ET projects;
- Perform customer research to assess the need for and optimal design of scaled field placements and demonstration showcases;
- Perform usability studies to assess how easily customers can adapt to and benefit from new measures; For instance, in-home monitoring and display technologies;
- Perform a scoping study, including findings from the Commission's potential and goals studies, of the overall long-term market potential for Emerging Technologies with estimates on targeted technologies and systems;
- Perform customer research to identify approaches to making new measures more attractive to customers;
- Perform customer research on the potential impact of social network software and other behavioral tools in expanding the impact of EE programs; and
- Perform market research to identify approaches for accelerating the pace of deployment of new EE and IDSM measures and programs.
- Develop roadmaps in accordance with 2013-2014 portfolio guidance decision.
- Produce reports summarizing study findings.

- Develop residential and commercial roadmaps that encompass existing building retrofit and new construction programs by the end of the fourth quarter of 2013, in preparation for their inclusion in their 2015 and later energy efficiency portfolios.
- Ensure collaboration with Energy Division staff and other EE programs for the development of the scope for these roadmaps.
- Disseminate market and behavioral reports.
- Post all market and behavioral reports on ETCC web site, where results/findings are appropriate for dissemination.

**ETP Goal #1: Increased EE Technology Supply**

Contribute to EE/DR market transformation efforts by assisting technology developers and manufacturers to create technology supply with respect to emerging technologies, including supply for the Big Bold Initiatives, thereby increasing the number of EE measures that are available for adoption. The focus of this Goal is increased technology supply.

**Objective 1.1 Support technology development**
During the **2013-2014** program cycle, the ETP will screen, select, and implement targeted technology development support projects to benefit EE product development.

**Action Strategy 1.1.1:** Identify targeted opportunities to develop forward looking product specifications which could be used by a multitude of product developers. This effort could be most effective if the opportunity exists to tie future rebates or other incentives to the specifications. This may include development of an open source or proprietary product specification for entrepreneurs to build to – possibly with incentives. This may also contribute to competitions to develop new product concepts/meet specifications.

**Output for Action Strategy 1.1.1:** Produce open source or proprietary specifications.

**Action Strategy 1.1.2:** Look for targeted opportunities to establish product baseline performance levels. As an independent entity, the utilities may be in a position to establish baseline performance levels. This baseline information would serve as an input to product development efforts. Often, it is expensive and time consuming for developers to establish baseline performance in a product segment.

**Output for Action Strategy 1.1.2:** Distribute baseline performance level reports to targeted product developers and partner entities.

**Action Strategy 1.1.3:** Look for targeted opportunities to develop standard test protocols for energy efficient products, in support of statewide Codes & Standards Program.

**Output for Action Strategy 1.1.3:** Develop and disseminate standard EE product test protocols in conjunction with statewide Codes & Standards Program.

**Action strategy 1.1.4:** Look for targeted opportunities to provide customer contacts for testing and focus groups. Utilities may be in a unique position to help connect product developers with customers willing to participate in field tests of measures and provide feedback.

**Output for Action Strategy 1.1.4:** A list of customers who have agreed to have their contact information shared with a technology developer.

**Action strategy 1.1.5:** Look for targeted opportunities to conduct market or behavioral studies and otherwise provide and/or collect market intelligence. Utilities may have access to or the ability to collect market intelligence that would help justify product development investment and guide product development targets.

**Output for Action Strategy 1.1.5:** Any market or behavioral studies will be captured in a final report.

**Action strategy 1.1.6:** Look for targeted opportunities to make expertise/knowledgeable personnel available as resources to product developers. Utilities may be in a position to advise on certain subject matter.

**Output for Action Strategy 1.1.6:** Produce an activity report for time charges incurred by ETP, while providing support to product developers.

**Action Strategy 1.1.7:** Look for targeted opportunities to make testing facilities and/or other infrastructure available to multiple product developers. Utilities may be in a position to facilitate the sharing of capital intensive testing facilities or other infrastructure across parties developing energy-efficient products. Often, these resources serve as a barrier to product development or as a barrier to product quality and performance success.

**Output for Action Strategy 1.1.7:** Produce an activity report for testing and other infrastructure support provided to product developers

**Objective 1.2. Conduct technology developer outreach through TRIO**

Incubate businesses developing or selling EE or DR measures. TRIO focuses on providing training and networking for entrepreneurs and companies providing energy saving technologies. This will include providing training workshops and mentoring on participating in IOU programs and the IDSM business environment. More detailed information regarding the TRIO efforts are included in Section 8 of this PIP.

**(2013-2014: Incorporated into the project selection criteria for each Sub-program)**
Support achievement of the Strategic Plan Big, Bold initiatives for ZNE New Residential Construction, ZNE New Commercial Construction, ZNE for Existing Buildings, HVAC Industry and Market Transformation, and related solutions, such as advanced lighting

measures, through programs and initiatives aimed at each. As the Strategic Plan is prominent in the activities of the ETP, a significant portion of the efforts undertaken towards goals 1 and 2 will contribute towards goal 3.

**(2013-2014: Incorporated into the project selection criteria for each Sub-program)**
Help advance innovative measures and/or strategies to support ZNE New Residential Construction, ZNE New Commercial Construction, ZNE for Existing Buildings, HVAC Industry and Market Transformation, and related solutions during 2013-2014.

**(2013-2014: Incorporated into the project selection criteria for each Sub-program)**
Scan, screen and execute emerging technology projects in the areas of assessments, scaled field placements, demonstration showcases, market and behavioral studies, and/or technology development support to support ZNE New Residential Construction, ZNE New Commercial Construction, ZNE for Existing Buildings, HVAC Industry and Market Transformation, and related solutions during 2013-2014. (Projects in this action strategy will be considered to fulfill objectives in multiple Goals where relevant.)

**(2013-2014: Incorporated into the project selection criteria for each Sub-program)**
Outputs for these projects would be as stated for the corresponding projects under goals 1 and 2.

**(2013-2014: Incorporated into the project selection criteria for each Sub-program)**
SCE's TTC is a resource that provides state-of-the-art testing facilities for conducting ETP projects and evaluating new IDSM technologies in support of the Strategic Plan's Big, Bold initiatives.

The TTC will maintain testing capabilities to specifically support the Big, Bold ZNE and HVAC initiatives. Additional important end uses, including lighting and refrigeration, will be the focus of distinct TTC test facilities.
More detailed information regarding the TTC efforts are included in Section 8 of this PIP.

**Numerical Deliverables**
The 2013-2014 ETP brings an expanded set of tools to the complex task of supporting Strategic Plan's goals, while assisting EE and IDSM programs in achieving maximum impact. As certain objectives involve activities that are new to the ETP, there is some degree of inherent uncertainty with regards to numerical deliverable levels. (An example of a numerical deliverable is "Conduct Technology Introduction Projects")

To account for this inherent uncertainty, while allowing the use of numerical deliverables, the ETP may need to substitute additional assessments in place of other program deliverables, if necessary, in order to meet numerical deliverable levels described in the Table 4. For instance, if projections for a demonstration showcase for an "Office of the Future" are significantly more costly than anticipated, the ETP may substitute one or more technology assessments to assure a successful, timely, and cost-effective outcome from all objectives that contribute to the ETP Goals.

**Table 4. 2013-2014 Numerical Goals**

| 2013-2014 Subprogram | Objective | Cycle Numeric Goal |
|---|---|---|
| Sub-program #1 Technology Development Support Subprogram | Screen, select, and implement targeted technology development support projects to benefit EE measure development. | 18 |
| | Conduct technology developer outreach through workshops | 2 |
| Sub-program #2 Technology Assessments Subprogram | Assess EE measures, including integrated demand-side management (IDSM) measures | 34 |
| | Transfer measures from the ETP into the EE programs, with the goal of producing energy savings and/or demand reduction. | 10 |
| Sub-program #3 Technology Introduction Support Subprogram | Conduct technology introduction activities | 6 |
| | Conduct Technology Resource Innovation Program (TRIP) Solicitations | 3 |

**Program Performance Metrics (PPMs)**

On December 2, 2010, the Commission issued Resolution E-4385, approving Program Performance Metrics (PPMs) for Pacific Gas and Electric Company, Southern California Edison Company, Southern California Gas Company and San Diego Gas and Electric Company for 2010-2012 statewide energy efficiency programs and subprograms. The Commission gave each PPM a metric type which indicated the reporting frequency: Metric type 2a indicates that the IOUs should report on the metric on an annual basis (unless indicated otherwise) Metric type 2b indicates the IOUs should report on the metric at the end of the program cycle.

Table 5 below lists the approved PPMs and metric types for the Emerging Technologies Program (Resolution E-4385, Appendix A, pp. 39-40):

NOTE: For 2013-2014, the "elements" have been re-characterized to support more than one ETP Goal.

**Table 5. 2013-2014 Program Performance Metrics**

| EMERGING TECHNOLOGIES (ET) | | |
|---|---|---|
| **Metric Type** | **Description** | **IOU Reporting** |

| | | **Frequency** |
|---|---|---|
| Overall ETP Program | 1. The number of new "proven" ET measures adopted* into the EE Portfolio.<br><br>* "Adoption" means measure is available to end-use customers through IOU programs. Adoption of a measure may be attributed to one or more ET sub-programs | 2b |
| | 2. Potential energy impacts* (energy savings and demand reduction) of the adopted ET measures into the EE portfolio.<br><br>* Potential energy impacts to be reported based on ET project findings and estimated market potential (reported through quarterly ET database updates) | 2b |
| ***Technology Assessment (TA)*** | 1. Number of ETP measures which have undergone TA that are adopted* into the EE portfolio, including but not limited to each of the following:<br>(a) Advance HVAC technologies<br>(b) High efficiency plug loads and appliances<br>(c) Advanced lighting technologies<br><br>* "Adoption" means measure is available to end-use customers through IOU programs. | 2b |
| ***Technology Development Support (TDS)*** | 1. Number of new performance specifications and/or Use Cases* produced as a result of TDS sub-program.<br>* "Use Cases" describe the need for a technology or application. | 2b |
| | 2. Number of new performance specifications and/or Use Cases presented to manufacturers/private industry for possible action.*<br><br>* "Possible action" means that the manufacturer/private industry considered | 2b |

| | | |
|---|---|---|
| | TDS results in their product development efforts. | |
| NEW: Technology Introduction Support | Number of technology introduction support projects initiated. | 2b |

**Market Transformation Indicators (MTIs)**

Per Resolution E-4385, a subset of market transformation indicators (MTIs) for statewide energy efficiency programs and subprograms were presented at a public workshop on November 7, 2011, to allow for public comments and discussion before being finalized. Per Energy Division Guidance on June 19, 2012, the MTIs to be found in Attachment "H" are approved for this sub-program as applicable.

## 6. Coordination and Integration
**IOU coordination efforts are described below**

### 6.1 - ETP Statewide Coordination

A key strength of the ETP is the value created through ongoing collaboration among the statewide IOUs. Continuing and enhancing this statewide collaboration will contribute to the successful accomplishment of the ETP goals and objectives.

**6.1.1 – Leveraging role of the Emerging Technologies Coordinating Council (ETCC):** The ETCC plays a central role in statewide ETP coordination. The ETCC membership consists of the IOUs, the CEC, and CPUC staff. During 2013-2014, the ETCC will meet at least four times per year to coordinate activities, exchange information, and define new and enhanced collaboration strategies.

Discussion at ETCC business meetings may touch on privileged customer information, business strategic and operational details, and privileged manufacturer product details that are too sensitive to discuss in an open forum. For this reason, ETCC business meetings will not be open to the general public.

The ETCC also convenes sub-groups to address statewide ETP collaboration opportunities that require additional time beyond what is available during regular ETCC meetings. For instance, a standing lighting sub-group meets quarterly, and the ETCC will host an upcoming hot, dry air conditioner meeting with the Western Cooling Efficiency Center at UC Davis.

In accordance with 2013-2014 guidance decision, ETCC membership will be expanded to research organization including research universities, national labs, energy centers, and other research organization. A new "collaborative" membership category will be developed. Potential new members will be invited to join.

**6.1.2 – Collaboration with Municipal Utilities:** As over 300 California municipal utilities launch or expand EE efforts, they are becoming increasingly aware of the need for, and potential benefits of, new and under-utilized measures to meet EE program goals. The ETCC is responding by promoting coordination and information sharing between ETCC members and municipal utilities.

This collaboration will include sharing information and results connected with upcoming IOU and CEC market studies, measure assessments, and scaled field placement activities. The IOUs will also provide recommendations to municipal utilities that have their own ET programs or are considering launching ET efforts, and may encourage municipal utility ET program staff to attend quarterly ETCC meetings.

Due to the large number of municipalities, their geographical range and varying stages in EE program development, the ETCC will work with conveners such as the largest and most advanced municipalities (SMUD, LADWP, City of Palo Alto, etc.) and municipality-coordinating entities like the Northern California Power Agency and Southern California Public Power Authority.

**6.1.3 – Forums and Training:** The ETCC will support the Incubation objective under ETP Goal 2 by holding three training sessions every year for researchers to educate them about utility and investor perspectives, challenges, and needs.

**6.1.4 – Knowledge Sharing:** On a strategic level, the statewide ETP is committed to developing and implementing practices and tools to maximize collaboration and integration among the IOU ETPs. This will include comparing ETP local plans and identifying opportunities to reinforce and maximize statewide coordination and integration, keeping in mind the distinct resources, expertise, and customer base for each IOU.

**6.1.5 – Coordination with non-IOU entities:** Finally, the statewide ETP will expand statewide emerging technology projects and projects that leverage funding from non-IOU entities. The IOU ETPs will continue to identify and participate in collaborative projects that are co-funded by federal agencies or other large funders and that meet ETP criteria.

## 6.2 - ETP Coordination with EE Resource & Non-Resource Programs

The ETP maintains crucial touch points with EE resource programs and many non-resource programs, which serve as key clients for the measures that ETP assesses and makes available for implementation. Coordination with these EE programs occurs throughout the ETP screening, selection, assessment, and transfer process.

**6.2.1 – Idea Generation Coordination:** Ideas for new measures often come from EE program staff or through the professional networks of EE staff. At the screening stage, the ETP relies on input from EE program managers to score measures for assessment. EE program staff also plays a key role in identification of host sites for field assessment projection, scaled field placements, and demonstration showcases. The transfer of new measures from the ETP into EE programs takes place through a close collaboration between the programs.

**6.2.2 – Feedback Loop with IOUs and M&V Community:** In 2013-2014, the ETP will expand feedback loops with program staff and M&V consultants to increase the understanding by ETP and EE program staff of impacts from each new measure that has been transferred EE programs, including those that do not achieve projected levels of market penetration, energy savings, or demand reduction.

This will take the form of an initial meeting 12 months after a measure is transferred from ETP to an EE program, with a second meeting 24 months after transfer. An additional follow-up meeting will be scheduled three years after transfer, as needed.

## 6.3 - ETP Coordination with Cross-cutting Programs (Codes & Standards, Statewide M&O, WE&T etc.)

The ETP has a history of productive connections with cross-cutting programs including Codes & Standards and Energy Centers, and has successfully demonstrated that collaboration can maximize the impact achieved by all parties. In addition, SCE's TTC serves as a resource to ETP project managers, providing a unique venue to perform in-house testing of technologies to support ETP goals.

**6.3.1 – Assessment Synchronization:** In 2013-2014, ETP staff will hold regular conversations with Codes & Standards staff to exchange methods for estimating the impacts of new measures through analysis and testing, and support the advancement of technologies that may be included in future codes and standards and reach codes. Where practical, the ETP will collaborate with Codes & Standards on measure assessments, and will seek to identify and transfer measures with potential to go directly from ETP to Codes & Standards.

**6.3.2 – Collaboration with Energy Centers:** ETP will continue to grow its multi-faceted collaboration with Energy Centers, where new measures for potential assessment may be suggested by visitors or staff, where some assessments may be conducted in a controlled field environment, and where successful assessments are often showcased in exhibits that educate hundreds to thousands of interested customers.

**6.3.3 – Cross-cutting Programs Coordination:** The statewide Workforce Education & Training (WE&T) and statewide Marketing, Education & Outreach (ME&O) programs will offer new coordination opportunities. ETP assessments and market and behavioral research may pinpoint marketing and education needs that these two cross-cutting

program can deliver. Conversely, these programs can identify opportunities for new or under-utilized measures, and may find potential limitations in EE measures that lend themselves to action by ETP. For instance, a new type of fan that is featured in a WET program could elicit comments by contractors about installation or maintenance issues that the ETP can address or can relay to the product developer or manufacturer. ETP will help identify workforce training needs, as appropriate, for advanced technologies in their early stages of development.

**6.3.4 – Feedback Loop with Cross-cutting Programs:** As with statewide and local IOU EE Resource and Non-Resource programs, the ETP will expand feedback loops with cross-cutting programs to increase the understanding by ETP and EE program staff of impacts from selected new measure that are relevant to the audiences, staff, and information gathering capabilities of the cross-cutting programs.

## 6.4 - ETP Coordination with IDSM

ETP has long-standing and strong connections with energy efficiency and demand response (DR) programs, and is poised for broader IDSM integration. In ~~2009-2011~~ 2013-2014, ETP will undertake a coordinated effort to support innovation in EE, DR, renewable and combined heat and power programs. Among the many examples of this, ZNE new commercial construction, ZNE new residential construction, and ZNE for existing buildings stand out as opportunities to integrate on-site or neighborhood generation, co-generation, EE, and DR opportunities. Under the ETP demonstration showcases Objective 1.4 and Goal 3 described in Section 5 above, residential and commercial sites will be developed featuring integrated energy systems for proof-of-concept, technology and usability assessment, and market exposure.

ETP brings a strong aptitude for IDSM integration, since assessment results for lighting and HVAC control strategies are equally applicable to EE and DR programs. It is natural to expand an ETP assessment to investigate both options with relatively modest incremental efforts, compared to an assessment for just EE or DR. Several control strategies listed under Action Strategy 1.1.1 in Section 5, above, can potentially be part of such an IDSM assessment.

Similarly, ETP has experience with EE – DR – on-site generation / cogeneration applications. For instance, ETP led efforts in 2007-2008 to obtain a CPUC waiver of EE Policy Manual requirements that might have disallowed incentive payments for the SolarBee water treatment technology, which uses integral onsite solar electric generation to operate.

Going forward, the EE Policy Manual should be revised to reflect a bias towards IDSM and to disambiguate issues like the one that raised questions about the SolarBee technology.

Finally, ETP IDSM coordination will benefit from the existing ETP network of partners described in Section 6.5., below, and elsewhere in Section 6. The statewide IDSM PIP provides additional information on these issues.

The IOUs will coordinate program efforts with the local utility integration teams and the Statewide Integration Task Force to identify successful integration approaches and offerings, potential pilot programs and metrics.

## 6.5 - ETP Coordination with External Organizations and Entities

Collaboration with external partners and allies plays an essential role in virtually all aspects of ETP operations, from screening and selecting measures for assessment, to performing assessments and scaled field placements, developing demonstration showcases, communicating ETP results, and transferring measures to the market through EE programs and other implementation channels.

**6.5.1 – Alliances External Organization:** To ensure successful coordination with the full range of external organizations and entities involved in developing new measures, ETP staff will receive explicit assignments and budgets for outreach and conference attendance to maintain a high level of awareness of research and development (R&D) activities across government, utilities, including those located in the Pacific Northwest, agricultural extension and university programs, and private industry, including selected proprietary efforts.

This interaction provides both ideas for new ETP measures and access by the ETP to propose new concepts or modifications to existing research that will result in measures for future ETP assessment and EE deployment. In this way, ETP uses its alliances with external R&D entities to leverage private industry and federally funded technology research and investment for the benefit of California ratepayers.

For instance, CEC and The Watt Stopper, Inc. have provided valuable new measures to the ETP and have also been receptive partners, incorporating ideas from the ETP for their new measure R&D.

## 6.6 – Codes and Standards Integration

When ETP has completed review of a measure, external organizations play a crucial role in disseminating the results before, during, and after the transfer of the measure into EE programs or other implementation channels. For instance, ETP collaborates with industry trade organizations, large tech companies, entrepreneurs, UC Berkeley Center for the Build Environment, consultants, and others on educational outreach for building envelope EE measures.

Another example is ETP work on HVAC measures that may go directly to building standards. In these cases, ETP supports the Statewide Codes & Standards program through at all stages of measure development and evaluation through alliances with the California Building Standards Commission, American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) technical committee members to accelerate building design standards.

On lighting measures, ETP works with the DOE, Environmental Protection Agency (EPA), Illuminating Engineering Society of North America (IESNA), CEC, including the CEC program, and leading lighting manufacturers and consultants.

## 7. Marketing and Outreach/Education & Training

To maximize the benefits of its work, the ETP delivers information in many forms to many different groups. (The primary means for the ETP to disseminate information is through EE programs, including the Energy Centers.)

Among these benefits, ETP communications on measures that are being transferred or have been transferred to EE programs will assist companies, departments, and governmental entities in understanding EE measures' actual performance, breaking down barriers to proactive implementation.

**7.1 – Sharing of Information through ETCC:** The ETP partners will continue to utilize the ETCC as a central medium for the delivery of ET information. The ETCC website (www.etcc-ca.com) provides an overview of the ET program, a database of ETP project reports and fact sheets, information on upcoming meetings, and information on hosting an emerging technology project or proposing a measure for consideration.

**7.2 – Distribution of Information through Other Sources:** The ETCC website is just one of ways the ET program transfers information. Findings, results, and analyses are delivered to a variety of audiences through one or more of the following mechanisms:

- Providing technical information to Energy Centers run by each of the IOUs, supporting Energy Center information dissemination;
- Providing technical information to utility energy efficiency programs, supporting energy efficiency program information dissemination;
- Speaking opportunities with community organizations;
- Presenting open houses at ETP demonstration showcase sites for key stakeholders and the public at large;
- Meetings and coordination with technology owners, manufacturers, allies, channel partners, trade association members, utilities, investors, and technology developers;
- Presentations at state, local, and national meetings and conferences;
- Analysis and design tools intended for utility energy efficiency program and product developers, technology owners and manufacturers, and others;
- Public relations efforts, such as development and dissemination of press releases, media kits, and articles for trade publications; and
- Organizing and producing the bi-annual Emerging Technology Summit Conference, a collaborative effort among the IOUs with the CEC Program.

## 8. TRIO and SCE's Technology Test Centers Description

### a) (2013-2014: Changed to a element that can be used to support Goal #1) Technology Resource Innovation Outreach (TRIO)

TRIO is a statewide element that aims to draw a greater number of providers of desired, energy saving measures into the utility EE and DR programs by:

- Providing training workshops;
- Providing energy efficiency and demand response "mentoring"; and
- Coordinating with existing clean tech programs (such as the California Cleantech Open and various clean tech business clusters).
- TRIO contribute to the market transformation with efforts that help accelerate the commercialization of energy-efficient measures by reaching out to universities, , investors, and other research organizations to encourage innovative EE and DR concepts. TRIO also reaches out to investor deal flows to find potential energy efficient measures. Determine what technologies the market is demanding.
- Participate and hold roundtable meetings with investors.
- Provide transparency of each IOU's demand side management rebate and incentive processes by providing statewide workshop rotating between IOUs, on "how to" do business with utilities. These workshops are geared toward third party implementers and the requirements necessary to be awarded a purchase order by a utility. These workshops will educate the investor and technology communities on the requirements necessary for doing business with utilities.
- These workshops will include the requirements of measure selection, DSM integration, technical documentation (for example, E-3 calculator, DEER etc.), energy efficient and demand response definitions, and the California Solar Initiative. Investors, entrepreneurs, and manufacturers will become educated about what a utility qualifies as an EE and demand response measure. This qualification will make the measure more viable for investment purposes.

**TRIO Coordination & Integration**

Statewide IOU coordination will include planning meetings to discuss the workshops and roundtables. Each utility will designate a TRIO contact person to coordinate the workshops. Each workshop is held at a different utility to support statewide participation. Each utility will manage their specific budgets. The criteria used to evaluate measures will be developed through a statewide ETP effort:

- TRIO statewide coordination - There will be planning meetings attended by all California IOUs to discuss workshops and roundtables.

- TRIO coordination with statewide and local EE programs - Meetings will be conducted and include program managers from statewide and local programs to assist in reviewing innovative measures.

- TRIO coordination with cross-cutting - Workshops and roundtables will state the need for cross-cutting programs. Any cross-cutting measure that comes to the TRIO program will be evaluated by cross-cutting program managers.

- TRIO coordination with IDSM - There will be DSM coordination during the workshops, educating the candidates about demand response, California Solar Initiative, and energy efficiency. Training materials will be created that include an explanation of how to incorporate IDSM. The roundtables discussions will also include these materials.

- TRIO Coordination with External Organizations and Entities - TRIO will invite , CalCEF, Cleantech Open, and various universities to education workshops on how to do business with utilities. Workshops will be sponsored by utilities 3 times per year.

**TRIO Marketing & Outreach/Education & Training**

- TRIO will provide three workshops per year for all stakeholders and roundtables with investors and government programs to provide education. TRIO will outreach by attending and judging innovative competitions at universities and Cleantech Open.

- The TRIO program workshops and roundtable schedules will be posted on the ETCC website. Presentation material from the events will also be posted on the website after the event is held.

**b) (2013-2014: To be considered a strategic shared resource for ETP and other IDSM programs; no longer a sub-program of ETP) SCE Technology Test Center**

SCE's Technology Test Center is a suite of testing facilities focused on evaluating IDSM technologies in controlled laboratory environments using sophisticated monitoring equipment. The TTC also provides unique capabilities for evaluating performance of emerging technologies. Located in Irwindale, the TTC is currently comprised of several controlled environment chambers and advanced lighting test stands, each equipped with high-tech data acquisition systems and focused on distinct end uses such as: refrigeration, air conditioning, and lighting. Established in 1996, these facilities are widely known for their past accomplishments in testing and promoting energy efficient technologies and strategies.

The TTC test facilities will provide critical services to a wide range of SDG&E's IDSM programs. The main function is to provide impartial laboratory testing and analysis of technologies in support of various IDSM goals and serve as a resource for Emerging Technology project managers. These activities will be used to expand the portfolio of EE/IDSM measure offerings, quantify energy savings for EE measures, alleviate concerns about performance uncertainties, and verify the feasibility and validity of proposed codes and standards enhancements. A laboratory setting allows for the performance of detailed and replicable tests which are realistic, impartial, and uninfluenced by variables. Tests may be conducted according to industry standard test procedures or based on particular environmental conditions experienced by SDG&E customers.

TTC staff will also serve a secondary function as a repository of technical information and expertise. The unique knowledge obtained from actually installing and working with equipment will be shared with IDSM program staff, SDG&E customers, regulatory bodies, industry groups, and other interested parties including IOU laboratories to ensure that IDSM activities are practical.

**Outcomes**

TTC will contribute to the technology evaluation efforts that accelerate the commercialization of IDSM measures by performing independent, unbiased lab testing of

existing products, new technologies and control schemes in support of IDSM and EE goals.

To ensure testing is conducted in the most relevant areas, TTC will actively participate in key industry forums to collect input from major actors including manufacturers, academia, regulatory agencies, EE program staff, and SDG&E customers to determine areas where testing is needed. Tests will be designed and conducted to deliver results which address the identified needs.

TTC will share findings with interested parties via technical reports, fact sheets, conference papers, presentations, and training classes. Interested parties may include product designers and manufacturers, installation contractors, IDSM programs, and end-users.

TTC will support IDSM programs including Emerging Technologies, Codes & Standards, and Demand Response programs by providing in-house testing capabilities. Many of the projects associated with these projects have testing components that must be conducted in a laboratory environment to reduce the risk of uncontrollable variables affecting the final results. The TTC has unique testing capabilities and few testing facilities in the U.S. have comparable competencies.

TTC will contribute to increased IDSM awareness of California residents by effectively disseminate findings of test projects and lessons learned regarding IDSM benefits and proper application of technologies with diverse audiences.

Most test projects will result in formal test reports posted on statewide websites. In addition to these reports, information will be incorporated into fact sheets, journal publications, conference presentations and proceedings, training classes, industry handbooks, regulatory proceedings, and IDSM program materials.

**TTC Coordination & Integration**

**i.** In addition to technology testing, TTC's lab activities will support coordination with SW IOUs, and integration with multitude of IDSM programs. Projects conducted at TTC will be funded by various IDSM programs including Emerging Technologies, Codes & Standards, and Demand Response as well as other IDSM programs. TTC statewide coordination – TTC will engage in SW coordination with IOU labs to ensure avoidance of redundant testing in most applications through effective communications for effective utilization of SW lab resources.

**ii.** TTC coordination with IDSM – Test facilities will be open to DSM programs where applicable. Results from all projects will be shared with DSM staff and will educate about potential EE opportunities.

**iii.** TTC Coordination with External Organizations and Entities - TTC will maintain continuous contact with researchers, manufacturers, distributors, and end-users. Relationships will continue to be such that information and advice can be shared freely.

**TTC Marketing & Outreach/Education & Training**

TTC will produce formal test reports for all technology evaluation projects conducted in the laboratories. Results and lessons learned will be incorporated into many information dissemination activities to diverse audiences. Information will be used in presentations at energy centers, joint IOU events, industry conferences, training classes for SDG&E employees and contractor groups, fact sheets, and industry publications.

TTC will maintain a website with results of completed projects and updates of projects in-progress.

**9. Quality Assurance and Evaluation Activities**

**a) Timeframe of process evaluations and quality assurance activities**

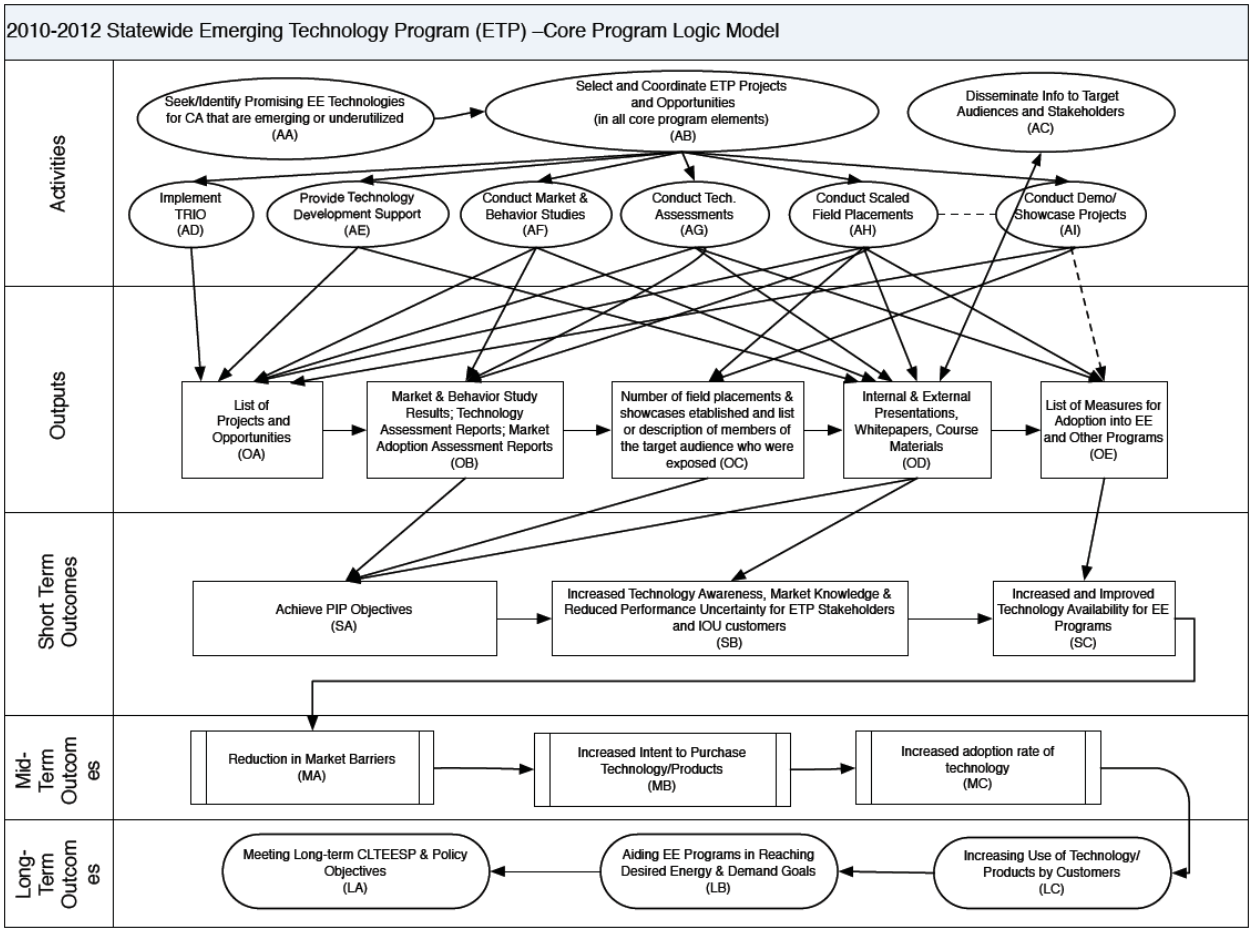
The utilities are proposing to work with the Energy Division to develop and submit a comprehensive EM&V Plan for 2013-2014 after the program implementation plans are filed. This will include process evaluations and other program-specific studies within the context of broader utility and Energy Division studies. More detailed plans for process evaluation and other program-specific evaluation efforts cannot be developed until after the final program design is approved by the CPUC and in many cases after program implementation has begun, since plans need to be based on identified program design and implementation issues.

The four IOUs will coordinate a statewide process evaluation to ensure that new program elements are being implemented as designed. This evaluation may be supplemented by specifically targeted activities that IOU program managers identify for purposes of continuous program improvement. These evaluations will be planned and launched on an as-needed basis.

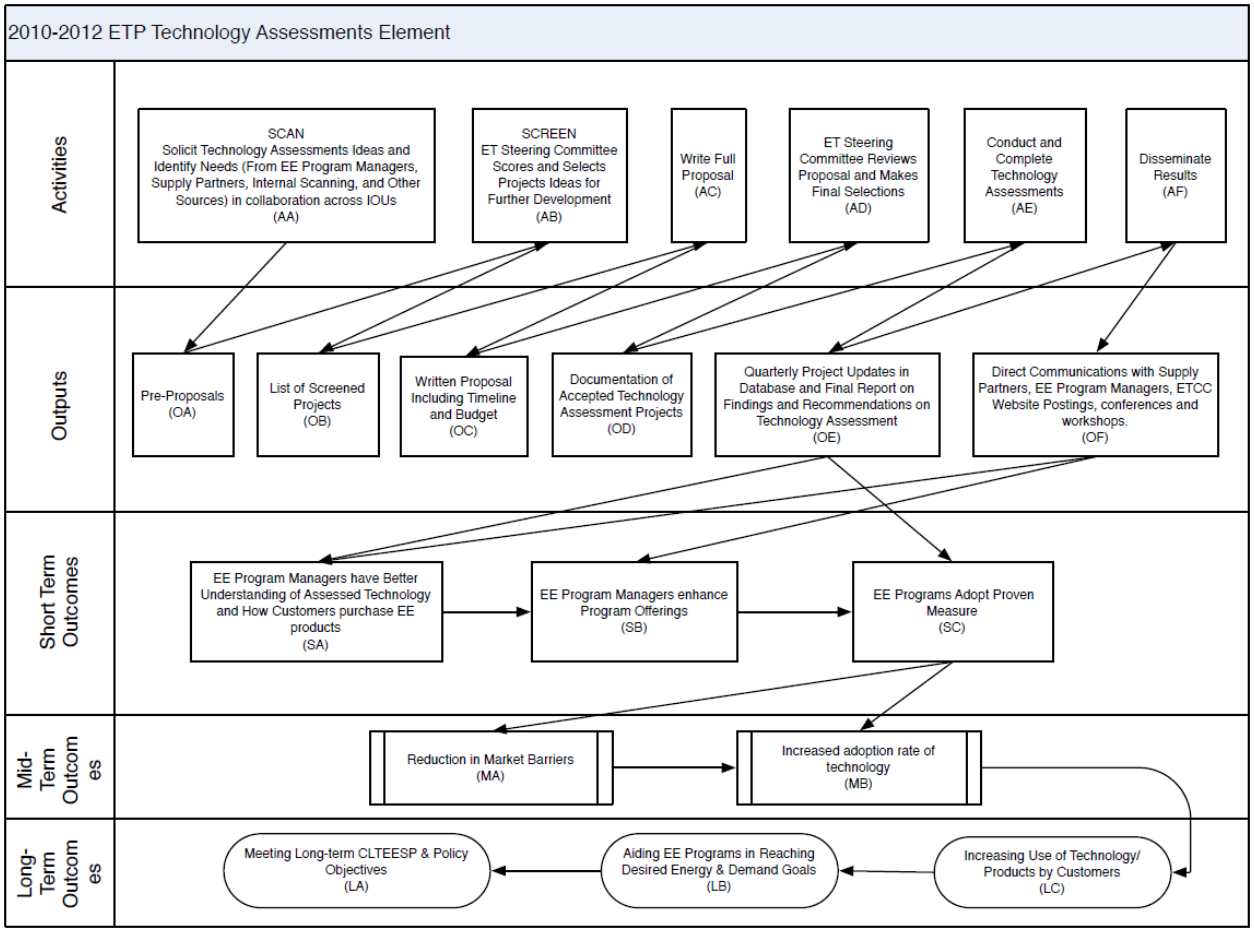
**10. Program Logic Model and Performance Indicators (Logic model to be developed at a later time for 2013-2014)**

On December 2, 2010, the Commission issued Resolution E-4385, approving Program Performance Metrics (PPMs) for Pacific Gas and Electric Company, Southern California Edison Company, Southern California Gas Company and San Diego Gas and Electric Company for 2010-2012 statewide energy efficiency programs and subprograms. In addition, this Resolution approved updated logic models for the statewide programs. Below are the approved logic models for the Emerging Technologies Program.

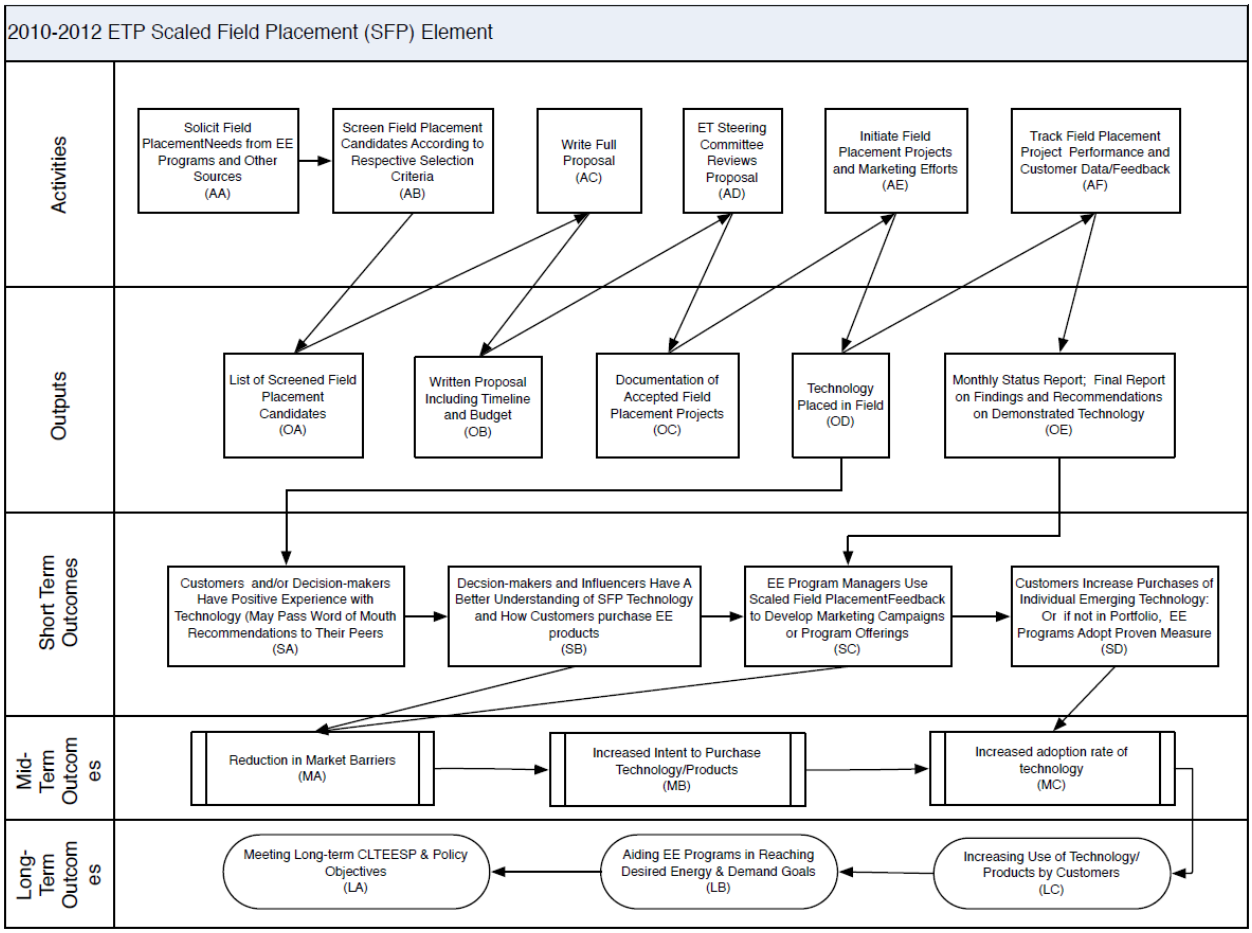
## ETP


2010-2012 Statewide Emerging Technology Program (ETP) –Core Program Logic Model
Activities
Outputs
Short Term Outcomes
Mid-Term Outcomes
Long-Term Outcomes
Seek/Identify Promising EE Technologies for CA that are emerging or underutilized (AA)
Select and Coordinate ETP Projects and Opportunities (in all core program elements) (AB)
Disseminate Info to Target Audiences and Stakeholders (AC)
Implement TRIO (AD)
Provide Technology Development Support (AE)
Conduct Market & Behavior Studies (AF)
Conduct Tech. Assessments (AG)
Conduct Scaled Field Placements (AH)
Conduct Demo/ Showcase Projects (AI)
List of Projects and Opportunities (OA)
Market & Behavior Study Results; Technology Assessment Reports; Market Adoption Assessment Reports (OB)
Number of field placements & showcases established and list or description of members of the target audience who were exposed (OC)
Internal & External Presentations, Whitepapers, Course Materials (OD)
List of Measures for Adoption into EE and Other Programs (OE)
Achieve PIP Objectives (SA)
Increased Technology Awareness, Market Knowledge & Reduced Performance Uncertainty for ETP Stakeholders and IOU customers (SB)
Increased and Improved Technology Availability for EE Programs (SC)
Reduction in Market Barriers (MA)
Increased Intent to Purchase Technology/Products (MB)
Increased adoption rate of technology (MC)
Meeting Long-term CLTEESP & Policy Objectives (LA)
Aiding EE Programs in Reaching Desired Energy & Demand Goals (LB)
Increasing Use of Technology/ Products by Customers (LC)

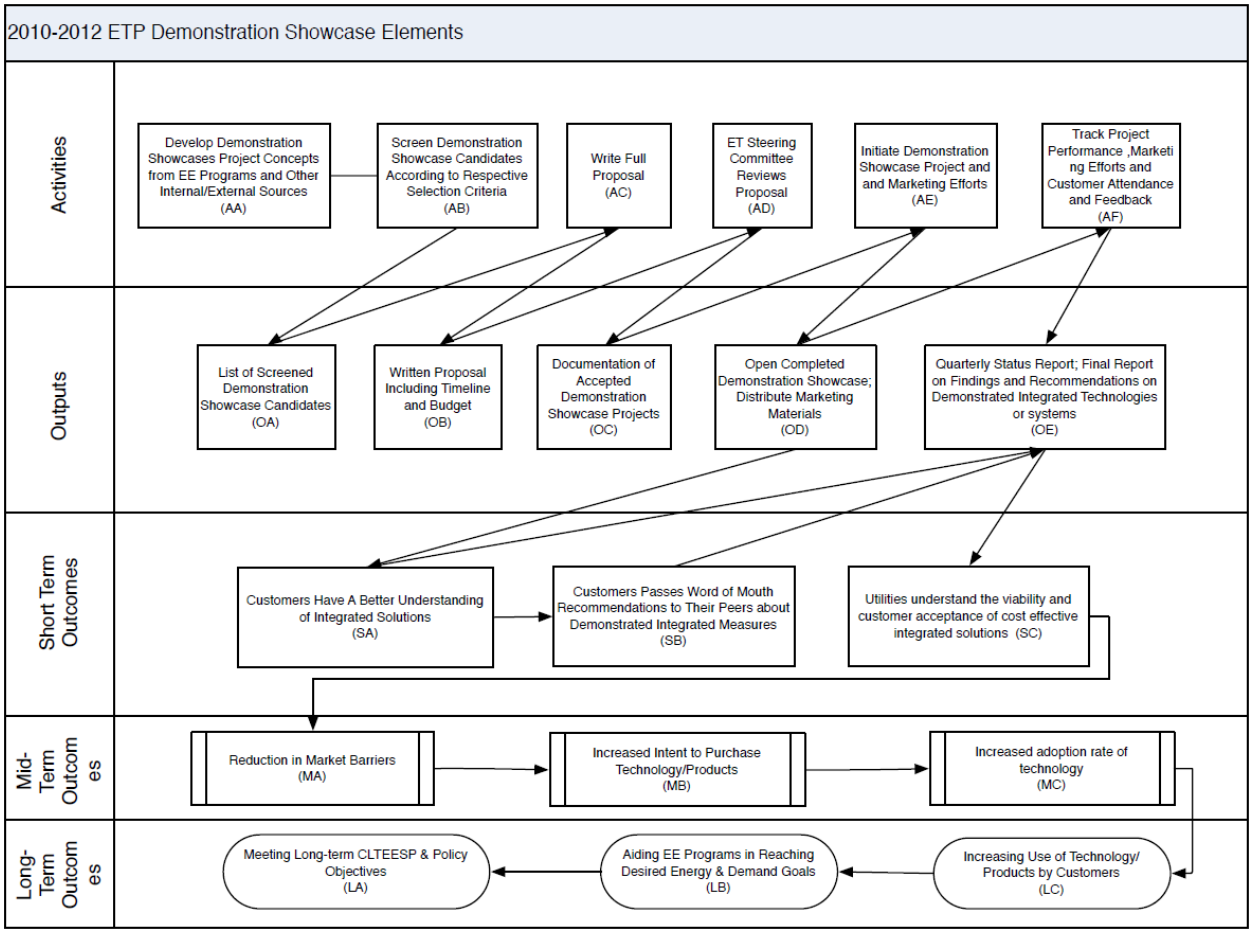
## Technology Assessments (Logic model to be developed at a later time for 2013-2014)



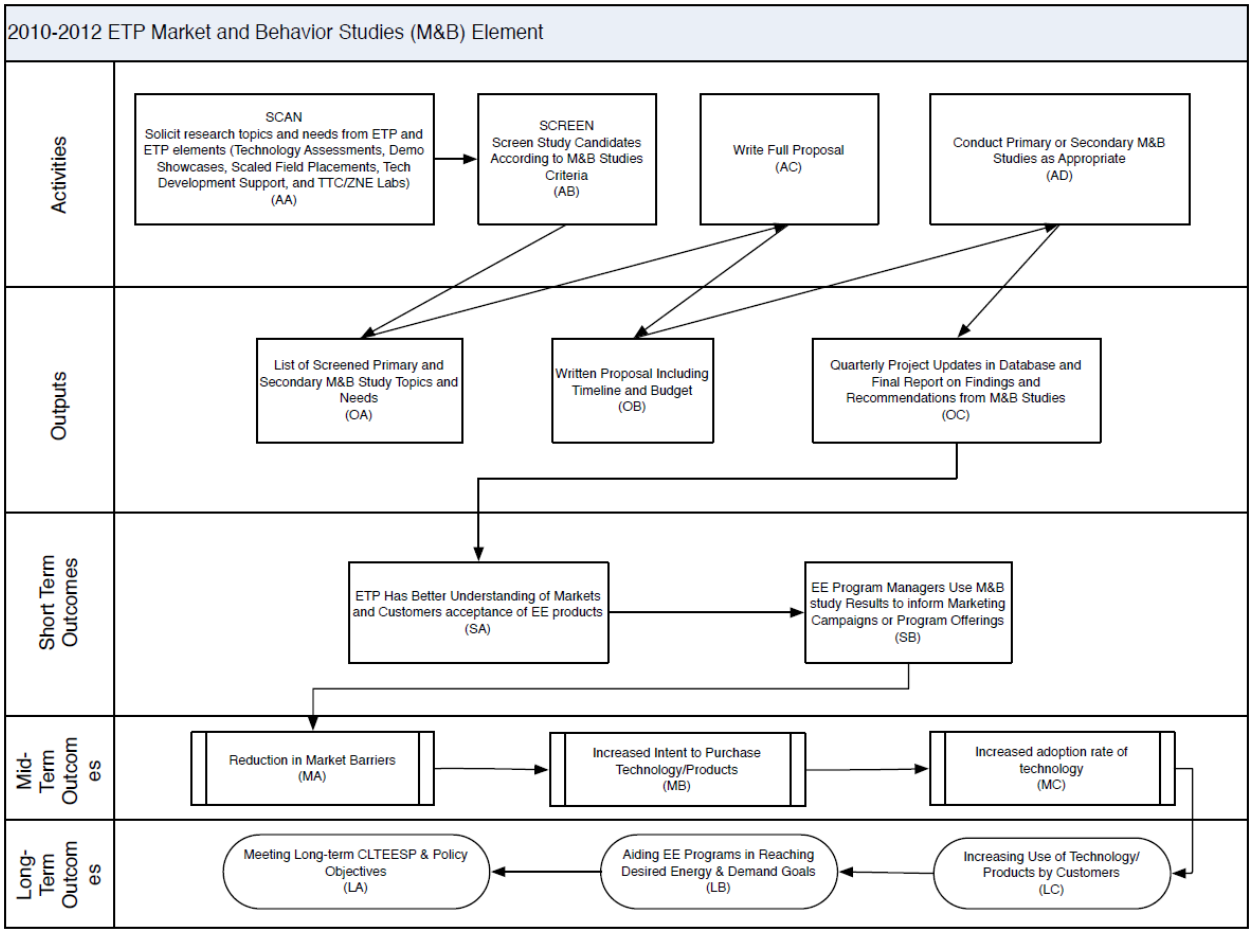
## Scaled Field Placements (2013-2014: No longer a sub-program; Changed to a "element" that can be used to support more than one Goal)



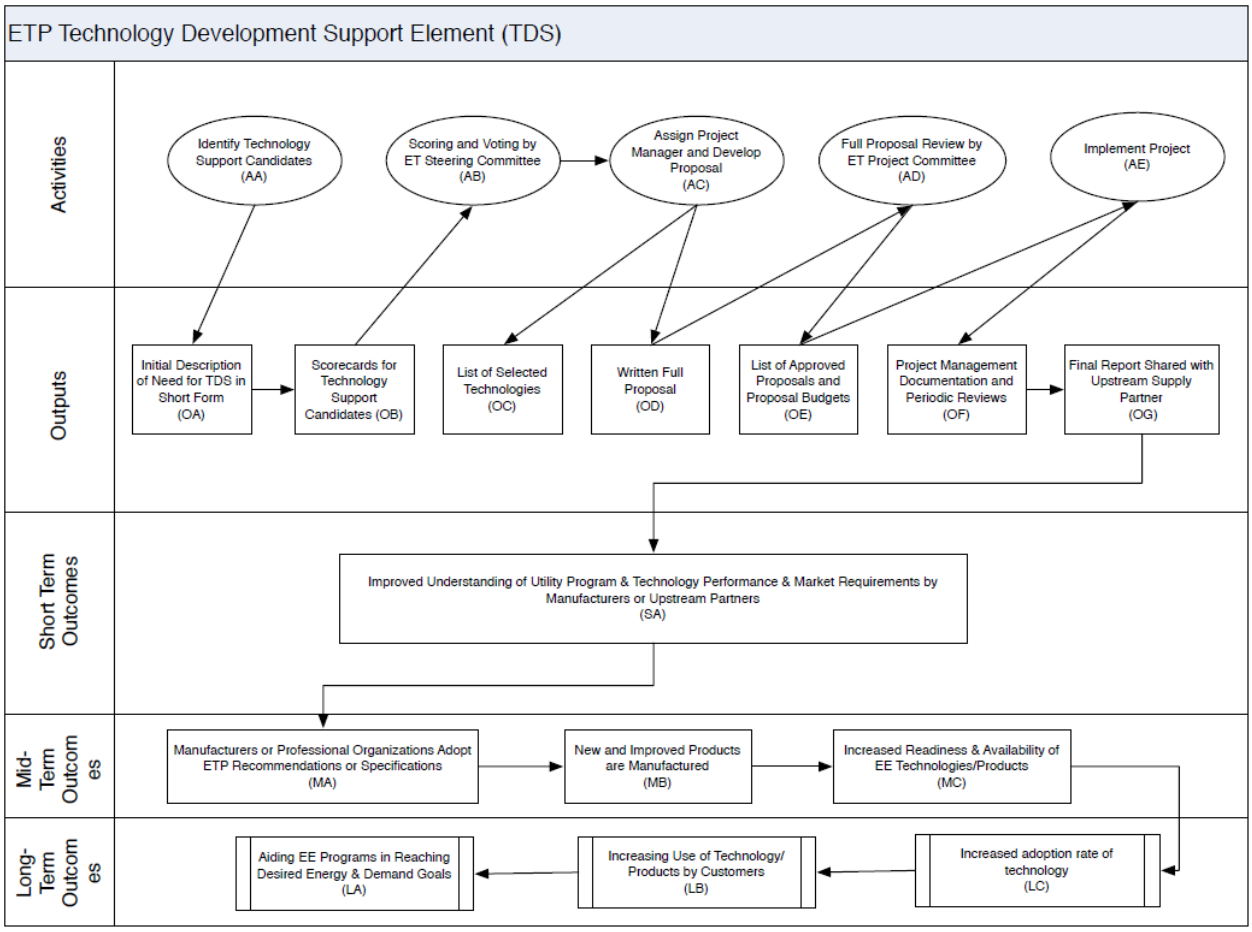
**Demonstration Showcases (2013-2014: No longer a sub-program; Changed to a "element" that can be used to support more than one Goal).**



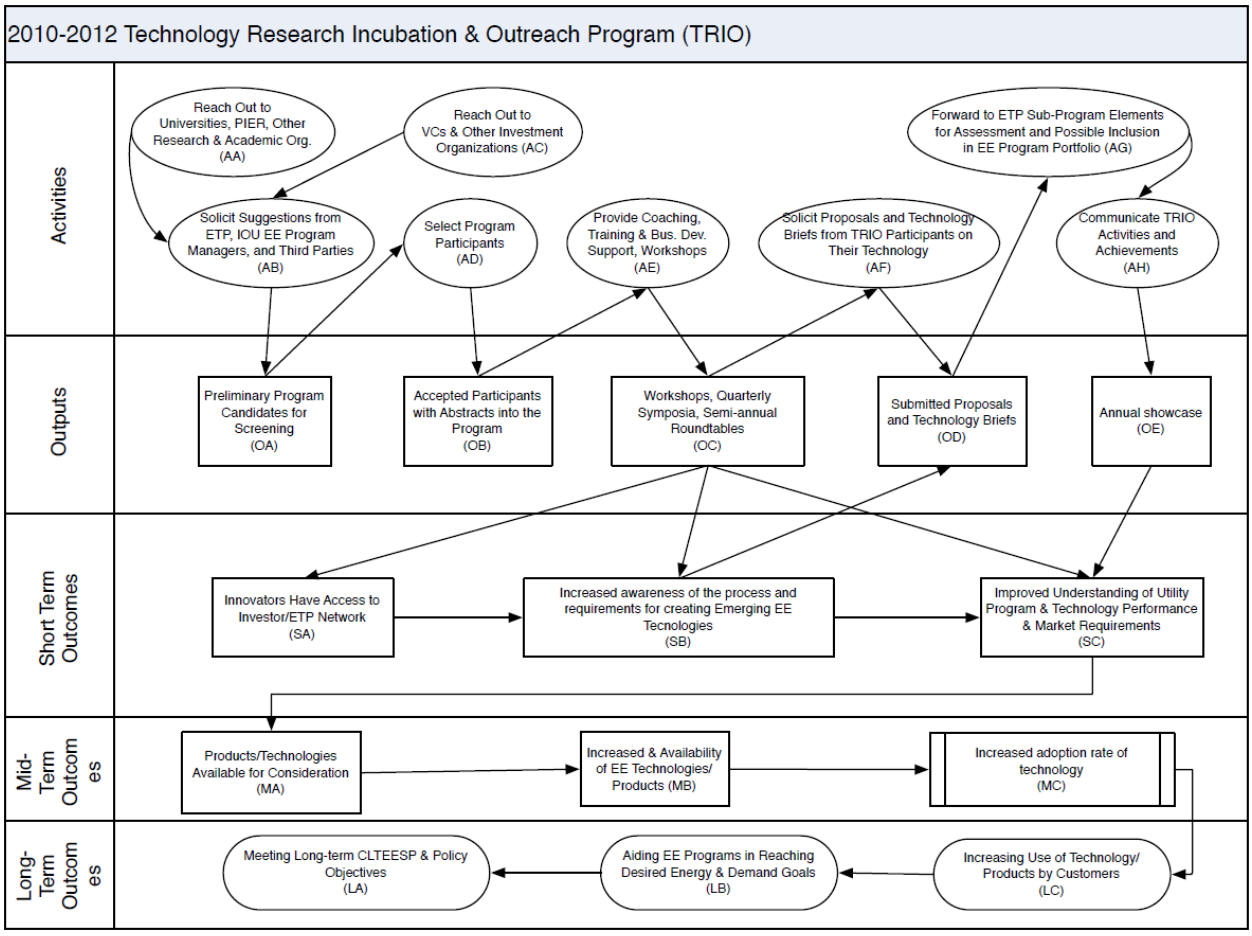
**Market and Behavioral Studies (2013-2014: No longer a sub-program; Changed to a "element" that can be used to support more than one Goal).**



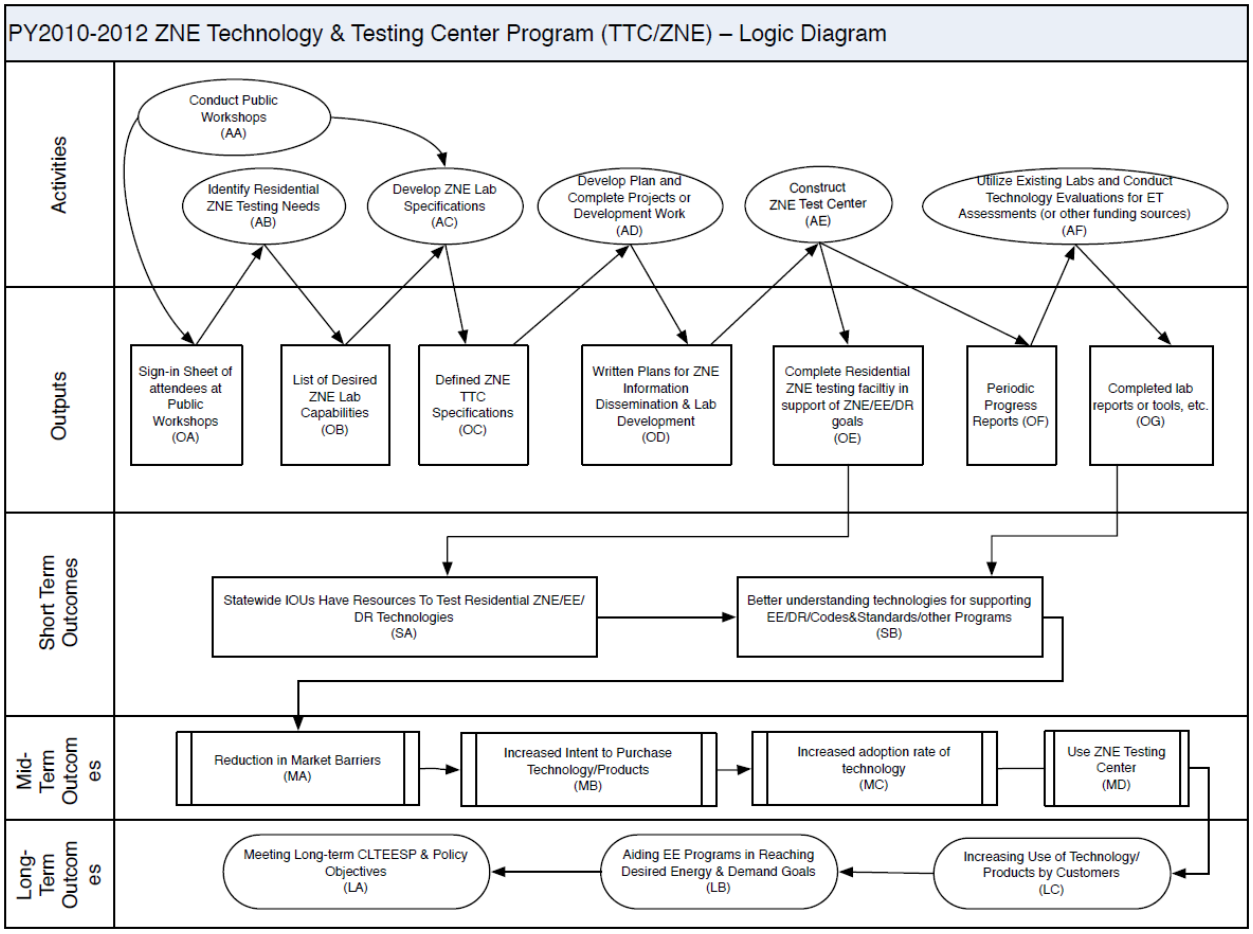
## Technology Development and Support (2013-2014: Merged into Sub-program #1. Logic model to be developed at a later time for 2013-2014)



**TRIO (2013-2014: No longer a sub-program; changed to a "element" that can be used to support Goal #1- SCE only)**



**TTC (2013-2014: No longer a sub-program; changed to a strategic resource that can be used to support more than one Goal).**



Appendix 1

# ET Program 2013-2014 Planning Budget

Tables A and B below represent ETP's Direct Implementation Budget Breakdown Per 2013-2014 portfolio guidance decision. The budget allocation will encompass both short-term and long-term focus activities. In general, activities under Technology Development Support are intended to support long-term focused efforts. Long-term efforts refer to efforts that are intended to yield result in three or more years. For the Technology Assessment and Technology Introduction Support, the allocation of budget is approximately 50% short-term and 50% long-term. For Technology Assessments of new advanced and/or unproven technologies versus emerging and/or under-utilized technologies, the program intends to allocate its budget equally to both categories of technologies.

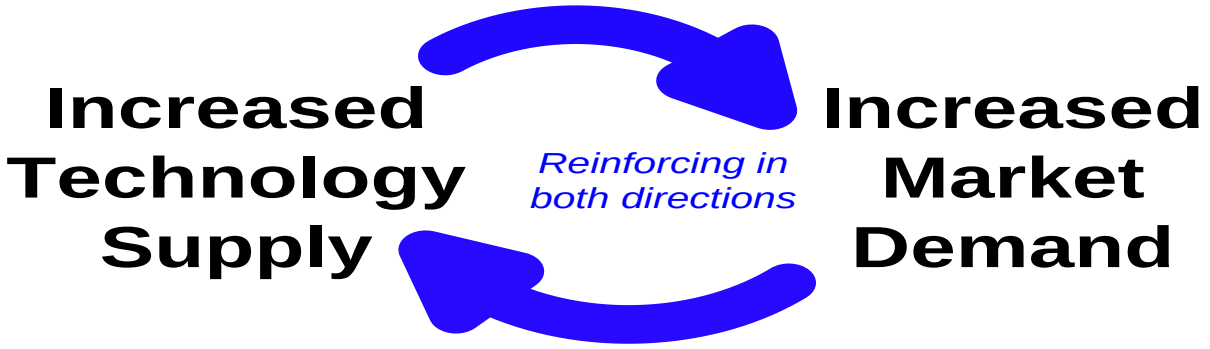
The information provided is for planning purposes only. Performance against budget allocations will not be tracked; however, reporting CPUC's ET database will be possible provided that capability is built by CPUC.

**Table A** – Project ETP Budget Breakdown by Segment

| | Residential | Commercial | Industrial | Agricultural | total |
|---|---|---|---|---|---|
| Technology Development Support | $1,095,341 | $2,008,126 | $365,114 | $182,557 | $3,651,138 |
| Technology Assessment | $3,961,252 | $7,262,295 | $1,320,417 | $660,209 | $13,204,173 |
| Technology Introduction Support | $2,235,683 | $4,098,752 | $745,228 | $372,614 | $7,452,276 |
| Total | $7,292,276 | $13,369,173 | $2,430,759 | $1,215,379 | $24,307,587 |

**Table B** – Project ETP Budget Breakdown by End-Use

| | HVAC | Plug Load/Controls | Lighting | Integ. Bldg Design & Ops | Other | total |
|---|---|---|---|---|---|---|
| Technology Development Support | $1,277,898 | $182,557 | $1,095,341 | $912,785 | $182,557 | $3,651,138 |
| Technology Assessment | $4,621,460 | $660,209 | $3,961,252 | $3,301,043 | $660,209 | $13,204,173 |
| Technology Introduction Support | $2,608,297 | $372,614 | $2,235,683 | $1,863,069 | $372,614 | $7,452,276 |
| Total | $8,507,655 | $1,215,379 | $7,292,276 | $6,076,897 | $1,215,379 | $24,307,587 |




**Activities Increasing Technology Supply**

- **Basic Research (Not ET)**
  - Perform technology research
  - Fund universities and labs
- **Support Technology Development (ET)**
  - Provide /collect market intelligence
  - Access to testing facilities
  - Contacts for customer testing/feedback
  - Establish standard test procedures
  - Establish baseline performance levels
  - Access to utility personnel for input
- **Outreach (ET)**
  - General outreach efforts
  - Lend credibility to select companies/ technologies
- **FORESEEABLE market demand (ET collaborates w/ EE)**
  - Future codes/stds announcements
  - Communicate future rebate programs (w/specs)
  - Other future adoption incentives

**Activities Supporting Increasing Market Demand**

- **Assessments – reduce risk (ET)**
  - Work paper data
  - Software updates
- **Scaled Field Placements(ET)**
- **Demonstration Showcases (ET)**
- **Market and Behavioral Studies (ET)**
- **Rebate Programs (EE)**
- **Education / Training (EE)**
- **TOU Rates / Cost Incentives (Regulatory)**
- **Codes & Standards (Codes & Standards)**
- **Social "Green" Marketing (IOU or other)**

Appendix 3

## ETP Database Project Naming Convention

The ETP database project naming convention will be as follows:

ETYYUUUNNNN

YY is the project initiation or funding year (e.g., 13 for 2013)

UUU is a three- letter utility descriptor (e.g., SCE, PGE, SCG, SDG, SEM)

NNNN is a four-digit numerical identification code for the project assigned by the IOU.

- The first N is for Program Element (1-Technology Assessments, 7-Technology Development Support,8-Technology Introduction Support)
- The second and third Ns are 01-99 project number sequence
- The fourth N is for project phase
    - NOTE - 0 is considered the first phase

Example: ET13SCE1050 - This is a first phase 2013 Technology Assessments project with a project sequence number five.

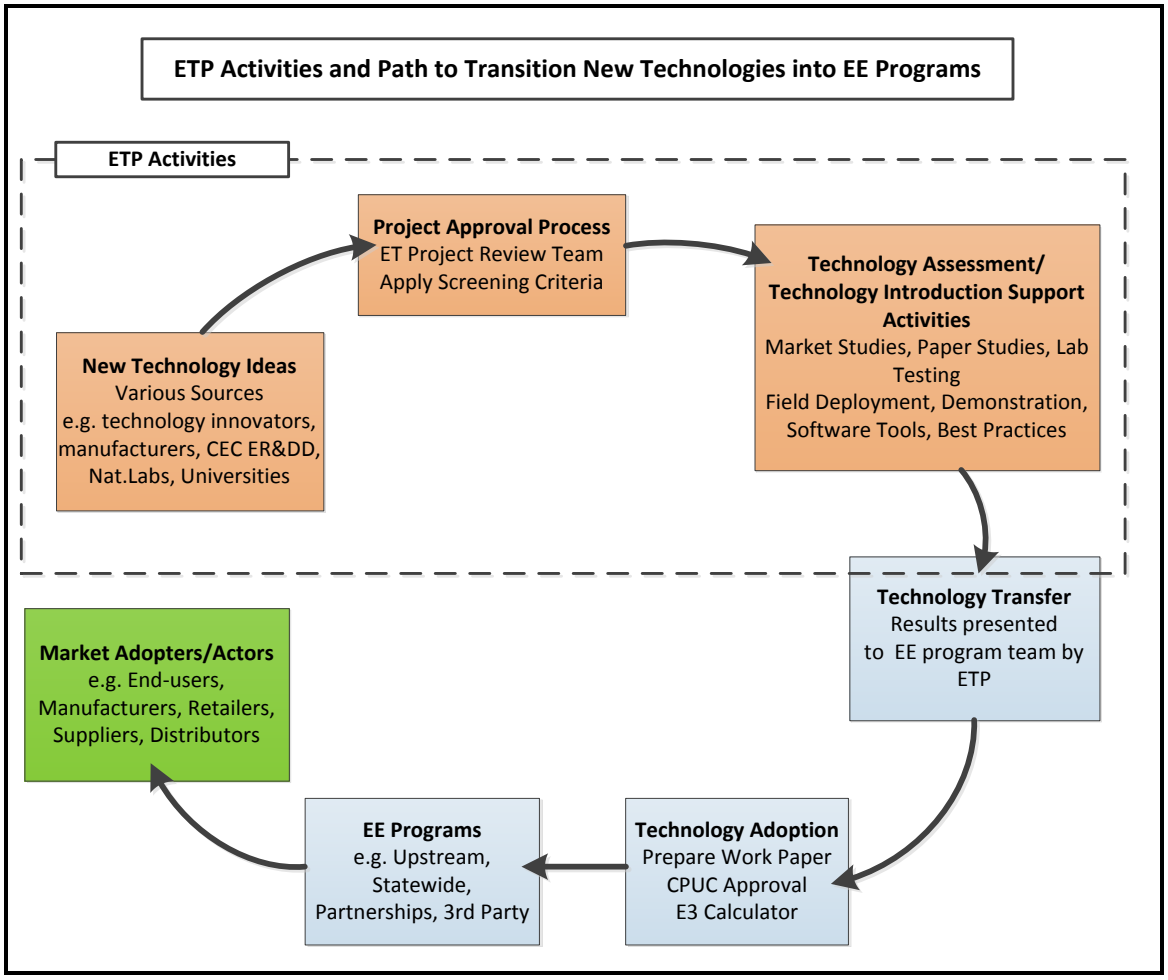
Note that project names will be issued during or after the initial project screening.

The data from these project databases will be extracted and sent to the CPUC under the same naming convention.

Appendix 4

## ETP Activities and Path to Transition New Technologies into EE Programs

The diagram below depicts the activities to transition new technologies into utility EE programs. These activities would help transition technologies from various sources, including national labs, universities, manufacturers and technology innovators. The initial review of a technology idea's viability as a rebated measure will be conducted by ETP staff. Following this initial review, ETP staff may determine that additional information is needed and undertake further studies and demonstrations as appropriate. After a technology meets the initial program requirements for rebates, further information must be gathered on the technology's energy savings performance in order to provide the CPUC-required Work Paper that will be used to support energy savings claims.



# 2013-2014 PIP Addendum

| | | | |
|---|---|---|---|
| **Program Name** | Codes and Standards | **Date Submitted** | 7/2/2012 |
| **Subprogram Name** | Various | **Utility Name** | |
| **Program ID** | SDG&E | **IOU Program Contact** | |
| | | **Program Cycle** | 2013-2014 |

This form is to be used to document any required changes to the Program Implementation Plans (PIPs). The following are triggers that will require a PIP change:

1. Changes to eligibiity rules
2. Changes affecting incentive levels (indicate advice letter approval below if required)
3. Fund shifts (indicate advice letter approval below if required)
4. **Portfolio Budget and Other Commission–Directed Changes**
5. Changes to Program Theory/Logic Models
6. Addition or elimination of programs and/or sub-programs (indicate advice letter approval below)
7. Changes in program targets
8. Change in sub-program approach - unless the IOUs submit logic models for the sub-programs (to be defined) with IOUs
9. Changes in incented measures
10. Changes in adopted PPMs/MTIs (indicate advice letter approval below if required)

Identify Specific Trigger (above) requiring the PIP change

4. Portfolio Budget and Other Commission-Directed Changes

Driver of Change:

Decision 12-05-015 May 10, 2012. DECISION PROVIDING GUIDANCE ON 2013-2014 ENERGY EFFICIENCY PORTFOLIOS AND 2012 MARKETING, EDUCATION, AND OUTREACH.

**Description of Change (if advice letter approval required, indicate Commission resolution or approval and provide hyperlink to advice letter):**

a) Consolidation of all compliance improvement activities into one subprogram.
b) Addition of statewide planning and coordination subprogram.
c) Responses to ordering paragraphs.

PIP Section and/or Wording to be Changed or replaced:

See below

Replacement Language or Information

See below

Revised Energy Savings (If Any):

See below

Other PIP Changes Required:

1. **Program Name:** Codes and Standards
2. **Program ID:**
3. **SDG&E Program Type:** Core

## 4. Projected Program Budget Tables

Table 1[1]

| Program Code | Program Name | Administrative Amount | Marketing Amount | Direct Install Amount | Incentive Amount | Total Budget Amount |
|---|---|---|---|---|---|---|
| | **SW Codes & Standards** | | | | | |
| 3249 | SW C&S - Building Codes & Compliance Advocacy | $51,478 | $0 | $490,462 | $0 | $541,940 |
| 3250 | SW C&S - Appliance Standards Advocacy | $40,803 | $0 | $384,370 | $0 | $425,173 |
| 3251 | SW C&S - Compliance Enhancement | $61,331 | $0 | $580,554 | $0 | $641,886 |
| 3252 | SW C&S - Reach Codes | $17,333 | $0 | $172,185 | $0 | $189,518 |
| 3253 | SW C&S - Planning Coordination | $29,666 | $0 | $270,277 | $0 | $299,943 |
| | TOTAL: | $200,611 | $0 | $1,897,848 | $0 | $2,098,460 |

## 5. Total Projected Program Savings by Subprogram (Gross)

Table 2

| Program Code | Program Name | Gross kW Savings | Gross kWh Savings | Gross Therm Savings |
|---|---|---|---|---|
| | **SW Codes & Standards** | | | |
| 3249 | SW C&S - Building Codes & Compliance Advocacy | 12,408 | 94,323,967 | 108,289 |
| 3250 | SW C&S - Appliance Standards Advocacy | 0 | 0 | 0 |
| 3251 | SW C&S - Compliance Enhancement | 0 | 0 | 0 |
| 3252 | SW C&S - Reach Codes | 0 | 0 | 0 |
| 3253 | SW C&S - Planning Coordination | 0 | 0 | 0 |
| | TOTAL: | 12,408 | 94,323,967 | 108,289 |

## 6. Projected Program Impacts Tables

Table 3

| | Building Codes Advocacy | | | Appliance Standards Advocacy | | | Compliance Improvement | | | Reach Codes | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | GWh | MW | MTherms | GWh | MW | MTherms | GWh | MW | MTherms | GWh | MW | MTherms |
| PG&E | 137 | 32 | 4.2 | 1,188 | 145 | 2.4 | 31 | 5 | 0.3 | 3 | 0 | 0.15 |
| SCE | 141 | 33 | 0 | 1,225 | 149 | 0 | 32 | 5 | 0 | 4 | 0 | 0 |
| SDG&E | 32 | 7 | 0.5 | 278 | 34 | 0.3 | 7 | 1 | 0.03 | 1 | 0 | 0.02 |
| SCG | 0 | 0 | 6.7 | 0 | 0 | 3.8 | 0 | 0 | 0.4 | 0 | 0 | 0.24 |
| Total | 310 | 72 | 11.3 | 2,692 | 327 | 6.5 | 71 | 10 | 0.7 | 8 | 0 | 0.41 |

[1] Definition of Table 1 Column Headings: Total Budget is the sum of all other columns presented here

**7. Total Projected Program Savings by IOU (Gross)**

Table 4

| | PG&E | | | SCE | | SDG&E | | | SCG |
|---|---|---|---|---|---|---|---|---|---|
| | GWh | MW | MTherms | GWh | MW | GWh | MW | MTherms | MTherms |
| Building Codes Advocacy | 137 | 32 | 4.2 | 141 | 33 | 32 | 7 | 0.5 | 6.7 |
| Appliance Standards Advocacy | 1,188 | 145 | 2.4 | 1,225 | 149 | 278 | 34 | 0.3 | 3.8 |
| Compliance Improvement | 31 | 5 | 0.3 | 32 | 5 | 7 | 1 | 0.03 | 0.4 |
| Reach Codes | 3 | 0 | 0.1 | 4 | 0 | 0.8 | 0 | 0.02 | 0.2 |
| Total | 1,360 | 181 | 7.0 | 1,402 | 187 | 318 | 42 | 0.8 | 11.2 |

Tables 3 and 4 include savings from the following California Energy Commission (CEC) proceedings.

- 2003 Title 24 (Building regulations adopted in 2003 and effective in 2005, we have previously referred to these as 2005 Title-24.)
- 2004 Title 20 (Appliance regulations adopted in 2004 and effective in 2006, 2007 or 2008, we have previously referred to these as 2005 Title 20.)
- 2006 Title 20 Tier II Lighting (Adopted in 2006, effective in 2008.)
- 2008 Title 24 (Adopted in 2008, effective in 2010.)
- 2008 Title 20 (Lighting standards adopted in 2008, effective in 2010, 2011, 2012, and 2013.)
- 2009 Title 20 (Television standards adopted in 2009, effective 2011 and 2013.)
- 2011 Title 20 (Battery charger standards adopted 2012, effective 2014.)
- Various Federal appliance standards (motors, vending machines, commercial refrigeration, ASHRAE products, etc.)
- 2013 Title 24 (Building regulations adopted in 2012, effective 2014.)

Table 3 and 4 savings are calculated from the sum of first-year gross savings from each CEC proceeding in 2009, 2010, and 2011. Gross savings are calculated from projected statewide installations, compliance, energy use baseline, and unit energy savings, prior to correcting for naturally occurring market adoption and attribution.

Savings in Table 3 and Table 4 are based on actual installation of measures, consistent with the rest of the portfolio that savings are real and in existence; therefore, 100% credit is assumed for savings from all proceedings, including those from pre-2006 adoptions.

**Table 5: Total Projected Program Savings by Subprogram (Net)**

| | Building Codes Advocacy | | | Appliance Standards Advocacy | | | Compliance Improvement | | | Reach Codes | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | GWh | MW | MTherms | GWh | MW | MTherms | GWh | MW | MTherms | GWh | MW | MTherms |
| PG&E | 49 | 12 | 2.2 | 418 | 46 | 1.0 | 11 | 2 | 0.1 | 2 | 0 | 0.1 |
| SCE | 50 | 13 | 0 | 432 | 48 | 0 | 11 | 2 | 0 | 3 | 0 | 0 |
| SDG&E | 11 | 3 | 0.2 | 98 | 11 | 0.1 | 3 | 0 | 0.02 | 1 | 0 | 0.01 |
| SCG | 0 | 0 | 3.5 | 0 | 0 | 1.5 | 0 | 0 | 0.2 | 0 | 0 | 0.2 |
| Total | 111 | 28 | 5.9 | 948 | 105 | 2.6 | 25 | 4 | 0.4 | 6 | 0 | 0.3 |

**Table 6: Total Projected Program Savings by IOU (Net)**

| | PG&E | | | SCE | | SDG&E | | | SCG |
|---|---|---|---|---|---|---|---|---|---|
| | GWh | MW | Therms | GWh | MW | GWh | MW | Therms | Therms |
| Building Codes Advocacy | 49 | 12 | 2.2 | 50 | 13 | 11 | 3 | 0.2 | 3.5 |
| Appliance Standards Advocacy | 418 | 46 | 1.0 | 432 | 48 | 98 | 11 | 0.1 | 1.5 |
| Compliance Improvement | 11 | 2 | 0.1 | 11 | 2 | 3 | 0 | 0.02 | 0.2 |
| Reach Codes | 2 | 0 | 0.1 | 3 | 0 | 1 | 0 | 0.01 | 0.2 |
| Total | 481 | 60 | 3.4 | 496 | 62 | 113 | 14 | 0.4 | 5.4 |

Table 5 and Table 6 savings are calculated from the sum of first-year net savings from CEC proceeding that produces savings in 2013 and 2014.

## 4. Program Mission

The Codes and Standards (C&S) program saves energy on behalf of ratepayers by influencing continuous improvements in energy efficiency regulations, improving compliance with existing codes and standards, and working with local governments to develop ordinances that exceed statewide minimum requirements. Both the C&S program advocacy and compliance improvement activities extend to virtually all buildings and potentially any appliance in California.

The C&S program conducts advocacy activities to improve building and appliance efficiency regulations. The principal audience is the California Energy Commission (CEC) which conducts periodic rulemakings, usually on a three-year cycle (for building regulations), to update building and appliance energy efficiency regulations. C&S also seeks to influence the United States Department of Energy (DOE) in setting national energy policy that impacts California.

In some cases we may seek to influence the state legislature and other state agencies like California Air Resources Board (CARB) to influence policy regarding buildings and appliances. We may explore ways to influence the US Congress outside the traditional means of negotiating though Federal partners such as American Council for an Energy Efficient Economy (ACEEE) or Appliance Standards Awareness Project (ASAP).

Codes And Standards Enhancement (CASE) studies, focused on energy efficiency improvements, are developed for promising design practices and technologies and presented to standards- and code-setting bodies. Advocacy also includes affirmative expert testimony at public workshops and hearings, participation in stakeholder meetings, ongoing communications with industry, and a variety of other support activities.

The program participates in DOE proceedings and legislative negotiations leading to federal regulations that are passed through to California; in particular, Title 20 appliance efficiency regulations that are the same as Federal regulations.

Following adoption, C&S supports compliance improvement with both Title 24 building codes and Title 20 appliance standards. Compliance improvement activities complement the advocacy work by maximizing verified savings sfrom codes and standards that are realized and persist over time. The Compliance Improvement subprogram targets market actors throughout the entire compliance chain, providing education, outreach, and technical support and resources to improve compliance with both the building and appliance energy standards. Compliance improvement responds to the CPUC's interest in robust implementation of existing standards and support for the California Long Term Energy Efficiency Strategic Plan's HVAC Big Bold strategies.

The program carries out strategic activities that support or shape future codes and standards. In addition to mandatory minimum-level codes, the C&S program advocates for the development and implementation of "reach codes" that exceed minimum state code requirements and may be adopted by local jurisdictions or agencies. The program monitors and/or participates in a wide range of activities or proceedings that have direct or indirect impacts on California regulations including, but not limited to American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE), international activities involving Europe, Asia, Canada, and Australia, voluntary standards such as green building codes, and ratings organizations such as the Cool Roof Rating Council (CRRC), National Fenestration Rating Council (NFRC), and the United States Green Building Council (USGBC). Additionally, the program intervenes in Energy Star and other voluntary activities, as necessary, to shape future regulations or support coordination with voluntary programs.

The new Planning and Coordination subprogram expands the coordination role of the C&S program in the market adoption cycle for energy efficiency technologies and practices. As many of the measures offered through voluntary programs are adopted into the standards, C&S will coordinate both internally and externally to support a dynamic approach to portfolio planning with the objective of accelerating market acceptance and ultimately the adoption of successful, cost-effective technologies or practices into code. C&S will directly support the goals and objectives of both the CA Long Term Energy Efficiency Strategic Plan

and the Codes and Standards Action Plan currently under development, subject to budget constraints.

A glossary of acronyms used in this document is provided at the end of the document.

## 5. Program Rationale and Expected Outcome

### a) Quantitative Baseline and Market Transformation Information

On December 2, 2010, the Commission issued Resolution E-4385, approving Program Performance Metrics (PPMs) for Pacific Gas and Electric Company, Southern California Edison Company, Southern California Gas Company and San Diego Gas and Electric Company for 2010-2012 statewide energy efficiency programs and subprograms. The Commission gave each PPM a metric type which indicated the reporting frequency: Metric type 2a indicates that the IOUs should report on the metric on an annual basis (unless indicated otherwise). Metric type 2b indicates the IOUs should report on the metric at the end of the program cycle.

Below are the approved PPMs and metric types for the Codes and Standards Statewide Program (Resolution E-4385, Appendix A):

| **CODES AND STANDARDS** | | |
|---|---|---|
| ***Building Standards Advocacy*** | 1. Number of Residential and Commercial CASE studies, as defined in Building Standards Objectives 1 & 2 for which adoption by the CEC is anticipated by the IOUs, targeting efficient technologies practices and design in each of the following areas: lighting; HVAC; envelope; water heating; and cross-cutting measures in support of the following:<br>(a) Integrated Design, including data management and automated diagnostic systems, with emphasis on HVAC aspects of Whole Building,<br>(b) ZNE technologies, practices, and design in Residential Sector,<br>(c) Peak efficient technologies including plug loads and HVAC technologies,<br>(d) Advanced Lighting Technologies | 2b |
| ***Appliance Standards Advocacy*** | Number of draft CASE Studies, as defined in Appliance Standards Objective 1, developed as mutually agreed upon by the CEC and IOUs in support of plug loads, refrigeration, advanced lighting, and/or other technologies that are adopted by the CEC, within authorized budget. | 2b |
| ***Compliance Improvement*** | Number of role-based, Title 24 training sessions delivered. | 2a |
| ***Reach Codes*** | Number of jurisdictions in IOU Service territories with CEC approved Reach Codes in residential and/or commercial sectors as a result of the RC sub-program activities. | 2b |

## b) Market Transformation Information

Market Transformation Indicators (MTIs)

Per Resolution E-4385, a subset of market transformation indicators (MTIs) for statewide energy efficiency programs and subprograms were presented at a public workshop on November 7, 2011, to allow for public comments and discussion before being finalized. Per the Assigned Commissioner's Ruling. The following are the MTIs approved for the C&S program.

## c) Program Design to Overcome Barriers

The statewide Codes and Standards Program has five subprograms including:

1) Building Energy Codes Advocacy
2) Appliance Standards Advocacy
3) Compliance Improvement
4) Reach Codes
5) Planning and Coordination

**Building Code and Appliance Standards Advocacy Subprograms**
Codes and standards advocacy comprises a portfolio level strategy that complements incentive and information offerings in several ways. Since IOU incentive and rebate programs typically capture only a small percentage of the market, a transition to regulatory intervention is essential to maximize portfolio energy savings. This transition to code causes a once high-margin product to become an industry standard; thereby reducing the overall cost to society for energy efficiency. This commoditization effect, in turn, spurs innovation for new high-margin products since most manufacturers and other industry practitioners seek to compete in part on high-margin differentiated products.

As involuntary interventions, codes and standards are effective at breaking down market barriers such as split incentives between building owners and tenants that are difficult to overcome through incentive and information programs. Minimum code requirements direct consumers', builder's and renovation contractor's choices of materials and appliances to higher efficiency products, thereby reducing monthly energy bills to tenants. Regulations also improve equity in benefits from IOU customer investments in energy efficiency through rates. Through codes and standards, positive changes initiated through voluntary programs targeting early adopters are extended to all customers. Hence, hard-to-reach groups that do not participate in voluntary offerings benefit through codes and standards.

Baselines for building and appliance advocacy activities are developed in two ways. If the objective of a code proposal is to update an existing standard, the baseline is simply the existing standard. If the objective is a new standard, which expands the scope of building or appliance efficiency regulations, the baseline is established through market

characterization studies prior to or during the development of the CASE study unless a recent preexisting market characterization study can be found. Hence, baselines for new standards often do not exist until a draft CASE study is complete.

IOU support for recent CEC code upgrade cycles – in particular, the 2003, 2004, 2006, and 2008 CEC proceedings – for new building codes and appliance standards has significantly increased the rate of change in regulations compared to previous code cycles. Moreover, the scope of regulations has grown to include Title 24 alterations for measures such as duct sealing when replacing HVAC system components, and numerous appliances have been added to Title 20. These changes have created a significant need to support the successful implementation of the standards by improving industry awareness and understanding of California regulations.

As compliance improvement efforts are carried out to improve the rate-of-compliance -- with building codes or appliance standards, the benefits of the increase in compliance are captured in the Advocacy subprogram savings, as part of the verified C&S program energy savings. Determination of compliance improvement savings requires that program savings be recalculated periodically based on recurring CPUC evaluations of compliance rates.

**Compliance Improvement (CI) Subprogram**

Compliance improvement is increasingly important to the energy efficiency industry in California. Having supported the commercialization of efficient technologies and practices through IOU incentive and rebate programs, achieving satisfactory compliance is a crucial requirement for capturing market change for the long-term benefit of society. Broad compliance is necessary to level the playing field for well-intentioned suppliers and contractors who are otherwise faced with a competitive disadvantage when complying with regulations. Greater compliance strengthens voluntary program baselines, provides a solid foundation for future robust advocacy efforts, and improves throughput of California's energy efficiency industry by removing an industry bottleneck.

The primary barriers to compliance with the building standards include the complexity of the standards and limited resources available for enforcement by local governments and the CEC. Although education and training are not substitutes for enforcement, they increase compliance rates by generating awareness and improving understanding of regulations, and by equipping key market actors in the compliance supply chain with the tools and knowledge necessary for compliance. The CI subprogram will offer training and resources to market actors throughout the compliance delivery chain, which may include, but is not limited to energy consultants, building department staff, contractors, and design professionals.

In addition, the CI subprogram will work with local government and other industry partners to provide technical support and other resources, such as process improvement tools. The CI subprogram will document best practices and lessons learned from the Best Practices study completed in 2012, and will work with California Building Officials (CALBO), CEC, and local government partners to encourage other jurisdictions to adopt successful practices and tools identified during the pilot project. By encouraging more

jurisdictions to use the same or similar processes, tools and forms where possible, compliance will be simpler for market actors, as enforcement will become more consistent.

The CI subprogram supports proactive building departments that seek general improvements to operations and compliance improvement processes. The rationale is based on the recognition that building departments are facing increased economic pressures and resource constraints, with no reduction in the required workloads. Given that this trend is unlikely to change in the near future, utility assistance in improving the efficiency of building department enforcement processes will effectively provide the jurisdiction with more resources to increase compliance rates. The CI subprogram will identify and create tools to help optimize existing processes and simplify enforcement and work with staff to test and modify the tools as necessary. Tools might include, but are not limited to, electronic forms, tracking software, or implementing online permitting and payment methods.

In addition to supporting the CPUC's impact evaluation, which will involve establishing pre- and post-program compliance rates per participating jurisdiction, the IOUs will document training and other efforts employed, administer pre- and post-tests to gauge training participants' knowledge swing, and gather and measure implementation of action plans from participating building departments.

**Reach Codes (RC) Subprogram**

The RC subprogram will focus primarily on developing and/or supporting the development of reach codes,or locally adopted ordinances, that exceed statewide minimum requirements. Reach codes are typically codes adopted by local governments and provide a means to test new codes as well as testing the efficacy of increasing the stringency of existing codes at a local level prior to disseminating the code on a statewide basis. Each jurisdiction's experience with local codes can be used to inform the state's process by documenting both the successes and barriers faced for both adoption and implementation. The RC subprogram will encourage local governments to first optimize compliance with existing codes, and will provide training and resources where applicable.

The IOUs have worked with local jurisdictions (cities, counties, school districts, colleges and universities, etc.) to implement a more coordinated approach to development and implementation of local ordinances to minimize market actor confusion. In addition, IOUs have and will continue to promote regionally consistent ordinances where possible to reduce the duplication of efforts that results when individual government entities develop the language and technical supporting documentation independently. This duplication can even occur in regional government organizations whose geographical boundaries aren't consistent with the CEC's climate zone designations. Lastly, coordinated development provides better staging for statewide adoption, leverage for local jurisdictions to encourage adoption, and increases the likelihood of adoption and compliance.

Working with local jurisdictions and other market actors, the IOUs will develop a package of climate-zone based reach codes for new construction as well as some existing buildings. The IOUs will continue to work closely with the CEC to expedite the CEC review and approval process and to drastically reduce local government development costs and facilitate subsequent adoption of the code(s). Reach codes may also include codes targeting government-owned buildings or particular activities such as commissioning.

The main enabling assumption for the RC subprogram is a continuation of the CPUC policy directive that allows constituents in jurisdictions with local ordinances to participate in voluntary programs without being classified as free riders. The CPUC, along with utilities and local governments recognize that this policy is necessary, especially in light of the long-term strategic policies that must be implemented to reduce California's Green House Gas (GHG) emissions sufficiently to meet statewide reduction goals as set forth by AB32. Otherwise, the effective result "punishes" innovators and market leaders by eliminating access to incentive and rebate programs to assist these leaders in achieving additional energy savings. In most cases, reach codes are adopted based upon the expectation of continuing eligibility for incentives and rebates.

The program assumes that citizens of a jurisdiction or agency that passes a reach code continue to be deemed eligible participants in incentive and rebate programs administered under the auspices of the CPUC, consistent with the treatment of California-owned buildings responding to Governor's Executive Orders (S-20-04 and B-18-12) requiring state buildings to reduce energy usage by 20% by 2015. This interpretation can set up a positive energy efficiency feedback loop wherein participation in incentive and rebate programs increases because of the reach code, and the availability of incentives and rebates to assist code compliance encourages more local governments to adopt a reach code.

**Baselines**: For new construction (including renovations, additions, and replacements) reach codes, the IOUs assume Title 24 as the baseline. A Title 24 baseline provides a conservative savings estimate, is consistent with new construction incentive programs, and eliminates any potential overlap with the Compliance Improvement savings claims.

Time-of-Sale (TOS) reach codes for existing buildings assume that no energy actions are undertaken absent the code. There are currently only two TOS codes that the program is aware of in California. The scopes are both very limited, and in at least one case, the code is not routinely enforced. Therefore, assuming that building owners do not undertake any energy efficiency retrofits at TOS absent a specific requirement is a reasonable assumption consistent with the rationale for the proposed new construction reach code baseline.

Enabling assumptions include a "shared savings" claim mechanism for attributing savings impacts resulting from reach codes. In a jurisdiction with a reach code, savings resulting from participants in the relevant incentive or rebate program (new construction or retrofit) will be claimed by that program, consistent with current practice. Savings

resulting from completed projects that do not participate in an incentive or rebate program will be claimed by either the Codes and Standards or Government Partnership programs if one is extant.

In addition to local governments, various agencies such as school districts, colleges, universities, and industry groups are adopting reach-code policies. Examples include:

- CHPS (Collaborative for High Performance Schools) as adopted by school districts
- Green building requirements adopted by the UC, CSU, and community college districts
- LEED and GreenPoint Rated as adopted by various agencies, builders and jurisdictions
- ASHRAE Standard 189: High Performance Green Buildings, is expected to be adopted by agencies and local jurisdictions

In many cases, the IOUs were involved in the development, adoption, and deployment of these reach code programs. The primary intent of the IOUs involvement was to increase participation in EE programs. The impact of these programs needs to be recognized in the evaluation process as they tend to raise the baseline for code compliance for program participants and non-participants. For example, the baseline for schools in a district with a CHPS policy resolution may have a much higher efficiency baseline as a result of the efforts of the IOU from participation in both the Savings By Design program and CHPS even though there was no legal requirement to exceed the code.

Going forward, the C&S program will be working on the development of new and updated reach code rating systems, standards, guidelines, most of which be based upon the new Title 24 standards. These reach codes are expected to be adopted and implemented with the support of the C&S program by various agencies, institutions, and building associations. Although there have been cases where the mere adoption of reach code programs have little to no impact, there have been a number of cases where significant savings have been verified.

Examples of where verification processes are in place include the CHPS Verified program and the CHPS deployment at Los Angeles Unified School District (LAUSD). The CHPS Verified program (http://chps.net/chps_schools/Verified.htm) provides project review, design review, and construction review of school projects to verify compliance with CHPS requirements. This is a fee-for-service program that provides a rigorous review of the project prior to Department of State Architect (DSA) plan review which generally results in the overall reduction in time and cost for the school design and construction process. In the case of LAUSD, the District worked with consultants (including Global Green) to integrate CHPS into their internal quality assurance process that involved the design teams and all LAUSD design, construction review, and maintenance and operations staff. The C&S program proposes to review these and

similar compliance improvement programs and processes and will implement them accordingly to maximize the energy savings associated with the reach code programs.

To the extent that the C&S program is able to increase compliance with these reach code programs, the resulting savings should be reflected in buildings that result in above-code performance. In addition, to the extent that the IOUs were and will be involved with the development and deployment of these reach-code programs, the energy savings should be treated similarly to the reach code ordinances adopted by local government jurisdictions.

Based upon precedents that allow eligibility for above-code incentives for state and federal agencies with executive orders (e.g., Governor's Executive Order (S-20-04, recently replaced by B-18-12) requiring state buildings to reduce energy usage by 20% by 2015) for mandatory above code construction of their buildings, the IOUs propose continuing the policy of treating these reach code policies in a similar manner.

**Planning and Coordination Subprogram**

The ambitious goals set by the CPUC and CEC require the participation of many different entities. Without proactive coordination, it will be difficult if not impossible to fully realize the savings from the C&S program activities as well as other programs. The C&S program will facilitate coordination and develop and implement a strategic vision to promote and advance cost-effective technologies.

The Planning and Coordination subprogram will work with the CEC, CPUC, emerging technologies, as well as voluntary programs to create a strategic approach for key measures and technologies in support of the Zero Net Energy (ZNE) and other policy goals. For those key technologies, the C&S program will strive to work with other programs to commercialize them for adoption into a relevant code or standard.

The Planning and Coordination subprogram will also work with other programs and market actors to improve code compliance, conduct more outreach and solicit additional input on code enhancement proposals from impacted industries. As part of the expanded outreach and communications efforts, the C&S program will establish and maintain a codes and standards collaborative, and will continue to facilitate the Compliance Advisory Group. In addition, the C&S program will maintain regular contact with state and federal code-setting agencies to minimize duplication of efforts and coordinate activities.

d) **Advancing Strategic Plan Goals and Objectives**

Through the C&S program, SCG, SDG&E, SCE and PG&E will combine advocacy, compliance improvement and reach code development efforts to meet the codes and standards goals defined in the Strategic Plan in Section 7. Please see Section 6 for the specific action strategies the IOUs will employ in order to meet the Strategic Plan's codes and standards goals.

Due to the long code upgrade cycle, the process of developing CASE and research studies may extend past the end of the program cycle; therefore, funding committed prior to the end of 2011 will be available for four years thereafter to fund these studies. This might entail moving the committed funds forward into subsequent program cycles until these studies are completed.

## 6) Program Goals, Objectives and Action Strategies

### a) Subprogram Descriptions

The C&S program consists of five subprograms:
Building Codes Advocacy; Appliance Standards Advocacy; Compliance Improvement; Reach Codes; and, Planning and Coordination.

1. Building Codes Advocacy Subprogram

   The Building Energy Codes Advocacy subprogram primarily targets improvements to Title 24 Building Efficiency Regulations that are periodically updated by the California Energy Commission (CEC). The subprogram also seeks changes to national building codes that impact CA building codes. Advocacy activities include, but are not limited to, development of code enhancement proposals and participation in public rulemaking processes. The subprogram will coordinate or engage with ratings organizations that are referenced in Title 24; for example, the National Fenestration Rating Council, and the Cool Roof Rating Council.

2. Appliance Standards Advocacy Subprogram

   The Appliance Standards Advocacy subprogram targets both state and federal standards and test methods: improvements to Title 20 Appliance Efficiency Regulations by the CEC, and improvements to Federal appliance regulations by the US Department of Energy. Advocacy activities include, but are not limited to, development of code enhancement proposals and participation in the public rulemaking process (Title 20), and comment letters based on IOU research and analysis (USDOE), participation in direct negotiations with industry, and development of quasi-mandatory appliance standards reach codes. Additionally, the subprogram monitors state and federal legislation and intervenes, as appropriate.

3. Compliance Improvement

   The Compliance Improvement subprogram is a new subprogram that combines the previous Extension of Advocacy and Compliance Enhancement subprograms. It provides education, training, and other activities targeting building departments and other industry actors responsible for compliance with Building Energy Code and Appliance Standards requirements. Activities may include development of "best practices tools" and other infrastructure elements that serve multiple compliance improvement objectives.

4. Reach Codes

   The Reach Codes subprogram provides technical support to local governments that wish to adopt ordinances that exceed statewide Title 24 minimum energy efficiency

requirements for new buildings, additions, or alterations. Support for local governments includes research and analysis for establishing performance levels relative to Title 24 and cost effectiveness per Climate Zone, drafting of model ordinance templates for regional consistency, and assistance for completing and expediting the application process required for approval by the CEC. The subprogram also supports local governments that seek to establish residential or commercial energy conservation ordinances for existing buildings.

5. Planning and Coordination

   The Planning and Coordination Subprogram supports planning activities that improve alignment across the IOU energy efficiency portfolio with respect to future C&S program activities. This subprogram supports efforts to prepare the market for future code adoption (i.e., improve code readiness), to ensure higher code compliance rates and advance the CPUC Strategic Plan goals for achieving zero net energy.

b) **Program Goals and Activities**

In general, the goals of the C&S program are the same as the two C&S goals defined in the C&S section of the Strategic Plan. Through the Advocacy subprograms, the IOUs will strive to continually strengthen and expand building and appliance codes and standards as IOU efforts reveals greater efficiency opportunities and compelling economic benefits. Through the Compliance Improvement subprogram, the IOUs will strive to improve code compliance through education, outreach, and other technical resources. IOUs will also develop local ordinances and facilitate their adoption and implementation in motivated communities.

- Strategic Plan Codes and Standards Goal #1: Continually strengthen and expand building and appliance codes and standards as market experience reveals greater efficiency opportunities and compelling economic benefits. (Subprograms 1 and 2: Building Codes and Appliance Standards Advocacy).
- Strategic Plan Codes and Standards Goal #2: Improve code compliance and enforcement. (Subprograms 3 and 4: Compliance Improvement and Reach Codes).

The following sections provide a description of the proposed C&S subprogram activities which will lead to achieving the program goals.

**Building Codes Advocacy**

The Building Codes Advocacy program will continue conducting many of the same activities as were conducted in the 2010 – 2012 program cycle, but will focus on the upcoming 2016 Title 24 Energy Building Code cycle. In addition, the Building Energy Codes Advocacy subprogram will expand activities at the national level. Primary activities for 2013-2014 include the following:

2013 Title 24 Building Codes

- Support implementation of adopted 2013 Energy Building Code:
  - Complete revisions to compliance manuals and forms.

2016 Title 24 Building Codes

- Prepare CASE studies in coordination with CEC:
  - Conduct research for 2016 building code advocacy to advance State policy goals.
  - Support activities to address Department of Finance review requirements.
  - Research residential ventilation / IAQ requirements to reduce and control. infiltration while maintaining and improving indoor air quality.
  - Research and advocate methods to remove code barriers to the increased use of renewable energy in support of ZNE goals.
  - Support development of 2016 compliance software.

**Appliance Standards Advocacy**

The Appliance Standards Advocacy subprogram will continue conducting many of the same activities as were conducted in the 2010–2012 program cycle, but will focus on preparing new measures pursuant to CEC's adopted Order Instituting Rulemaking (OIR) for Title 20 Appliance Standards and U.S. Department of Energy's ongoing rulemaking for Federal Appliance Standards. Primary activities for 2013-2014 include the following:

Title 20 Appliance Standards Rulemaking

- Prepare CASE studies pursuant to CEC's adopted OIR:
  - Advocate and provide public testimony in State public proceedings
  - Conduct research and testing and submit supporting market and technical data to the CEC
  - Participate in consensus negotiations with industry and energy advocacy groups (which typically develop standards levels which CEC eventually adopts)
  - Develop quasi-mandatory reach codes that are voluntary with respect to participation, but require CEC certification if a supplier chooses to participate.

Federal Appliance Standards Rulemaking

- Provide support to DOE rulemaking process:
  - Advocate and provide public testimony in Federal public proceedings.
  - Submit supporting market and technical data to the Department of Energy (DOE).
  - Participate in consensus negotiations with industry and energy advocacy groups (which typically develop standards levels which DOE eventually adopts).
  - Develop voluntary agreements or reach standards.

**Compliance Improvement**
For the 2013-2014 program cycle, the combines the former Extension of Advocacy and Compliance Enhancement Program activities into one Compliance Improvement subprogram to enhance understanding of program objectivities and activities. The subprogram will strive to improve compliance with Title 24 and Title 20 standards while implementing an effective sector strategy with the Workforce Education and Training (WE&T) Program. Primary activities for 2013-2014 include the following:

Title 24 Compliance

- Title 24 Standards Essentials Role-Based training for building inspectors:
  - Continue delivering training to plans examiners and energy consultants. Update curriculum to cover what is new in the 2013 code.
  - Expand role-based training curriculum to additional compliance improvement market actors such as the building trades and design professionals as guided by needs assessment.

- HVAC Quality Installation and Other Programs with Direct Code Requirements
  - Identify opportunities to insert code compliance modules in existing curriculum, such as training required for technicians.

- Online Compliance Training:
  - Explore training delivery mechanisms beyond the traditional classroom to include live webinars, activity-based online training, and in-field demonstrations.

- Tools and Process Improvements:
  - Implement tools and process improvements as identified through the building department best practices study and the Compliance Improvement Advisory Group (CIAG).

- Forms and Compliance Documents:
    - Support development of improved forms and compliance-related documentation for 2013 Title 24.

- Compliance Improvement Incentives:
    - Explore a pilot project designed to improve compliance by providing incentives to local governments, contractors, or other key market actors. The pilot will be based on the CIAG's guidance and may include nonmonetary incentives such as training or provision of tools designed to streamline the permitting and inspection processes for building additions and alterations.

- Target Low Compliance Problem Areas:
    - Collaborate with the CEC to identify problem areas and potential compliance improvement solutions through white papers developed by CIAG members.
    - Consider pilot project to improve compliance for measures with known challenges, which may include providing incentives to contractors for pulling permits, or motivation for other market actors.
- Develop and Conduct Outreach Campaign to Improve Compliance:
    - Collaborate with the CEC to develop and implement an outreach campaign designed to improve compliance with Title 24 and Title 20 standards. The campaign will be based on the CIAG's guidance and may include activities such as developing flyers for contractors to provide to potential customers explaining the code requirements and benefits, mini measure-based code seminars for big box store employees, etc.

- CEA exam development, facilitation support, and maintenance
    - Collaborate with the California Association of Building Energy Consultants to improve the working knowledge, skills, analytic ability and accountability of individuals using energy compliance software and preparing the appropriate Title 24 documentation for permit submittal. The C&S program will support updating the beta Residential and Nonresidential CEA examinations developed in 2010-2012 to properly test applicant CEAs under the 2013 standards and facilitating the roll out of the new certification process.

Title 20 and Federal Standards Compliance

- Surveys and Technical Support:
    - Conduct surveys and provide technical support to CEC and industry to facilitate compliance.

- Education and Outreach:
    - Collaborate with CEC on implementing an education and outreach campaign targeted to distributors, retailers, contractors, and possibly consumers.

**Reach Codes**

For the 2013-2014 program cycle, the IOUs will continue to collaborate with the CEC and Local Government Partnership Program to identify, and provide technical assistance to, local jurisdictions interested in adopting reach codes. In addition, the IOUs will continue to collaborate with CEC to provide support for developing voluntary standards to encourage buildings to achieve exemplary performance in the areas of energy efficiency. Primary Reach Code subprogram activities for 2013-2014 include the following:

Reach Code Technical Assistance

- Cost Effectiveness Studies:
    - Prepare Cost Effectiveness studies for each of the California climate zones (to be updated for 2013 Energy Building Code) that have been vetted with the CEC, resulting in expedited CEC review of reach code application submittals.

- Policy Guidelines:
    - Provide a "Road Map" of Policy Guidelines for adopting Reach Code including an overview of some of the implications and important choices in writing and adopting these types of ordinances, and recommendations intended to improve implementation and compliance.

- Ordinance Template:
    - Provide a Reach Code Ordinance "template" that establishes clear definitions of when the ordinance is triggered, including CEC-required language which states that all buildings shall meet all applicable requirements of the Building Energy Code.

- Workshops & Presentations:
    - Facilitate public workshops and presentations to interested stakeholders including elected officials, city staff, industry organizations, and community groups that address the following:
        - Critical role that energy efficiency plays in reducing greenhouse gas emissions
        - Understand how Reach Codes and complementary new construction incentive programs such as the California Advanced Homes (CAHP) program help meet CalGreen's voluntary Tier 1 and Tier 2 Energy requirements, accelerate advancement of zero net energy building practices, and mitigate project-level GHG impacts pursuant to CEQA requirements.

        - Explain the process for developing and adopting a legally enforceable reach code pursuant to CEC requirements
    - Work with industry organizations and other market actors to conduct outreach to local governments to inform them of available reach code assistance.

Local ordinances may be structured in several ways, and often vary in scope, requirements, and triggers. The C&S team will encourage local governments to adopt regionally consistent ordinances where feasible to reduce potential market confusion. However, differing circumstances in each jurisdiction may require them to pursue different avenues. For example, ordinances may be limited to energy issues only, or may be more comprehensive, also including other green building measures. Some examples of typical variations in ordinances include the following:

- Scope and Triggers: Local ordinances may include residential, nonresidential, or municipal buildings, or any combination of the above. Many local ordinance requirements apply to new construction only, while others also include remodels. Triggers may include project size, scope, or value.
- Requirements: Local ordinances typically specify a particular level of performance, allowing builders and designers to achieve the desired performance using a combination of measures and technologies that are appropriate for the project. Many local ordinances specify that covered projects exceed state requirements by a specific percentage (15% was the most common requirement relative to the 2008 Standards). In addition, local ordinances may require projects to meet CalGreen Tier 1 or Tier 2 advanced efficiency levels as well as the non-energy portions of CALGreen. Another common structure employed by many local governments is to require buildings to obtain certification from a relevant green building rating system such as LEED or Build It Green. This structure allows the jurisdiction to leverage the documentation and verification requirements inherent in these systems, thus reducing the verification burden on the building department.

**Planning and Coordination (Non-Resource Subprogram)**
The Planning and Coordination subprogram supports planning activities that improve alignment across the IOU energy efficiency portfolio with respect to future C&S program activities. The C&S staff will coordinate with IOU energy efficiency portfolio programs to support efforts to prepare the market for future code adoption (i.e., improve code readiness), to ensure higher code compliance rates and advance the CPUC Strategic Plan goals for achieving zero net energy.

This subprogram will consist of four elements: 1) Strategic planning and coordination; 2) Outreach within each IOU to other program areas; 3) Statewide planning and coordination; and, 4) Workforce education and training. Primary activities for 2013-2014 include the following:

<u>Strategic Planning</u>

- Codes and Standards Collaborative:

- Maintain a Codes and Standards Collaborative to conduct strategic planning.

- Code Readiness:
  - Establish cross-functional teams, including representatives from voluntary programs (incentive, emerging technologies, and education and training), the CPUC, and the CEC, will be established to identify code readiness priorities relative to policy goals, for example: zero net energy, AB 1109, and other Action Plan objectives.

Internal Coordination and Communications

- Periodic Meetings:
  - Conduct a variety of internal coordination activities based on respective needs of each IOU, including periodic meetings with program leads in other areas as well as management teams.

- Ongoing Communication:
  - Inform planners and support groups regarding future code changes, collaboration on evaluation and regulatory matters.
  - Solicit input from other groups re advocacy efforts, aligning education and training activities with incentive programs.

Statewide Collaboration

- Integrated Dynamic Approach to Portfolio Planning:
  - To support the state's zero net energy objectives, the C&S team will work closely with new construction programs to develop an integrated approach to align new construction program offerings with base code requirements as well as reach codes where possible.
  - The C&S team will work with core retrofit programs as well as local government partnerships and third parties to coordinate offerings with anticipated code changes.

- CPUC Communication:
  - Conduct monthly calls with CPUC personnel to share progress and discuss issues.

- CEC Communication:
  - Maintain statewide weekly calls with CEC staff regarding building codes and appliance standards.

- National Stakeholders Communication:

- Conduct regular conference calls with national stakeholders regarding appliance standards.

- Compliance Advisory Group Communication:
  - Host quarterly meetings with Compliance Improvement Advisory Group regarding compliance improvement activities.

- Local Government Partnership Communication:
  - Provide quarterly updates to Local Government Partnership Program regarding reach code adoption progress and delivery of training to building departments.

Workforce Education and Training (WE&T)

- Sector Strategies for WE&T:
  The C&S and WE&T teams will meet periodically to coordinate activities that will enhance support for the appropriate market actor roles responsible for new and emerging codes and standards implementation according to priorities established by needs assessments. The C&S program will collaborate with the WE&T Centergies subprogram to not only prepare contractors and technicians to implement current codes, but to also prepare them with technical training on advanced technologies that are projected to become part of reach codes and then the statewide code.

c) Program objectives (more specific milestones to be achieved to accomplish the goals)
See Codes and Standards Alignment with Strategic Plan narrative and table below.

d) Program action strategies that will be used to implement the goals
See Codes and Standards Alignment with Strategic Plan narrative and table below.

e) Program outputs (measurable results of the program linked to the action strategies)
See Codes and Standards Alignment with Strategic Plan narrative and table below.

**Codes and Standards Alignment with Strategic Plan**

The following narrative and table details the specific actions the C&S program will use to carry out the C&S goals defined in the Strategic Plan and the program outputs linked to each action strategy.

In addition to striving to meet the two C&S goals defined in the Strategic Plan, the IOUs will work in concert with other programs within the energy efficiency portfolio to help meet associated goals such as those defined for HVAC, local governments and WE&T as described in Section 8 of this PIP.

Strategic Plan Codes and Standards Goal #1: Continually strengthen and expand building and appliance codes and standards as market experience reveals greater efficiency

opportunities and compelling economic benefits. (Subprograms 1 and 2: Building Codes and Appliance Standards Advocacy)

The C&S program will provide a direct response to the CPUC's goal by specifically addressing each near-term strategy in the Strategic Plan. Through the advocacy activities, the program will:

- Continue to expand Title 24 Building and Title 20 Appliance Efficiency Regulations through improved research to identify current code and compliance shortcomings, new technologies and processes, and latest thinking on breadth (scope) and depth (stringency) of possible standards
- Develop aggressive proposals to accelerate regulations for both Title 20 appliance efficiency standards and Title 24 building standards
- Support leading activities such as statewide reach standards (e.g., codes that include California Green Building Standard) and the coordinated development and adoption of advanced local government ordinances.
- Coordinate with both internal and external organizations on an ongoing basis, including voluntary programs and national standards organizations

The Strategic Plan outlines five strategies to strengthen and expand building and appliance standards. The C&S program intends to address each strategy through the advocacy subprograms as follows.

*Strategy 1-1: Develop a phased and accelerated approach to more stringent codes and standards.*

The C&S program seeks to accelerate the adoption of increasingly stringent building and appliance standards. To this end the program will develop proposals to increase the scope and stringency of Title 20 and Title 24. The C&S program will also develop or support development of more stringent codes, such as the California Green Building Standard, ASHRAE Standard 189, and other model code ordinances, which would significantly exceed the current Title 24 requirements and could potentially become a model for local green building ordinances.

The use of discrete, above minimum code tiers of efficiency standards (e.g. reach codes) have been proven to be an effective way to promote energy efficiency, prepare the market for high efficiency equipment in an orderly way and smooth the transition for more stringent future standards. However, the proliferation of many standards for the same product renders confusion in the market place and hinders compliance. The C&S program will work with local governments that currently have or are considering adopting advanced energy codes to identify common themes among their primary objectives and develop a set of model reach codes and standards that form the path for subsequent statewide adoption. The C&S program will help local governments improve compliance by developing compliance forms, modify performance software, and provide code compliance training to practitioners and building departments

Historically, approximately 100,000 single family (SF) homes and 50,000 multi-family (MF) dwelling units are constructed each year. Estimated construction for 2009 is projected to be much lower: SF 30,000 SF units and 33,400 MF units.[2] These buildings are within the scope of the Title 24 energy code. There are about 8 million existing single family homes and 4 million existing multi-family dwelling units in California.[3] Since homes are sold on average every seven years in California[4], approximately 1.4 million existing homes and (assuming same turn-over for rental properties) 570,000 existing multi-family units are sold each year. Thus requirements for the most basic efficiency measures (attic insulation, weather sealing) installed at time of sale would have a huge impact – potentially impacting 10 times as many residential buildings as do the current residential standards. The C&S program will work with local governments to identify existing barriers and develop model time-of-sale (TOS) requirements such as Home Energy Rating System (HERS) audits, and commissioning for commercial buildings that do not unnecessarily hinder real estate transactions or financing. Ultimately, if the pilot program with local governments is successful, it will make the case for a statewide time-of-sale requirement.

**HVAC.** The efficiency of heating and cooling systems is central to building energy efficiency standards and has become an even more significant component of the standards through the adoption of time-dependent valuation. Energy losses from ducts can be a large fraction of heating and cooling loads. The Title 24 standards have mandatory requirements for duct sealing and prescriptive requirements for duct testing and verification by a HERS rater. Feedback from duct tests to HVAC contractors and home builders is a very important mechanism for transforming the market. Thus, the C&S program will be pursuing the concept of mandatory requirements for duct testing and self-certification of the test while still including the prescriptive requirement for a HERS rating. Similar to the acceptance tests in the nonresidential market, a self-certified duct pressurization test would be required for all residential duct systems in unconditioned spaces that are not obtaining a HERS verified duct test.

The systems not receiving HERS duct sealing verification would receive the same energy penalty in the performance approach and the systems would not be allowed in the prescriptive method approach. This requirement would reduce enforcement uncertainty – every duct system would be required to be tested. Since all duct systems are required to be tested, this lowers the incremental cost barrier for a HERS verified duct test and assures that mechanical contractors and homebuilders receive the feedback from duct testing on every job. This same approach would be taken for relatively new requirements for measurements of airflow, fan power, duct pressure drop and refrigerant charge.

[2] Construction Industry Research Board, California Construction Review, Private Building Construction, January 22, 2009.
[3] http://www.dof.ca.gov/HTML/DEMOGRAP/ReportsPapers/Estimates/E8/E-8.php
[4] Median duration at residence is 7 years for homeowners and 1 year for renters. Jason P. Schachter and Jeffrey J. Kuenzi. US Census. Seasonality of Moves and The Duration and Tenure of Residence: 1996, data extracted from Figure 4. Duration of Current Residence by Current Tenure: 1996.
http://www.census.gov/population/www/documentation/twps0069/twps0069.html

The C&S program will prepare CASE studies to evaluate the cost-effectiveness, market status and availability of the equipment to determine the potential for revising the building efficiency standards so they are based on enhanced efficiency HVAC systems such as: radiant cooling with a dedicated outside air system, evaporative condensing, direct/indirect evaporative cooling and ground coupled heat pumps. These and other cooling technologies have the potential to be significantly more efficient than the federal air conditioning regulation but may be exempt from federal pre-emption. For federally-regulated cooling equipment, the C&S program will continue working with the federal DOE to develop regional air conditioning standards that would be more appropriately suited to California's warmer and drier climate.

**Envelope performance testing.** Similar to the requirements for performance testing of HVAC installations, the performance testing of the envelope of homes and other residential dwelling units provides direct feedback on the level of infiltration. Thus, testing could transform the building industry. The C&S program will evaluate the feasibility of adding mandatory requirements for blower door tests for all new homes. Similar to the requirements for duct testing, the prescriptive baseline would retain the HERS verification requirements, but for those homes wishing to avoid the HERS requirements through a performance trade-off the blower door test would still have to be performed.

*Strategy 1-2: Expand Titles 24 and 20 to address all significant energy end uses*

The C&S program will pursue additional energy savings by broadening the scope of the Title 20 appliance standards and the Title 24 building efficiency standards. Title 20 proposals will be developed and supported through the public stakeholder process for both current and future proceedings. Current proposals include: battery chargers, portable lighting fixtures, set top boxes, televisions, computer monitors, game consoles. Future proposals will include office equipment and other miscellaneous and plug loads. Integration activity with voluntary codes and program activities will be increased to expand potential for new product categories to be added to the measure list. The C&S program will continue to support the Title 20 proposals after their adoption by providing ongoing technical assistance to the CEC to fend off post adoption maneuvering by oppositional stakeholders, which has increased in recent years. This will reduce post adoption exemption of product classes.

For the 2008 revisions to Title 24, the C&S program successfully proposed a bold increase in scope to include refrigerated warehouses. For 2013, the C&S program again advocated increasing the scope of the standards, this time to include the refrigeration plant small walk-in refrigerated coolers and refrigerant plants serving display cases in supermarkets. The C&S program is also pursuing other opportunities with computer room cooling, and other process measures such as compressed air systems.

In the past, energy codes have focused only on the efficiency of the equipment installed and not on how that equipment functions, and recent field studies have found that a significant number of controls do not work correctly. Thus the C&S program will be

reviewing the efficacy of fault detection and diagnostic (FDD) controls to determine their effect on operators taking subsequent action to correct the problem when notified. The C&S program will also investigate barriers to submetering tenant units and major building energy consuming systems such as lighting, chiller plants, and boiler plants. Pending approval from the CPUC that water savings are within the scope of IOU energy and resource conservation programs and should be pursued, the C&S program will research requirements for water meters on all new buildings.

With the current federal administration's focus on energy efficiency we can expect, at a minimum, more opportunities to increase the stringency of Title 20 standards though Federal proceedings. If the new administration increases the budget for DOE staff, we can expect an even greater acceleration in activities than the already rapidly increasing number of DOE proceedings. Increased DOE funding would provide the opportunity for states to petition DOE for new rulemakings and/or waiver petitions in support of California energy savings.

The C&S program will work in conjunction with national organizations to align California's reach goals with LEED, Green Globes, and CHPS. Ideally, satisfying California's Green Building Standard would become the minimum threshold to apply for a LEED rating. Likewise, the C&S program will work with ResNet and California HERS Providers on the development of further home rating system upgrades and rating techniques.

*Strategy 1-3: Improve code research and analysis.*

Research and analysis is the basis of upgrading energy codes. In some cases this research is forward-looking and identifies technologies that have sufficient market experience, cost-effectiveness and broad applicability to be deemed "code-ready." This research can also be retrospective for two major categories of energy savings opportunities:

1. Review of code proposals that were unsuccessful in past code cycles, but appear to have promise due to changes in the market, refinements in the technology or new information.
2. Evaluation of current standards for loopholes, inconsistencies, enforcement barriers. The savings from these issues can be substantial and must be actively researched.

More generally, the program will seek to improve C&S advocacy by developing new approaches to determining incremental costs, availability, and reliability. In particular, cost information is considered confidential by industry representatives who generally oppose code upgrades, so the success or failure of a standards proposal often turns on the perceived accuracy of incremental costs.

Due to the increasing complexity of the targeted measures and increasing sophistication of oppositional stakeholder tactics during the public process under both Title 20 and 24, a greater emphasis on more thorough market research, product performance measurement

and technical production data is necessary. Existing studies may be expanded, new studies may be designed and implemented, and additional market research may be purchased to facilitate future standards development. New or updated test methods are required to pursue significant savings opportunities left stranded by current incomplete test methods (e.g., high temperature performance metrics for cooling systems and variable speed capability of commercial refrigeration equipment).

Codes research also needs to consider more than just technologies but also design methods. A "big bold" research topic for Title 24 is a whole building approach to building design. This concept is in support of a requirement for compresssorless or "hybrid" cooling systems in the homes in the more temperate California climate zones. Well-designed homes in the mild coastal regions of California do not need air conditioners. These homes often have thermal mass to dampen the diurnal temperature swings when it is hot outside, so the thermal comfort of the home isn't solely dependent on the air temperature of the home, but also the radiant temperature. The C&S program will pursue the potential of providing Title 24 compliance credit to homes that do not have air conditioners as long as it can be reasonably expected that occupants in these homes will be comfortable enough that these homes will not be retrofitted with air conditioners later on. This approach would likely require an enhancement of the existing performance method simulation tools, or require newer simulation tools such as Energy Plus, that has a thermal comfort model. This would require a significant investment in resources. However, if this concept were implemented, it would move new homes in coastal regions significantly closer to the 2020 zero net energy goal.
This same concept can also be applied to commercial buildings with greater attention given to comfort due to tasks being conducted in fixed positions and locations, and greater attention to internal heat gains resulting from plug loads and lighting loads. However, better thermal mass and comfort models will advance low energy commercial buildings as this would also benefit the characterization and ultimately the design of passive solar commercial buildings assisted with radiant heating and cooling. Energy Plus also promises the capability of modeling airflow which should provide improved confidence in specifying two other low energy HVAC systems: positive displacement ventilation and natural convection.

Initially, advanced tools require advanced users. Thus training in low energy design principles and methods of predicting building performance training is needed for the next generation of architects and engineers starting out in practice and currently attending California architecture and engineering schools. Training is needed in a number of different venues: for existing practitioners, training opportunities at utility training centers, and at professional conferences. Student training would be most efficiently conducted as part of their normal curriculum. Sponsored curriculum development and sponsored research in the design of efficient buildings results in career long impacts when combined with other broader society-wide incentives for low energy design.

Even more advanced interfaces to these tools expand the scope of potential users by simplifying the user's inputs, but requiring sufficient detail in the nomenclature used by designers so these tools can predict the energy impact of design choices with reasonable

levels of accuracy. These program interfaces must have enough flexibility so the breath of applications is wide enough to affect a sizable portion of the possible building applications and the scope of measures is sufficiently broad. Training is still needed for these simplified tools but is accomplished in less time and is given to more people as there are more people likely to use the tool. Easier to use tools expands likely users to sales people, manufacturer representatives and facility managers.

In addition to the fairly sophisticated tools to support these advanced designs, a segment of the market will be drawn to design approaches that are formulaic. These approaches may not optimize energy savings, but if the prescriptive cookbook method is well designed, they can yield significant levels of reliable savings. This requires a significant effort in exercising the design tools, comparing the simulated results to actuals and synthesizing the results into design standards. These design patterns then must be transmitted in a number of ways including resource documents, training materials and presentations.

The energy consumption of buildings is not purely a function of their components but is impacted by occupant behavior and actual equipment installation and performance. Field studies are an important method of feedback on how much energy is really saved by a measure. In some cases this research can leverage information from CPUC EM&V studies and CEC load forecasting studies.

Another significant source of market and technology data is the utility energy efficiency programs. The C&S program will periodically poll the program managers for information concerning market share, technology cost and verified energy savings. The energy efficiency programs will likely identify technologies that may be ripe for code adoption and can help develop the market experience that differentiates those products that are truly code ready.

The importance of the statewide utility Emerging Technology (ET) program will increase as source of information and potential measures for voluntary reach-code tiers. Although available in the market, the measures that are assessed in the ET program may be neither cost-effective nor fully applicable for mandatory standards. In some cases, it may be appropriate to have measures simultaneously included in utility energy efficiency programs as well as a reach code tiers.

Also related to field studies are process evaluations of how the code is administered from the designer and specifier, to Title 24 analyst, to plan check, to bidding, through construction to inspection to occupancy. The delivery of efficient buildings relies on each step of this process. Transferring this information to the CEC and code proposal developers increases the likelihood that compliance will increase with the next energy code.

*Strategy 1-4: Improve coordination of State energy codes and standards with other state and Federal regulations.*

The development of the California energy efficiency standards does not occur in a vacuum. Much of the technical basis of Title 24 rests on consensus standards developed by ASHRAE (American Society of Heating, Refrigerating and Air-conditioning Engineers) and IESNA (Illuminating Engineering Society of North America.). The measurements of product properties rely on test standards developed by DOE; American Society for Testing and Materials now referred to as ASTM International (ASTM); Air-Conditioning, Heating and Refrigeration Institute (AHRI); National Fenestration and Rating Council (NFRC); Cool Roof Rating Council (CRRC). Although the C&S program works most closely with the CEC, other California state agencies are also involved with the development of efficiency standards. Examples of coordination with other state agencies may include, but are not limited to, the California Air Resources Board (CARB) as codes relate to greenhouse gas (AB 32) and other emissions, Department of Toxic Substance Control (DTSC) as codes relate to toxic waste from lamps, and California Department of Water Resources (DWR) as codes relate to the water use in HVAC systems. In addition, there is much to be learned and many benefits derived from coordinating with ASHRAE and other states that are developing their own energy codes. Thus, the C&S program will be coordinating with other entities in the development of test standards and other consensus standards.

The C&S program will also participate in the development of other standards that can then be applied in California. The most notable of these is the Federal appliance efficiency regulations and international standards, which are likely to have bigger impacts on Federal and state appliance standards in the future. If the C&S program continues to influence the outcome of these regulations, nominal savings in California will be achieved. Since the Federal regulations apply to all sales in the US, compliance enforcement is easier. The program will continue to take a leadership role in advocating for new legislated standards (often based on Title 20 standards in the past) and in both negotiated and contested DOE appliance standards rulemakings. In view of the increasing international coordination in the codes and standards arena, the program will take a more influential role in influencing international test methods and standards framework developments where there is significant opportunity to affect federal and CA appliance standards. We fully expect the need to travel to other countries to conduct effective collaboration and coordination of standards activities that potentially affect California. Increased coordination with national voluntary program frameworks including CEE and ENERGY STAR are also likely to increase codes and standards efficacy.

Federal appliance efficiency standards limitations have been a hindrance to more stringent codes in California. These Federal standards preempt the state from requiring additional labeling, higher appliance efficiency standards, and prevent building efficiency standards from requiring higher efficient equipment than equipment that are minimally compliant with the Federal appliance standards. Given that the Federal regulations cover the largest energy consuming devices (lighting, air conditioners, and water heaters), this has seriously constrained the effectiveness of California's appliance and building

efficiency standards in California. The C&S program will be developing a research plan to address Federal pre-emption including, but not limited to, waiver petitions, federally legislated standards, and development of new coalitions.

The CARB's proposal in response to SB 97, which requires rules be developed to address the California Environmental Quality Act (CEQA) requirements for greenhouse gas emissions, expands the possible scope of energy consumption that could be regulated. Well-defined efficiency measures and performance trade-off options would be in the interest both of CARB and the entity submitting a new industrial, commercial or residential project.

In addition to the coordination with the DWR for the water use in HVAC systems noted above, there is an ongoing CPUC proceeding to determine the amount of energy embedded in water use. Therefore, the C&S program will further coordinate with the DWR as studies are initiated to examine potential reductions in water use. Since the CEC was given jurisdiction over water use starting in 2008, it is anticipated there will be new sections in Title 24 regulating the use of water.

Also as mentioned earlier, the C&S program will pursue developing reach codes in coordination with the California Green Building Standards. To do this the C&S program will coordinate with the BSC (Building Standards Commission), the CEC (California Energy Commission), HCD (Housing and Community Development), OSHPD (Office of Statewide Health Planning and Development), Local Governments, and others.

*Strategy 1-5: Improve coordination of energy codes and standards with utility programs*

Coordination between C&S and other utility programs may occur in various ways: existing or newly adopted standards, future standards, direct linkages between incentive programs and a specific standard, and long-term integrated planning. This is a rapidly evolving area, so planning is necessarily at an objectives level for now. The C&S team will periodically meet with other utility program staff to facilitate ongoing coordination.

**Newly adopted standards**. On an ongoing basis, C&S team communicates with IOU incentive program managers regarding potential adoptions of new standards. Depending on the opportunity, program managers may decide to provide incentives for measures in advance of the effective date to prepare the market.

Education and training between adoption and effective dates of a particular standard represents another way to prepare industry. The C&S program will provide Title 24 training to both market actors and internal program staff in advance of the effective date for the Title 24 Standards. The training will help identify opportunities for ongoing coordination between incentive programs and C&S activities. Another activity under development is to require program participants to complete and submit the applicable acceptance tests required by Title 24 to receive an incentive for HVAC and lighting controls equipment. This will increase compliance with the acceptance tests and help assure the incented equipment is installed according to code intent.

Although all utility programs are impacted by codes and standards, particular focus will be placed on coordinating with the Local Government, HVAC, and WE&T programs. Please refer to Section 8 for how the C&S program will coordinate efforts to help meet shared goals defined in the Strategic Plan.

**Future standards.** Having selected topics for potential CASE study proposals for the next code cycle, for example, 2011 building and appliance standards, energy efficiency program managers may be able to include measures in programs to improve code readiness. The C&S program may also work with statewide ET program staff to identify new technologies for which to develop alternative calculation methods (ACM). CASE studies can be developed for new technologies to propose Title 24 credit towards achieving compliance, thereby reducing one barrier to market acceptance. Moreover, a Title 24 ACM provides an approved method for calculating energy savings for incentive programs.

The C&S program will continue to improve coordination with the statewide new construction programs. Since the success of these programs are dependent on exceeding the current Title 24 codes, they serve as a useful "test-bed" to inform the development of future Title 24 proposals by highlighting the more cost effective measures, flagging problem areas with compliance, and demonstrating the extent to which the current code can be exceeded.

On a longer term basis, it is sometimes possible to identify code objectives two code cycles into the future. This will be particularly critical for developing an appropriate trajectory for reaching the Strategic Plan's zero net energy goals, AB 1109 Huffman Bill goals[5], and state policy initiatives indicated in the previous section. For these opportunities, the C&S program will complete a gap analysis to identify distance between code readiness attributes and the current market status of the technology, which will inform the creation of an integrated long-term coordination plan. Long term information repositories may be developed to collect information that will support adoption in a future code cycle.

**Direct linkages.** The C&S program seeks to directly link, as has been done for the current Title 20 television proposal before the CEC, code proposals with incentive programs. When faced with industry resistance, this linkage constitutes a stronger argument before the commission. Moreover, linking a standard with an incentive program creates a synergy in which the push of a widely recognized future standard reinforces the pull of near term incentive programs, thereby increasing participation in a complementary incentive program.

Albeit weaker compared to direct linkages, the synergy between standards and incentive programs exists more generally through indirect linkages.

[5] AB 1109 Huffman directs the CEC to implement strategies to reduce residential lighting by 50% and commercial and outdoor lighting by 25% by the year 2018.

Strategic Plan Codes and Standards Goal #2: Improve code compliance and enforcement. (Subprograms 3 and 4: Compliance Improvement and Reach Codes)

The C&S program is committed to improving code compliance and enforcement. To demonstrate this commitment, C&S is expanding the CI subprogram. The program will leverage existing, and develop new education and outreach activities to equip both building and appliance industry market actors with the knowledge and tools needed to comply with Title 24 building energy efficiency standards and Title 20 appliance efficiency regulations. Expanding the program to include compliance improvement will help ensure that the full potential of the state's codes and standards efforts are realized, and results in a comprehensive C&S program.

The C&S strategies and activities listed in the Strategic Plan are focused primarily on Title 24 building energy efficiency standards, noting that appliances are principally regulated at the federal level rather than the state level. As the CPUC Strategic Plan also notes, there remains huge potential savings at the state level for appliances and equipment not regulated by the federal government. With this in mind, the C&S program has added activities to capture Title 20 compliance savings as well and added a sixth implementation item for this program cycle in the Strategic Plan Table below to document planned Title 20 efforts.

*Strategy 2-1: Improve code compliance and enforcement.*

The Strategic Plan identifies one strategy and five activities targeted to improve compliance and enforcement with Title 24 building energy efficiency standards. Each activity is addressed in order below.

Activity 2-1 a): Conduct research to determine high-priority tactical solutions for code compliance and focus efforts accordingly.

As a first step in launching compliance improvement efforts, the C&S team will interview the building industry market actors included in the compliance supply chain to determine how their current performance compares to the desired performance, the reasons for the gap, and which performance improvement solutions the C&S program may employ to improve code compliance. Additionally, the team will interview experts who have been providing training, software and regulatory support to industry practitioners over the years to identify best practices, possible points of collaboration and gaps the C&S program can help fill. Furthermore, the C&S program will conduct a process pilot with several local governments to investigate code enforcement processes in detail, identify opportunities to streamline enforcement practices and improve consistency across jurisdictions. Results of these research efforts will inform the total package of performance improvement solutions the program will implement to help improve code compliance rates. In addition, the results of the compliance improvement process study that included a stakeholder roundtable discussion will be compared with the interviews.

Activity 2-1 b): Increase training and support for local building code officials.

Building code officials are the primary key to improving compliance with Title 24 standards and certain Title 20 regulations such as residential air conditioning equipment. Building department personnel must enforce several different building codes simultaneously, with limited resources. Given the limited time available, officials correctly prioritize those codes related to life-safety, which often results in extremely limited time and resources dedicated to enforcing energy-related codes. In addition to resource limitations, energy codes have undergone much more significant changes in each of the recent code updates than most other codes, thus creating a challenge for officials to maintain their expertise.

The CI subprogram will focus a significant percentage of the code education resources on providing training and support to building code officials. Based on research results, the CI subprogram will develop role-based training courses and abbreviated code guidelines for plan checkers, inspectors and counter staff specifically targeting only those sections of the code related to each particular position. This work will be closely coordinated with the CEC and third party efforts to ensure that it supports and is in alignment with the CEC's compliance improvement efforts.

In addition, in response to the needs assessment to be conducted as part of the local government process pilot, the CI subprogram will develop and test process improvement tools, and will work with CALBO, the International Code Council (ICC), and CEC to conduct outreach to other jurisdictions to encourage adoption of those tools. The CI subprogram will conduct outreach and encourage other jurisdictions to adopt tools and processes that help building officials increase compliance. The CI subprogram will support more consistency across jurisdictions, in processes, documentation requirements and enforcement practices, and will encourage the expansion of submitting online permitting paperwork for HVAC replacements as well as other measures. These online submittals allow for the creation of customized inspection checklists that also simplify enforcement.

The CI subprogram will also work with the CEC and HERS providers to ensure the new HERS documentation and data management systems are consistent and serve to streamline the compliance process.

Activity 2-1 c): Investigate regulatory tools such as licensing/ registration enforcement.

Currently, although Title 24 documentation must be signed by a licensed professional, the actual calculations can be prepared by anyone. Anecdotal evidence from rebate programs and building departments indicates that the lack of training and/or professional certification requirements results in sub-par documentation being submitted to building officials, thus requiring more time to review documents and determine compliance. The CI subprogram will work with the California Association of Building Energy Consultants (CABEC), CEC and CALBO to increase the stringency of the Title 24 Certified Energy Analyst test, initiate a certification process for Title 24 consultants, and begin requiring

energy education for building officials as part of CALBO's existing continuing education requirements.

The CI subprogram will also work with the CSLB (California State License Board) and the DCA (California Department of Consumer Affairs) to conduct outreach to members regarding the importance of the standards to the state and to their customers, and to encourage the CSLB to enforce the HVAC permitting requirements with their members.

Activity 2-1 d): Evaluate proposed changes to the code and compliance approaches to simplify and expedite compliance.

Feedback from building officials indicates that they are overwhelmed by the volume, complexity, and rapid changes to the energy codes. As a complement to the role-based training, the CI subprogram will work with industry experts, CEC, and building officials to develop and test role-based and context-sensitive code guidelines. The guidelines will target specific compliance items and common measures that must be addressed at each stage in the permitting and inspection processes.

The CI subprogram will conduct research to identify specific areas of the code that can be simplified by reducing the number of trade-offs and compliance options and/or transitioning to a greater number of mandatory measures.

In addition, the CI subprogram will work to increase the availability of online permitting resources and the consistency of requirements and documentation across all jurisdictions, with an initial focus on geographically contiguous regions. Online permitting makes obtaining permits more convenient and less costly, and geographic consistency provides a more stable and easier-to-understand process for building designers and contractors, as well as building officials.

Activity 2-1 e): Work with local governments to improve code compliance, adopt above code ordinances, and provide training/education.

The primary goal of the compliance improvement subprogram elements is to improve code compliance. As discussed in activities a) through d) above, CI subprogram will be dramatically expanding and enhancing efforts in support of this goal, launching several different outreach and training offerings and activities.

The C&S RC subprogram has adopted a demand-side philosophy to local code adoption, consistent with the general philosophy of energy efficiency. California has a very robust energy efficiency code that can, if fully enforced, result in a tremendous amount of savings and reduction in both energy usage and peak demand. The RC subprogram will conduct outreach to local governments and green communities through Government Partnerships Programs, Build It Green, and others industry partners to educate interested participants about the potential savings that could be realized through optimizing compliance with existing codes prior to adopting a new code. The RC subprogram will inform local governments that optimizing compliance with existing codes is one of the

most immediate and significant steps a city or county can take toward reducing the jurisdiction's carbon footprint, and will request a commitment from each participant to take documentable steps toward that end.

Many local governments, in their eagerness to take action in the absence of federal leadership, have individually developed and adopted unique local codes to reduce the climate change impacts of the building activities in their jurisdictions. Unfortunately, codes are developed and adopted without any real overall coordination with other jurisdictions, resulting in a plethora of local ordinances and code requirements throughout the state that are changing frequently, making it impossible to easily track what code applies in which jurisdiction at any given time. The RC subprogram will encourage local governments to work with neighboring jurisdictions to adopt consistent requirements and to remain consistent with current Title 24 climate designations to reduce potential market confusion.

One of the RC subprogram goals for local codes is to promote consistency with the current Title 24 climate zone structure, with which market actors are used to working. The RC subprogram will work with local government partners to identify and document their objectives for a local code and also with the CEC and Building Standards Commission (BSC) to make the next generation of the State's Green Building Standards meet those objectives for most, if not all local governments. First, the RC subprogram will work with local governments to support development of a package of cost-effective local energy codes that exceed Title 24 minimum requirements for residential and nonresidential new construction. The RC subprogram will support efforts to obtain CEC pre-approval to simplify the approval and adoption process at the local level. In addition, to begin harnessing the tremendous savings potential from existing homes, the RC subprogram will support development of a package of standards that are applicable at time-of-sale or major remodels. Local ordinances will serve as an opportunity to test the efficacy of the codes and inform regulators as to the readiness of the codes for statewide adoption.

Activity 2-1 f): Conduct outreach and education efforts to improve compliance with Title 20 Appliance Standards.

The IOUs' experience working with industry actors on Title 20 advocacy indicates that there are two primary paths for equipment covered by Title 20 to move through the supply chain from manufacturers to consumers. The first is via manufacturers, distributors and contractors, while the second is via retailers directly to consumers. Similar to the Title 24 outreach, the IOUs plan to target each actor in the supply chain for selected measures with significant savings potential and for which compliance rates are relatively low.

Given the wide range of industries and the organization of their distribution channels, compliance improvement activities for appliances will be conducted on an industry-specific basis. For example, compliance improvement outreach for manufacturer-dominated industries logically begins with manufacturers since top down efforts will

affect most product sales in California. If major manufacturers are located overseas, as is the case of consumer electronics for example, we fully expect the need to travel to other countries to conduct effective outreach and training.

Different approaches will be used to educate and train retailer-dominated and contractor-dominated industries. In the retailer-dominated case, for example, compliance efforts must target the stocking practices of these retailers. In the contractor dominated case, where contractors are largely responsible for the purchase and installation of the product, compliance efforts must focus on outreach to contractors.

The C&S program will coordinate with the CEC to conduct outreach to equipment manufacturers to inform them of existing code requirements, and to facilitate their compliance from both a technical and administrative perspective. Assistance will be provided to manufacturers to support their efforts to ensure equipment sold in California meets the minimum technical requirements, and to successfully complete the certification process with the CEC.

For measures such as pool pumps, where most are sold through distributors and installed by contractors, in addition to working with the pump manufacturers, the program will work directly with distributors to educate their representatives. The IOUs will also conduct outreach to contractors directly, and will work with trade organizations to leverage their existing communications networks. Outreach activities may include attending trade conferences and regional meetings, authoring articles for industry newsletters or publications, or direct contact via email or printed materials.

Other measures, such as incandescent lamps and consumer electronics are often purchased directly by consumers through retail establishments. Though the market actors are different for these measures, the C&S program will use similar methods to reach as many market actors as possible. Trade associations are expected to be important stakeholders in this effort and will be leveraged as much as feasible. The IOUs will coordinate with regulators and other providers to identify gaps and opportunities to collaborate.

## 7. List of Measures & CASE Studies

Following are tables of possible IOU CASE study topics. For a number of reasons, these lists are not static. After further planning, IOUs may decide to swap leads, co-fund, or make other changes, as appropriate. During the CASE study development process, it is sometimes found that there is insufficient market data or economic information to justify a standard. During rulemakings, industry representatives may inject sufficient uncertainty to derail a proposal. The CEC may indicate that they are more interested in some proposals and delay others. Sometimes new ideas occur that were overlooked during the planning process.

The CASE study projects develop feasibility and cost-effectiveness evaluation for a variety of code improvement opportunities. These CASE projects are not a purely technical exercise,

advocacy is an important part of moving an idea into energy codes and this requires a significant amount of consensus building and negotiation.

Table 6 includes a preliminary list of measures from the CEC to be evaluated for the 2016 Title 24 Building Efficiency Standards cycle. These will inform IOU planning.

**Table 6: 2016 Title 24 Building Codes - Preliminary Measures**

| 2016 Title 24 Preliminary Measures | |
|---|---|
| **Preliminary Nonresidential Measures** | |
| Measure | Description |
| Flicker specification for all dimming systems | Flicker is a function of the lighting source (ballast, driver) and the dimming control |
| Task/ambient lighting for offices | |
| Low W/sf HVAC systems | Prescriptive performance-based requirement, cap on total installed watts. |
| Optimized Window Area, Update Window VT's | Reduce WWR from 40% to 30% while maintaining visual comfort. Estimate that 0.11/WWR reduced VT reduced daylighting savings by 25%. See ASHRAE ECB reduced WWR by building type. |
| Nat ventilation, dedicated O/A, + chilled beam or radiant system | Drive down fan energy. Window sensors interlocked with fan system |
| Dual path approach PV vs High Eff HVAC | Base case has 1W/sf of roof area, alternate has high eff HVAC |
| Eliminate reheat | Through zoning of systems or designs such as dual duct design, reheat can be mostly eliminated. |
| Daylighting control dimming plus off. | Ballasts can use 20% of power when fully dimmed. In primary zone no light can be needed much of the day. Added savings. |
| Opaque envelope U-factors | ASHRAE roof values are significantly lower |
| Retail lighting including occupancy controls | Fix general lighting in tailored method. Further LPD reductions, trade-offs with occupancy sensing controls |
| Skylighting in lower ceiling heights | Skylighting required in spaces > 15 ft, related to cost of lighting well and spacing of skylights. Technologies to reduce cost of light wells and to spread light so skylights can be further apart. |
| Egress lighting | Turn all the way off when space is unoccupied. Effort involves working with state fire marshal and perhaps NFPA. |
| Economizers | Catch up to IECC - required down to 33 kBtu/h, FDD updates |
| Façade and landscape lighting | ASHRAE has lower LPDs |
| Parking lot lighting (tall pole motion sensing?) | Motion controlled bi-level expanded to above 24 ft if technology ready. Consider expanding to other applications. |
| Solar pool heating for hotel/motels | Scoped out as cost-effective application of solar pool heating (year round operation) |
| Lab fume hoods, Occupancy sensing control of sash | Sash can be closed when no one is in front of fume hood. Saves energy and increases IAQ |
| Streamline and remove exceptions | Simplify and expand scope when possible |

| | |
|---|---|
| Plug-in hybrid and EV charging circuit | Reduces transportation costs and emissions, coincident with PV output |
| Plug for trucks at refrigerated warehouses | |
| **Nonresidential ACM** | |
| Refrigeration model in ACM | Allow trade-offs |
| Whole building (BEARS) model including deemed plug loads. | Software also generates BEARS rating and ZNE rating |
| Improved Natural Ventilation simulation | |
| PV model offsets consumption | Also useful; for ZNE rating |
| Radiant model including comfort | Provides accurate estimate of benefit of radiant cooling methods |
| Improved VRF simulation | Current model may be inaccurate. May require added manufacturer data for credit |
| Base case WWR by building type | ASHRAE 90.1 has reduced WWR for dome building types (i.e. 22% for schools, 11% for retail, 7% for grocery store, 19% for small office etc.) |
| Solar absorption air conditioning | |
| Combined heat and power | |
| **Process Loads** | |
| Evap fan speed control for walk-ins | Saves fan energy and compressor energy |
| Pipe sizing for compressed air systems | Pressure drop losses reduced |
| Specific efficiency requirements for refrigeration equipment | |
| Air dryer efficiency for compressed air | Modulating systems versus on/off systems |
| Capacity controls for centrifugal compressors | Remove exception from compressed air system requirements |
| **Preliminary Residential Measures** | |
| Low-rise multi-family prescriptive package | |
| QII - Quality Insulation Installation inspection | |
| All high efficacy lighting | Show availability of high quality high efficacy products for all sockets. Trade-off with PV |
| Ducts in conditioned space or ductless HVAC | Variety of methods, cathedral ceilings, scissor truss, mini-splits etc. |
| Tested Infiltration < 3 ACH 50 | Catch up with IECC, have to show IAQ is OK, may be done in conjunction with mandatory CALGreen to reduce source pollutants |
| Compact water distribution | Measured length of pipe between water heater and fixture |
| Controlled supply mech ventilation | Better air quality, cleaner house |
| Dual path PV with high efficiency HVAC and DHW | |
| Coastal compressorless comfort | White paper for 2013 standards |
| Walls - R-21 + R5 in all CZs | Also consider R-15+ R-8 exterior insulation |
| Windows 16% of floor area | Highly controversial, should be based on survey |
| Heat recovery ventilator | Heat recovery in very hot or very cold climates |

| | |
|---|---|
| Simplify and remove exceptions | |
| Plug-in hybrid and EV charging circuit (MF) | |
| High efficiency white goods | Credit in model perhaps prescriptive trade-off |
| **Residential ACM** | |
| Multi-family modeling | |
| Evaporative cooling modeling | |
| Ductless AC system modeling | |
| Sealed attic modeling | |
| Whole building (HERS) model including deemed plug loads. | Basis of HERS rating and ZNE |
| PV model offsets consumption | Supports ZNE goal |
| Locational efficiency credit when solar access is low | Prepare for ZNE or equivalent |

Table 7 includes a preliminary list of Title 20 measures under consideration by the CEC for the 2012-2015 Title 2- cycle. These will inform IOU advocacy work .

**Table 7: Title 20 Appliance Standards – Preliminary Measures.**

| Title 20 Measure | Description (all subject to change) |
|---|---|
| ***Lighting*** | |
| Dimming ballasts | Minimum efficiency standards for dimming ballasts, and possible limits on standby wattage. Standard would likely use the Relative System Efficacy (RSE) or the Ballast Luminous Efficiency (BLE) metric, with minimum performance requirements at full light output only or at several light levels. |
| Multifaceted-Reflector lamps | Minimum efficiency standards for multifaceted-reflector lamps, possibly with tiered standards. May also require minimum light quality/lamp performance standards. |
| LED lamps | Require LED lamps to meet minimum performance requirements (e.g. dimming and lamp life), minimum light quality standards (e.g. CRI), and modest efficiency (lpw) requirements. |
| EISA exempt lamps | Apply existing T20 general purpose light bulb standards to EISA exempt bulb types, including: 3-way, 2,601 – 3,000 lumen, shatter-resistant. candelabra base, intermediate base. All can accommodate halogen capsules for reduced power. Consider coverage at similar stringency as non-exempt bulbs (approx. 30% lower power) |
| Lighting Accessories | Maximum energy use and standby power for nightlights (NL), maximum power/bulb requirements for decorative string lights (DSL), and maximum power requirements for illuminated house numbers (IHN). |
| Outdoor Lighting | Sets minimum performance requirements for pole-mounted outdoor lighting, including street, highway, parking, and area fixtures with "controls-ready" requirements in some cases. |
| Linear fluorescent fixtures | Propose test and list requirement for Energy Effectiveness Factor (EFF) and listing on product documentation resulting Target Efficacy Rating (TER) values from a combination of lamp lumens and ballast factors. |
| Illuminated street number signs | Set an efficacy standard (active power limit) to effectively require LEDs. Recommend requiring that all illuminated address numbers utilize photo-switches. Finally, recommend a standby power limit of 0.75 W. |
| Plug-in luminous signs | Set a standard establishing maximum power per square foot of illuminated area, and additional control requirements (required integral on/off switch, supplemental control for signs with face area(s) greater than 4 sqft). |

| | |
|---|---|
| Computers | Propose maximum energy requirements and power management enablement upon shipment for desktops and laptops; minimum power supply unit efficiencies for desktops. Exploring energy use limits or power limits in different operating modes. |
| Servers | Propose minimum power supply unit efficiencies and power proportionality for servers. |
| Game consoles | Set standard to require an auto power down feature and establish a maximum allowable standby power level. |
| Computer/video displays | Set maximum On Mode and Sleep Mode power consumption levels, as a function of screen size. Consider luminance and automatic brightness control requirements. |
| Set top boxes (terrestrial, cable and satellite) | Propose an energy use limit for new STBs. May include prescriptive requirements such as auto-off feature and performance-based maximum power demand per defined feature set (e.g., per tuner). Develop test and list requirements for small networking equipment. |
| Imaging Equipment | Propose maximum total energy consumption (TEC) levels for imaging equipment, which includes copiers, fax machines, printers, scanners, and all-in-one devices. |
| Low power modes | May propose required low-power modes, with maximum power levels, for various equipment. Low power modes include sleep, standby, idle, off. |
| Power Factor Interactive Effects | Appliance energy efficiency performance is influenced by power factor, such that losses in distribution circuits can be reduced by improving poor power factor. This is currently being studied in PIER research. This proposal would bring PIER findings into code as a consistent policy for appliances where merited |
| ***Water and Miscellaneous*** | |
| Toilets and Urinals | This standard proposal revises the current standards in Title 20 regulations to conform to the legislatively enacted performance standards of AB715, by having toilets have 1.28 gallons per flush and urinals have 0.5 gallons per flush effective January 1, 2014. |
| Air Filter Labeling | Require a label for air filters (a consumer version of the existing AHRI 680 label) so that consumers and designers can select the appropriate filter for the system. |
| Pool and Spa Equipment | Update current regulations to better align with APSP 15. Add performance efficiency requirements for new and replacement motors and pool heater hydraulic performance. Require labeling of efficiency performance and compliance information on portable electric spas to better inform consumers. |
| Faucets | This standard proposal sets the maximum flow rate for lavatory faucets and lavatory replacement aerators at 1.5 gpm at 60 psi, effective January 1, 2014. It also expands the definition of lavatory replacement aerator to include all flow restricting accessories, to encourage design best practices. |
| Water Meters | Propose requiring testing for accuracy of residential water meters at levels indicative of household leaks, to better identify and prevent leaks. |
| Landscape Irrigation Equipment | Set performance standards and labeling requirements for landscape irrigation controls and sensors; require a rain shut-off device and a test and list for landscape irrigation controllers (and add-on devices) for standby mode power. |
| Commercial Clothes Dryer | Commercial gas dryers are regulated by neither federal nor California regulations; there exists the opportunity to establish new Title 20 standards for commercial gas dryers to be sold in California. The C&S program will develop the testing procedure for Energy Factor of commercial clothes dryers, and establish a minimum performance requirement. |
| Refrigeration Condensing Units | Develop test procedure for EER for fixed output refrigeration condensing units and part load EER for variable output refrigeration condensing units. Establish a minimum performance requirement. Require either floating head control; require systems operate at 70°F or lower min. condensing temp. |

Table 8 shows a preliminary list of federal appliance standards rulemaking events. IOUs will respond to rulemaking events carried out by USDOE, and possibly others, that impact California.

**Table 8: Federal Appliance Standards**

| Product Category | DOE Proceeding Event Description | Anticipated Date |
|---|---|---|
| 3-Phase CAC | Standard Preliminary Technical Support Analysis<br>Standard Notice of Proposed Rulemaking | Dec-13<br>Dec-14 |
| ASHRAE Products | Standard Final Rule | Nov-13 |
| CACs, HPs (air-cooled) | Standard Final Rule | Jul-13 |
| Ceiling Fans | Standard Final Rule | Jul-13 |
| CFL (Medium Base) | Test Procedure Final Rule | Jun-13 |
| Commercial Boilers | Standard Framework | Jul-14 |
| Commercial Clothes Washers | Standard Preliminary Technical Support Analysis<br>Standard Notice of Proposed Rulemaking | Jul-13<br>Jul-14 |
| Commercial Ice Makers | Standard Final Rule | Jul-13 |
| Commercial Refrigeration | Standard Final Rule<br>Test Procedure Final Rule | Jan-13<br>Jan-13 |
| Commercial Unit Heaters | Standard Final Rule | Jul-13 |
| Dehumidifiers | Standard Preliminary Technical Support Analysis<br>Standard Notice of Proposed Rulemaking | Dec-13<br>Dec-14 |
| Dehumidifier (Active Mode) | Test Procedure Notice of Proposed Rulemaking<br>Test Procedure Final Rule | Jan-13<br>Jul-13 |
| Direct Heating Equipment | Test Procedure Final Rule | Sep-13 |
| Dishwashers | Standard Preliminary Technical Support Analysis<br>Standard Notice of Proposed Rulemaking | Jul-13<br>Jul-14 |
| Exit Signs | Test Procedure Final Rule<br>Standard Final Rule | Jun-13<br>Jul-13 |
| Furnace Fans | Test Procedure Final Rule<br>Standard Notice of Proposed Rulemaking<br>Standard Final Rule | Apr-13<br>Dec-13<br>Dec-13 |
| General Service Lamps | Standard Framework | Jan-14 |
| GSFLs | Standard Notice of Proposed Rulemaking<br>Standard Final Rule | Aug-13<br>Apr-14 |
| HIDs | Standard Final Rule | Jan-13 |
| IRLs | Standard Notice of Proposed Rulemaking<br>Standard Final Rule | Aug-13<br>Apr-14 |
| Microwaves (Active) | Standard Framework<br>Standard Preliminary Technical Support Analysis | Jan-13<br>Jul-14 |
| Pool Heaters | Test Procedure Final Rule | Sep-13 |
| Pre-rinse spray valves | Standard Final Rule | Jul-13 |
| PTACs, PTHPs | Standard Framework | Sep-13 |
| Ranges, Ovens | Standard Framework | Mar-14 |
| Residential Boilers | Standard Preliminary Technical Support Analysis<br>Standard Notice of Proposed Rulemaking | Dec-13<br>Dec-14 |
| STBs | Test Procedure Final Rule<br>Standard Final Rule | May-13<br>Jun-13 |

| | | |
|---|---|---|
| Televisions | Standard Final Rule | Jan-13 |
| Torchieres | Standard Final Rule | Jul-13 |
| Traffic Signals | Standard Final Rule | Jul-13 |
| Vending Machines | Standard Framework | Jul-14 |
| Water Heaters | Test Procedure Final Rule | Sep-13 |
| Wine Chillers | Standard Preliminary Technical Support Analysis<br>Standard Notice of Proposed Rulemaking | Aug-13<br>Aug-14 |

## 8. Coordination & Integration

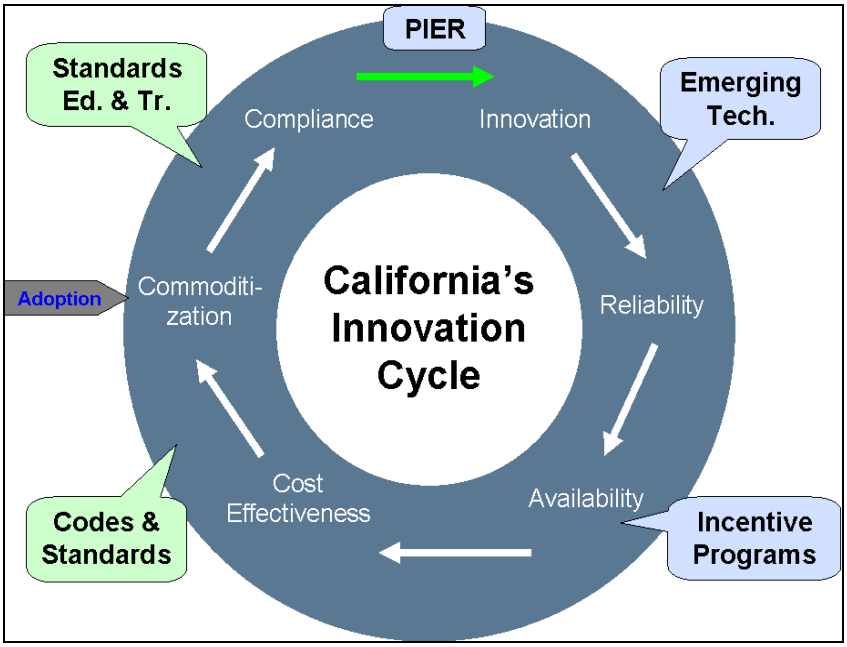
At the CPUC's direction, the C&S program is adding a non-resource Planning and Coordination Subprogram to improve the integration of portfolio program offerings. The C&S team will coordinate with both internal and external entities to establish a dynamic and integrated planning and implementation process to methodically and purposefully accelerate the movement of successful, cost-effective measures from the ET program through voluntary offerings and ultimately to adoption into standards. The three primary functions of the planning and coordination subprogram include strategic planning, internal coordination and communication, and statewide collaboration.

### a) C&S Statewide Coordination

Many requirements for C&S coordination are derived from the CPUC's objective to mitigate climate change through regulatory objectives, including Title 20 and Title 24. While the C&S program comprises the primary intervention to achieve these objectives, it must be considered within the context of California's innovation cycle:

- Adoption causes commoditization in the sense that a once high margin product becomes the industry standard.
- Commoditization spurs companies to innovate.
- Innovation creates new, differentiated, high-margin products for the competitive market.
- Voluntary programs commercialize new innovations.
- Commercialization creates code readiness leading to adoption.

**Innovation Cycle**




Since the primary purpose of the C&S program is to propose and support adoption of code enhancements, it is essential that IOUs collectively respond to all significant energy savings opportunities identified for a future code update cycle. For example, IOUs are now planning how best to coordinate efforts to address a long list of potential Title 24 code enhancements for the 2011 code cycle. In general, planning is conducted on an as needed basis.

Codes and standards operations are conducted relative to a multi-year time horizon, so statewide meetings organized on a quarterly basis are sufficiently frequent to coordinate activities. Some CASE studies are developed through co-funding agreements when multiple IOUs are interested in or have specific value-added knowledge, perhaps through previous research. More typically, however, code proposals are developed by one IOU on behalf of the statewide since each proposal is a fraction of the program budget. During these meetings, the primary objectives are to discuss CASE study objectives and develop mutual support for public proceedings.

The C&S program will enhance coordination and integration of codes and standards with other energy efficiency programs to maximize energy savings and demand reducing by coordinating training programs and utilizing the experience gained in resource programs to inform the development and advocacy of new codes. The C&S program will work with the Government Partnerships to improve code compliance, adopt above code ordinances, and provide training and education. The C&S compliance improvement subprogram will focus efforts on HVAC new installations and replacements in coordination with the HVAC program. The C&S program will also meet periodically with HVAC program staff to discuss compliance improvement strategies, training, and other program needs.

Coordination between C&S and other parts of the portfolio falls into one of two categories: existing standards and future standards. Compliance with code is essential to completing the commoditization process and capturing the benefit of commercialization efforts for the benefit of society, so the CI subprogram leads efforts to implement existing standards through development of core activities that can be delivered either through, or in coordination with, other programs. Opportunities are identified through small group meetings between C&S and each target group such as workforce education and training, local government partnerships, new construction programs. In addition, the IOUs will coordinate program efforts with the local utility integration teams and the Statewide Integration Task Force to identify successful integration approaches and offerings, potential pilot programs and metrics.

Small group meetings mentioned above, are particularly useful, as they serve to identify incentive program opportunities to leverage the pull of existing standards that have effective dates far enough in the future to accommodate program changes. For example, an appliance standard adopted with an effective date two years hence would provide an opportunity to develop an incentive program pull that complements the C&S push.

Coordination activities around future standards are, likewise, developed through individual targeted meetings. Once the C&S team has identified potential code enhancement opportunities for a future code proceeding, the team meets with Mass Market, Targeted Market, Emerging Technologies, HVAC, demand response, or general education and training leads to discuss gaps between adoption needs and current code readiness. As appropriate, new measures may be added to incentive programs, new projects may be added to the ET portfolio. Sometimes, when ongoing CEC proceedings coincide with incentive program planning, incentive offerings can be integrated with code enhancement proposals to increase influence on proceedings.

Coordination with external organizations falls into a few broad categories. A particular code proposal typically attracts directly affected industry stakeholders. If an industry employs associations organized to oppose energy efficiency standards – which is usually the case – IOUs will seek support from other advocates and share information that enables their advocacy, as well as ours. Sometimes IOUs are able to work directly with industries that are not, in principal, opposed to all regulations.

b) **C&S Coordination with External Organizations & Entities**

As Federal preemption continues to grow, and as DOE continues to increase federal proceedings activities, it is necessary for California IOUs to increasingly engage with national organizations such as ACEEE, ASAP, and the NNRDC. In particular, since the innovation engine, as pictured above, turns over once every three years in California and once every eight to ten years at DOE, the C&S program needs to work with national organizations to relax federal preemption policies to better help California meet AB 32 energy efficiency targets. California IOUs have ramped up operations to contribute materially DOE proceedings through analysis, letters, and negotiations.

At a statewide and local level, the C&S program will develop training and compliance improvement activities with entities that include, but are not limited to, California Building Industry Association, local chapters of the Building Industry Association, Build it Green, Institute of Heating and Air Conditioning Industries, International Brotherhood of Electrical Workers, National Electrical Contractors Association, California League of Cities. Additionally, outreach and communications for Title 20 will include industry associations such National Electric Manufacturers Association, American Lighting Association, California Retailers Association, and the International Pool and Spa Association.

**How the Codes & Standards Program will Coordinate with Other Energy Efficiency Programs**

| Program With Which C&S Will Coordinate | Coordination with Advocacy Subprograms | Coordination with CI or RC Subprograms |
|---|---|---|
| HVAC | ➢ Research possible scenarios to help improve HVAC quality construction<br>➢ Develop a whole building comfort metric that is the basis of compressorless homes in the coastal climate zones<br>➢ Review mandates to increase the use of FDD and improvements to FDD technologies | ➢ Research the HVAC permitting tools available on the market, select permitting tools to test during the local government process pilot, and determine which best practices and tools to incorporate into the building official and HVAC contractor role-based training curriculum the program will develop.<br>➢ CI will work with the CEC, CALBO and the CSLB to identify possible penalties that may be applied to contractors who do not pull required permits or operate without the appropriate licenses. The program will investigate potential penalties during the local government process pilots and incorporate those penalties that prove effective during the pilot into the role-based training curriculum that the program will develop and roll out to additional jurisdictions.<br>➢ CI subprogram personnel will work with HVAC Quality Installation and Workforce Education and Training program staff, utility education centers, and regulatory agencies to develop a brand, incentive mechanism, and consumer campaign, and technician training and certification programs. CE will evaluate the recently completed ACCA (Air Conditioning Contractors |

| Program With Which C&S Will Coordinate | Coordination with Advocacy Subprograms | Coordination with CI or RC Subprograms |
|---|---|---|
| | | of America) Quality Installation Specification that has been adopted by the EPA ENERGY STAR Program to determine how to incorporate this into role- and measure-based training to be provided by the IOUs.<br>➢ Investigate the feasibility of an HVAC serial number tracking process to increase compliance. Various HVAC industry groups and HVAC distributors have expressed an interest in pursuing this as a way to increase the quality of installations and better ensure Title 24 compliance. |
| Government Partnerships | | ➢ CI subprogram personnel will conduct a holistic process pilot in select building departments in addition to developing and delivering role-based tools and training to building department personnel.<br>➢ RC subprogram personnel will encourage local governments to lead by example, and to adopt codes for government buildings that match or exceed the requirements for the private sector within their jurisdiction. Those local governments that do not wish to adopt reach codes for the private sector will be encouraged to at least adopt more stringent codes for their own buildings.<br>➢ Initial C&S efforts will focus on encouraging and supporting local governments, designers, and builders/contractors to implement and enforce existing acceptance testing requirements. CI will work with the CEC, CA Commissioning Collaborative, and industry organizations such as SMACNA to conduct outreach and provide acceptance testing education at all levels of the supply chain. |
| Workforce Education and Training | | ➢ CI will work with Workforce Education and Training program managers, CABEC, Sonoma State University, CalPoly San Luis Obispo |

| Program With Which C&S Will Coordinate | Coordination with Advocacy Subprograms | Coordination with CI or RC Subprograms |
|---|---|---|
| | | and others throughout the state to develop a curriculum that can be implemented at the state and community college level to expand current energy-related offerings and train building energy analysts in the theory and concepts of energy-efficient building design, simulation and construction.<br>➢ CI is working with IBEW, NECA, California Community Colleges, and others to develop and implement an electrical contractor's training program for advanced lighting controls. This is a critical step in facilitating the installation of the sophisticated lighting controls that are essential to meeting the AB1109 Huffman Bill and zero net energy goals. |
| Targeted Markets/Mass Market/Emerging Technologies | ➢ Through small group meetings, C&S will work with the Mass Market, Targeted Market and Emerging Technologies programs to identify incentive program opportunities to leverage the pull of existing standards that have effective dates far enough in the future to accommodate program changes. For example, an appliance standard adopted with an effective date two years hence would provide an opportunity to develop an incentive program pull that complements the C&S push. For promising measures that are evaluated by the ETP, the C&S program may propose that they are included in reach codes in parallel with EE incentive programs.<br>➢ C&S will work with the targeted and mass market program managers to require program participants to complete and submit the | ➢ CI will work with fellow energy efficiency program managers to identify and fulfill code-related training needs in order to keep program managers up to date on current and future codes, and to help prepare IOU sales reps with the knowledge they need to effectively market incentive programs. |

| Program With Which C&S Will Coordinate | Coordination with Advocacy Subprograms | Coordination with CI or RC Subprograms |
|---|---|---|
| | applicable acceptance tests required by Title 24 to receive an incentive for HVAC and lighting controls equipment. This will increase compliance with the acceptance tests and help assure the incented equipment is installed according to code intent. | |

## 9. Marketing & Outreach/Education & Training

Outreach for advocacy activities occurs through telephone calls and e-mails to industry stakeholders throughout the CASE study development process, leading up to commencement of a CEC rulemaking. After commencement of CEC rulemaking proceedings, CASE studies are presented during public workshops and hearings conducted by the CEC that are typically attended by building or appliance industry representatives, environmental groups, compliance industry representatives including local government officials, advocates from other states. In response to industry issues and concerns, the IOUs and their consultants will contact specific representatives or conduct stakeholder meetings to address specific issues more broadly. Following adoption hearings, the IOUs participate in developing compliance manuals.

Compliance improvement encompasses numerous industries engaged in supplying buildings and appliances to California; hence, outreach and marketing activities will be conducted through a variety of channels. IOU's training centers will conduct direct outreach to industry associations such as the Contractor State Licensing Board, California Building Officials Association, California Association of Building Energy Consultants, Consumer Electronics Association, and National Electrical Manufacturers Association. E-mail solicitations and paper calendars are sent to individuals notifying them of upcoming classes. Local governments will also be contacted through local government partnerships and circuit riders assigned to provide consulting services.

## 10. Quality Assurance & Evaluation Activities

To help ensure quality assurance and effective evaluation, the IOUs will continue their ongoing efforts to track and assess the effectiveness of the C&S Program in advocating for new codes, and for increasing compliance with existing codes.

The C&S program will continue to support the impact evaluation efforts of the CPUC and its contractors by documenting code advocacy efforts, and documenting compliance improvement efforts and education and training efforts and their effects on participant behavior. The IOUs will coordinate with the CPUC and their impact evaluation contractors

to ensure that the sufficient type and level of data are being collected at the appropriate level of detail to enable an estimation of energy savings related to codes and standards activities. This includes supporting the CPUC in their research effort to establish Title 20 and Title 24 baselines, and track changes in adoption and compliance over time. This includes providing appropriate program data, as well as encouraging the participation of vendors, contractors, building officials and others, as appropriate, in providing information for establishing baselines and changes in penetration over time.

For the purpose of quality assurance in carrying out and improving the C&S program, the IOUs will be conducting various qualitative evaluation activities to establish IOU effectiveness in various market transformation activities. These include but are not limited to:

- Code adoption - Research with participants in the code adoption process to assess the level and quality of participation by the IOUs and other stakeholders. This includes interview-based research, as well as review of documentation of participation.
- Compliance Improvement – Effectiveness of various education and training activities, based on pre- and post- participation assessment of 'knowledge swing' of participants, and commitments to action made by participants and participant organization that stem from compliance improvement activity. Initial assessments will be succeeded by assessments in the post period to identify changes in code-related activity resulting from the CI subprogram.
- Reach Code Assistance – Effectiveness of IOU efforts to assist local governments in establishing, implementing and enhancing compliance with reach codes. Initial assessments of energy codes and code compliance, local code support capability and other factors will be followed by an ongoing assessment of the effects of IOU reach code assistance.

For compliance improvement, the IOUs will be using this assessment process to identify changes in awareness, capability and behavior change among individual CI participants, and participant organizations, resulting for the various compliance improvement activities. The IOUs will also look into calibrating our assessment of compliance improvement through evaluations of non-participant awareness, capability and behavior changes. For example, if there is a compliance improvement effort focused on building officials, the research could include an assessment of awareness, capability and behavior of building officials who did not participate in the training.

Additional, formative research will be conducted to provide insight into emerging issues related to current and pending codes and standards. Specifically, research will be carried out to identify issues and trends appearing along the delivery chain for appliances as well as for building practices.

11. Program Theory & Logic Model and Performance Indicators

On December 2, 2010, the Commission issued Resolution E-4385, approving Program Performance Metrics (PPMs) for Pacific Gas and Electric Company, Southern California Edison Company, Southern California Gas Company and San Diego Gas and Electric Company for 2013-2014 statewide energy efficiency programs and subprograms. In addition, this Resolution approved updated logic models for the statewide programs. Below are the approved logic models for the C&S program.

a) Building Codes
b) California Appliance Standards
c) Federal Appliance Standards
d) Compliance Improvement
e) Reach Codes
f) Planning and Coordination

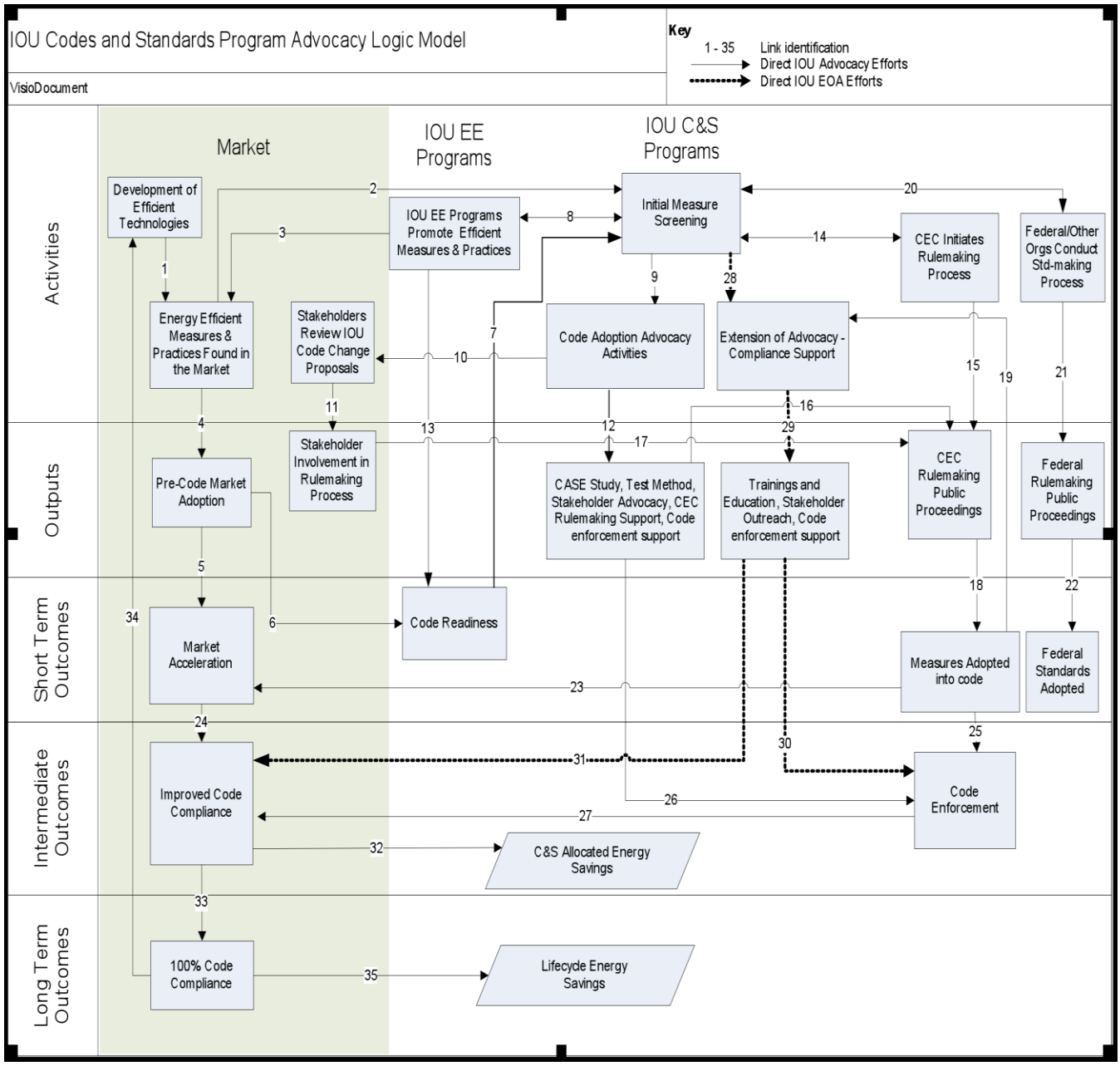
Logic models will be improved based on experience and finalized based on application to specific industries, local governments.
Logic Models and the accompanying Program Theory and Program Indicators are tools designed to illustrate program structure and operation for the purpose of program management. This logic model is a schematic of the program as planned.

A program theory is the basis of a logic model. Effective program management applies program theory, and related performance indicators are used to determine whether program theory is correct. Indicators enable informed management responses that improve programs.

Performance indicators are intended to serve as a program's 'dashboard'; displaying information necessary for effective program operation. As with automobile dashboards; indications are neither good nor bad, but enable appropriate management responses that maintain and/or improve program performance.

Logic models, program theories, and performance indicators can provide evaluators an understanding of program activities, outputs and outcomes. However, they are not intended as the basis for estimating, valuing, or attributing program savings as they focus on program operation rather than program results. Revised logic models and program theory tables will be included in a future addendum to the PIP.

Revised logic models and program theory tables will be included in a future addendum to the program implementation plan.


IOU Codes and Standards Program Advocacy Logic Model
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Direct IOU Advocacy Efforts
Direct IOU EOA Efforts
Market
IOU EE Programs
IOU C&S Programs
Activities
Outputs
Short Term Outcomes
Intermediate Outcomes
Long Term Outcomes
Development of Efficient Technologies
IOU EE Programs Promote Efficient Measures & Practices
Initial Measure Screening
CEC Initiates Rulemaking Process
Federal/Other Orgs Conduct Std-making Process
Energy Efficient Measures & Practices Found in the Market
Stakeholders Review IOU Code Change Proposals
Code Adoption Advocacy Activities
Extension of Advocacy - Compliance Support
Pre-Code Market Adoption
Stakeholder Involvement in Rulemaking Process
CASE Study, Test Method, Stakeholder Advocacy, CEC Rulemaking Support, Code enforcement support
Trainings and Education, Stakeholder Outreach, Code enforcement support
CEC Rulemaking Public Proceedings
Federal Rulemaking Public Proceedings
Market Acceleration
Code Readiness
Measures Adopted into code
Federal Standards Adopted
Improved Code Compliance
Code Enforcement
C&S Allocated Energy Savings
100% Code Compliance
Lifecycle Energy Savings
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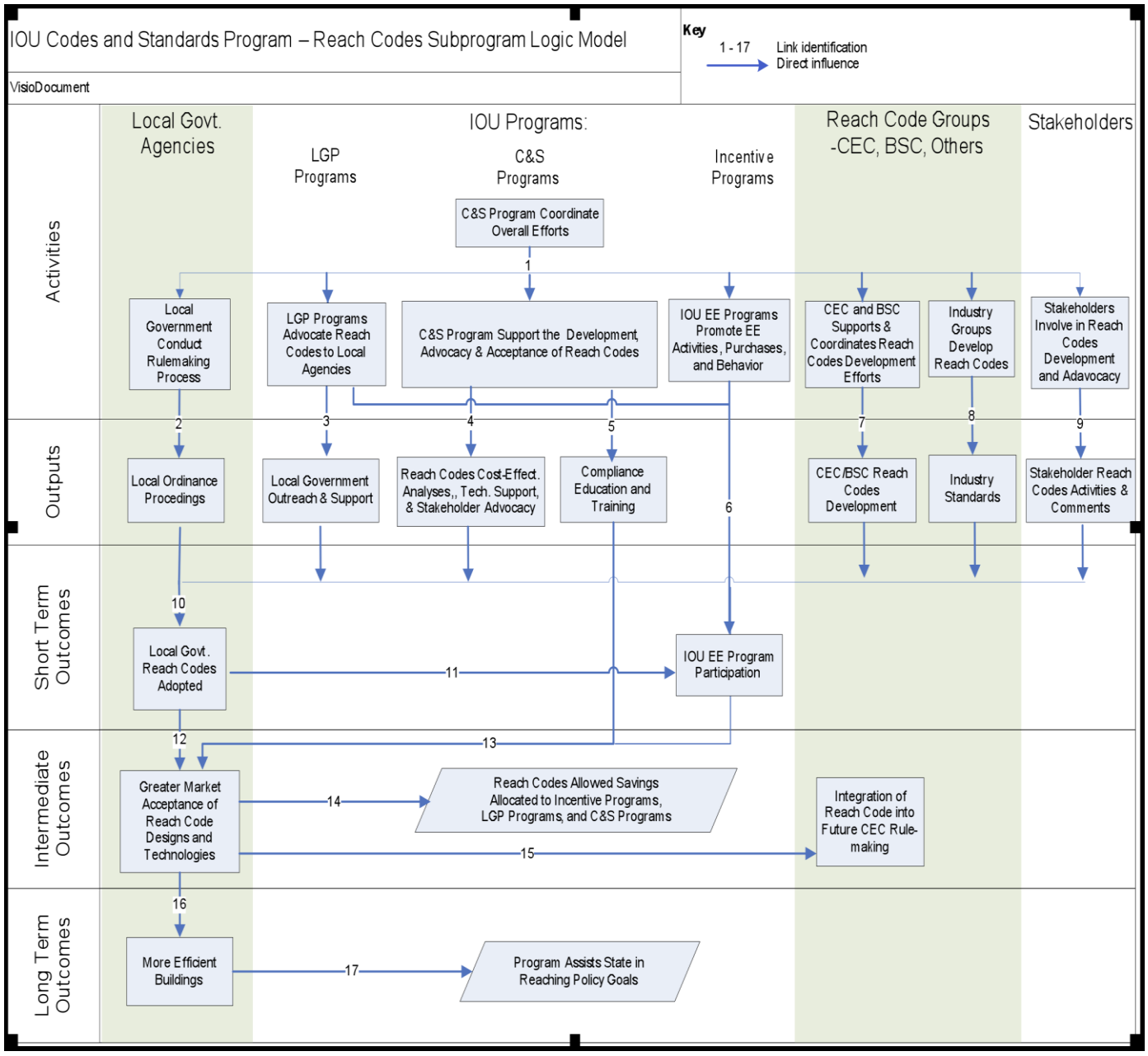
IOU Codes and Standards Program – Reach Codes Subprogram Logic Model
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Link identification
Direct influence
Activities
Outputs
Short Term Outcomes
Intermediate Outcomes
Long Term Outcomes
Local Govt. Agencies
IOU Programs:
LGP Programs
C&S Programs
Incentive Programs
Reach Code Groups -CEC, BSC, Others
Stakeholders
C&S Program Coordinate Overall Efforts
1
Local Government Conduct Rulemaking Process
LGP Programs Advocate Reach Codes to Local Agencies
C&S Program Support the Development, Advocacy & Acceptance of Reach Codes
IOU EE Programs Promote EE Activities, Purchases, and Behavior
CEC and BSC Supports & Coordinates Reach Codes Development Efforts
Industry Groups Develop Reach Codes
Stakeholders Involve in Reach Codes Development and Adavocacy
2
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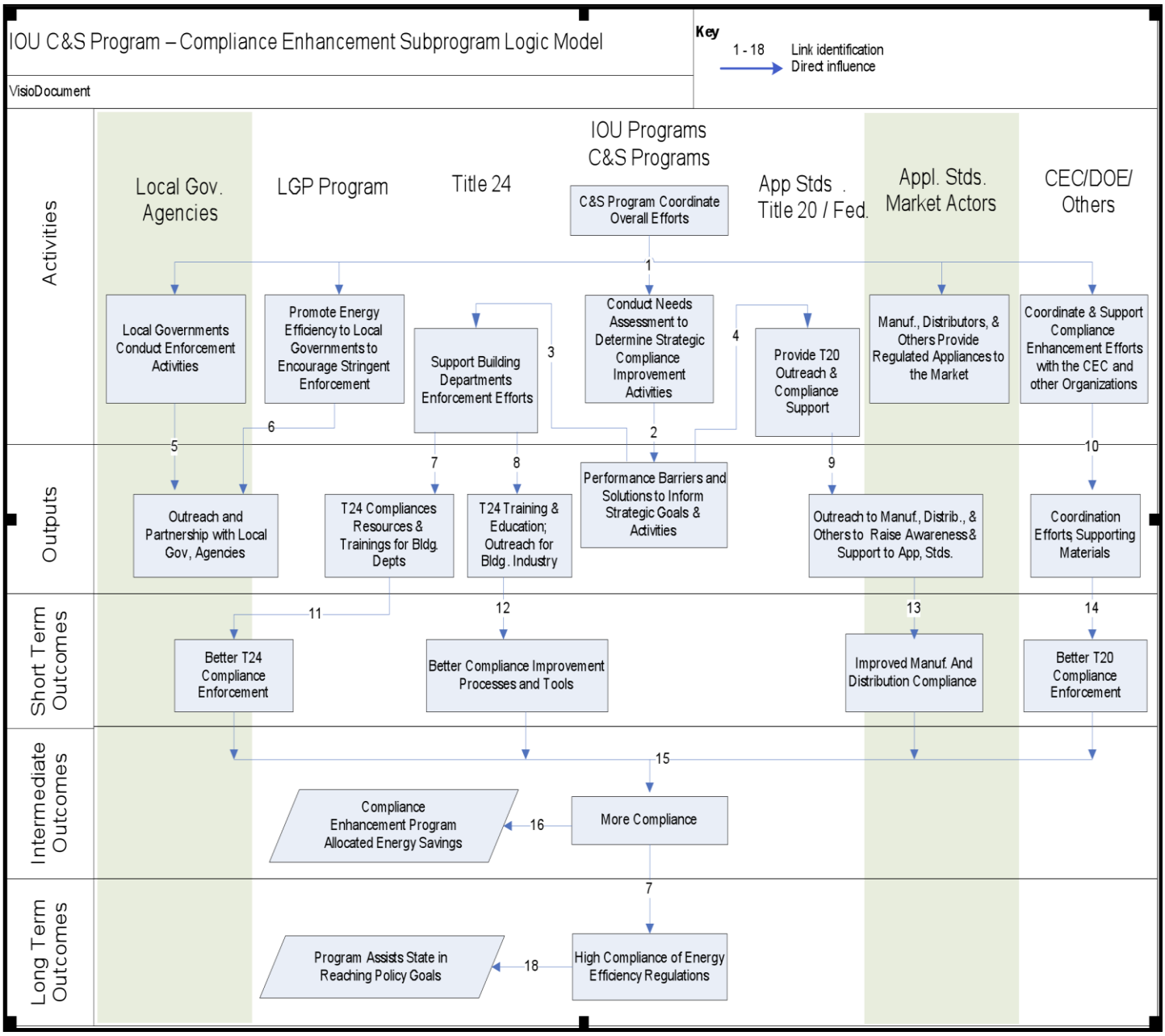
Local Ordinance Procedings
Local Government Outreach & Support
Reach Codes Cost-Effect. Analyses,, Tech. Support, & Stakeholder Advocacy
Compliance Education and Training
6
CEC/BSC Reach Codes Development
Industry Standards
Stakeholder Reach Codes Activities & Comments
10
Local Govt. Reach Codes Adopted
11
IOU EE Program Participation
12
13
Greater Market Acceptance of Reach Code Designs and Technologies
14
Reach Codes Allowed Savings Allocated to Incentive Programs, LGP Programs, and C&S Programs
15
Integration of Reach Code into Future CEC Rule-making
16
More Efficient Buildings
17
Program Assists State in Reaching Policy Goals


IOU C&S Program – Compliance Enhancement Subprogram Logic Model
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Direct influence
Activities
Outputs
Short Term Outcomes
Intermediate Outcomes
Long Term Outcomes
Local Gov. Agencies
LGP Program
Title 24
IOU Programs C&S Programs
App Stds . Title 20 / Fed.
Appl. Stds. Market Actors
CEC/DOE/ Others
C&S Program Coordinate Overall Efforts
Local Governments Conduct Enforcement Activities
Promote Energy Efficiency to Local Governments to Encourage Stringent Enforcement
Support Building Departments Enforcement Efforts
Conduct Needs Assessment to Determine Strategic Compliance Improvement Activities
Provide T20 Outreach & Compliance Support
Manuf., Distributors, & Others Provide Regulated Appliances to the Market
Coordinate & Support Compliance Enhancement Efforts with the CEC and other Organizations
Outreach and Partnership with Local Gov, Agencies
T24 Compliances Resources & Trainings for Bldg. Depts
T24 Training & Education; Outreach for Bldg. Industry
Performance Barriers and Solutions to Inform Strategic Goals & Activities
Outreach to Manuf., Distrib., & Others to Raise Awareness & Support to App, Stds.
Coordination Efforts Supporting Materials
Better T24 Compliance Enforcement
Better Compliance Improvement Processes and Tools
Improved Manuf. And Distribution Compliance
Better T20 Compliance Enforcement
Compliance Enhancement Program Allocated Energy Savings
More Compliance
Program Assists State in Reaching Policy Goals
High Compliance of Energy Efficiency Regulations
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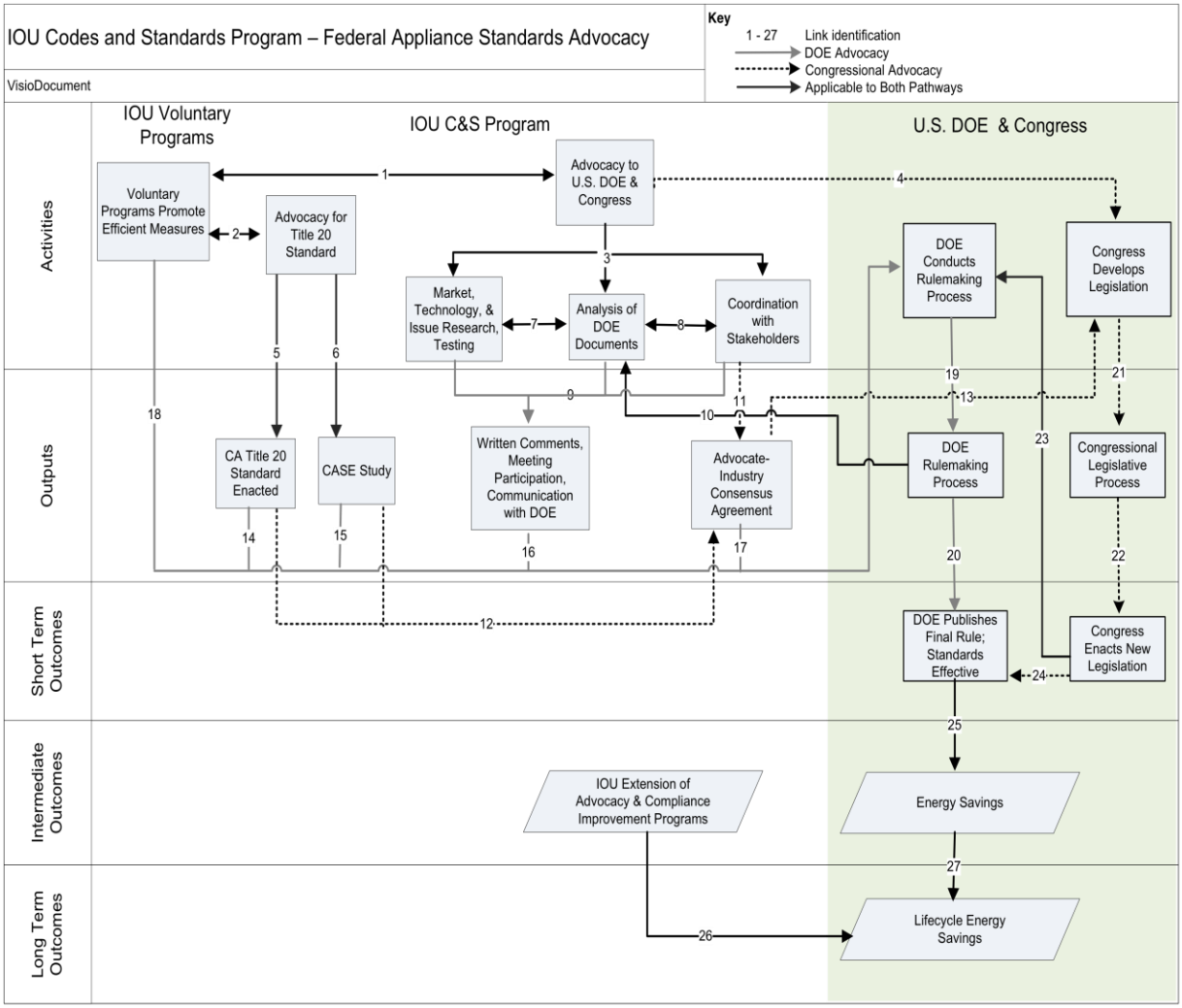
IOU Codes and Standards Program – Federal Appliance Standards Advocacy
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DOE Advocacy
Congressional Advocacy
Applicable to Both Pathways
IOU Voluntary Programs
IOU C&S Program
U.S. DOE & Congress
Activities
Outputs
Short Term Outcomes
Intermediate Outcomes
Long Term Outcomes
Voluntary Programs Promote Efficient Measures
Advocacy for Title 20 Standard
Advocacy to U.S. DOE & Congress
Market, Technology, & Issue Research, Testing
Analysis of DOE Documents
Coordination with Stakeholders
DOE Conducts Rulemaking Process
Congress Develops Legislation
CA Title 20 Standard Enacted
CASE Study
Written Comments, Meeting Participation, Communication with DOE
Advocate-Industry Consensus Agreement
DOE Rulemaking Process
Congressional Legislative Process
DOE Publishes Final Rule; Standards Effective
Congress Enacts New Legislation
IOU Extension of Advocacy & Compliance Improvement Programs
Energy Savings
Lifecycle Energy Savings
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## Appendix 1 Glossary of Acronyms

| Acronym/Term | Description |
|---|---|
| AB 32 | California Assembly Bill AB 32, California Global Warming Solutions Act of 2006 |
| ACM | Alternate Component Method,<br>The CEC's Public Domain Computer Programs, one of the CEC's Simplified Calculation Methods, or any other calculation method approved by the CEC. |
| AHRI | Air-Conditioning, Heating and Refrigeration Institute |
| ASHRAE | American Society of Heating, Refrigerating, and Air-Conditioning Engineers |
| ASHRAE 90.1 | Energy Standard for Buildings Except Low-Rise Residential Buildings |
| ASHRAE 189 | Standard for the Design of High-Performance, Green Buildings Except Low-Rise Residential Buildings |
| ASTM | American Society for Testing and Materials<br>Now referred to as ASTM International |
| BSC | California Building Standards Commission |
| C&S | Codes and Standards program |
| CA | California |
| CABEC | California Association of Building Energy Consultants |
| CALBO | California Building Officials |
| CARB | California Air Resources Board |
| CASE | Codes and Standards Enhancement |
| CEC | California Energy Commission |
| CEE | Consortium for Energy Efficiency |
| CEPs | Compliance Enhancement Programs |
| CEQA | California Environmental Quality Act |
| CHPS | Collaborative for High Performance Schools |
| CPUC | California Public Utilities Commission |
| CRRC | Cool Roof Rating Council |
| CSLB | California State License Board |
| CSU | California State University |
| DOE | United States Department of Energy |
| DCA | California Department of Consumer Affairs |
| DR | Demand Response |
| DTSC | California Department of Toxic Substance Control |
| DSA | California Division of State Architect |
| DWR | California Department of Water Resources |
| EE | Energy Efficiency |
| EISA 2007 | United States Energy Independence and Security Act of 2007 |
| EOA | Extension of Advocacy |
| EPA | United States Environmental Protection Agency |
| ET (ETP) | Emerging Technologies (Emerging Technologies Program) |
| FDD | Fault Detection and Diagnostics |
| GHG | Greenhouse Gas |
| Green Globes | Green building rating system as administered by the Green Building Initiative |

| Acronym/Term | Description |
|---|---|
| HCD | California Department of Housing and Community Development |
| HERS | Home Energy Rating System |
| HID | High Intensity Discharge |
| Huffman Bill (AB1109) | California Assembly Bill AB 1109, Lighting Efficiency and Toxics Reduction Act |
| HVAC | Heating, Ventilating and Air Conditioning |
| IBEW | International Brotherhood of Electrical Workers |
| ICC | International Code Council |
| IESNA | Illuminating Engineering Society of North America |
| IOU | California Investor Owned Utility (PG&E, SCE, SDG&E, SCG) |
| LAUSD | Los Angeles Unified School District |
| LEED | Leadership in Energy and Environmental Design<br>Green building rating system as administered by the USBGC |
| LG | Local Government |
| LGC | Local Government Commission |
| M&V | Measurement and Verification |
| NECA | National Electrical Contractors Association |
| NFRC | National Fenestration Rating Council |
| NRDC | National Resources Defense Council |
| OSHPD | California Office of Statewide Health Planning and Development |
| PG&E | Pacific Gas and Electric |
| RC | Reach Code |
| Reach Code | Codes, standards, regulations, policies and programs that exceed minimum energy codes such as Title 24, Title 20, ASHRAE Standard 90.1 |
| ResNet | Residential Energy Services Network |
| SCE | Southern California Edison |
| SCG | Southern California Gas |
| SDG&E | San Diego Gas and Electric |
| SMACNA | Sheet Metal and Air Conditioning Contractors' National Association |
| SMUD | Sacramento Municipal Utility District |
| Title 20 | Title 20, California Appliance Efficiency Regulations, Section 1601 et seq. of the California Code of Regulations. |
| Title 24 | Title 24, California Building Energy Efficiency Standards, as set forth in the California Code of Regulations, Title 24, Part 6.<br>Also known as the *California Energy Code.* |
| TDV | Time Dependent Valuation is the time varying energy caused to be used at by the building to provide space conditioning and water heating and for specified buildings lighting, accounting for the energy used at the building site and consumed in producing and in delivering energy to a site, including, but not limited to, power generation, transmission and distribution losses. |
| TOS | Time of Sale |
| UC | University of California |
| USGBC | United States Green Building Council |
| WE&T | Workforce, Education and Training |

## Appendix 2 - 2013 – 2014 Codes and Standards PIP Addendum

### *Codes and Standards Program Overview*

The Codes and Standards (C&S) Program saves energy on behalf of ratepayers by influencing continuous improvements in energy efficiency regulations, improving compliance with existing codes and standards, and working with local governments to develop ordinances that exceed statewide minimum requirements. C&S program activities extend to all buildings and potentially any appliance in California, for both advocacy and compliance improvement.

The C&S Program consists of five subprograms: Building Codes Advocacy; Appliance Standards Advocacy; Compliance Improvement; Reach Codes; and, Planning and Coordination.

1. Building Codes Advocacy Subprogram

The Building Codes Advocacy subprogram primarily targets improvements to Title 24 Building Efficiency Regulations that are periodically updated by the California Energy Commission. The subprogram also seeks changes to national building codes that impact CA building codes. Advocacy activities include, but are not limited to, development of code enhancement proposals and participation in public rulemaking processes. The program may coordinate with or intervene in ratings organizations that are referenced in Title 24; for example, the National Fenestration Rating Council, and the Cool Roof Rating Council.

2. Appliance Standards Advocacy Subprogram

The Appliance Standards Advocacy subprogram targets both state and federal standards and test methods: improvements to Title 20 Appliance Efficiency Regulations by the California Energy Commission, and improvements to Federal appliance regulations by the US Department of Energy. Advocacy activities include, but are not limited to, development of code enhancement proposals and participation in the public rulemaking process (Title 20), and comment letters based on IOU research and analysis (USDOE), and participation in direct negotiations with industry. Additionally, the program monitors state and federal legislation and intervenes, as appropriate.

3. Compliance Improvement

The Compliance Improvement subprogram is a new subprogram that combines the previous Extension of Advocacy and Compliance Enhancement subprograms. It provides education, training, and other activities targeting building departments and other industry actors responsible for compliance with Building Energy Code and Appliance Standards requirements. Activities may include development of “best practices tools” and other infrastructure elements that serve multiple compliance improvement objectives.

4. Reach Codes Subprogram

The Reach Codes subprogram provides technical support to local governments that wish to adopt ordinances that exceed statewide Title 24 minimum energy efficiency requirements for new buildings, additions, or alterations. Support for local governments includes research and analysis for establishing performance levels relative to T-24 and cost effectiveness per Climate Zone, drafting of model ordinance templates for regional consistency, and assistance for completing and expediting the application process required for approval by the CEC. The subprogram also supports local governments that seek to establish residential or commercial energy conservation ordinances for existing buildings.

5. Planning and Coordination

The Planning and Coordination Subprogram provides a formal process that aligns planning activities across the IOU energy efficiency portfolio within the Codes and Standards program activities. This subprogram supports efforts to prepare the market for future code adoption (i.e., improve code readiness), to ensure higher code compliance rates and advance the CPUC Strategic Plan goals for achieving Zero Net Energy.

***Codes and Standards 2013-2104 Activities by Sub-Programs***

**Building Energy Codes Advocacy**

The Building Codes Advocacy program will continue conducting many of the same activities as were conducted in the 2010 – 2012 program cycle, but will focus on the upcoming 2016 Title 24 Energy Building Code cycle. In addition, the Building Codes Advocacy sub-program will expand activities at the national level. Primary activities for 2013-2014 include the following:

2013 Title 24 Energy Building Code

- Support implementation of adopted 2013 Energy Building Code:
    - Complete revisions to compliance manuals and forms

2016 Title 24 Energy Building Code

- Prepare CASE studies in coordination with CEC:
    - Conduct research for 2016 building code advocacy to advance State policy goals
    - Support activities to address Department of Finance review requirements
    - Research residential ventilation / IAQ requirements to reduce and control infiltration while maintaining and improving indoor air quality
    - Research and advocate methods to remove code barriers to the increased use of renewable energy in support of ZNE goals
    - Support development of 2016 compliance software

**Appliance Standards Advocacy**

The Appliance Standards Advocacy program will continue conducting many of the same activities as were conducted in the 2010–2012 program cycle, but will focus on preparing new measures pursuant to CEC's adopted Order Instituting Rulemaking ("OIR") for Title 20 Appliance Standards and U.S. Department of Energy's ongoing rulemaking for Federal Appliance Standards. Primary activities for 2013-2014 include the following:

Title 20 Appliance Standards Rulemaking

- Prepare CASE studies pursuant to CEC's adopted OIR:
    - Advocate and provide public testimony in State public proceedings
    - Conduct research and testing and submit supporting market and technical data to the CEC

- Participate in consensus negotiations with industry and energy advocacy groups (which typically develop standards levels which CEC eventually adopts)
- Develop voluntary agreements or reach standards

Federal Appliance Standards Rulemaking

- Provide support to DOE rulemaking process:
  - Advocate and provide public testimony in Federal public proceedings
  - Submit supporting market and technical data to the Department of Energy
  - Participate in consensus negotiations with industry and energy advocacy groups (which typically develop standards levels which DOE eventually adopts)
  - Develop voluntary agreements or reach standards

**Compliance Improvement**

For the 2013-2014 program cycle, the C&S team will combine the former Extension of Advocacy and Compliance Enhancement Program activities into one Compliance Improvement subprogram to enhance understanding of program objectivities and activities. The subprogram will strive to improve compliance with the Title 24 and Title 20 efficiency standards while implementing an effective sector strategy with the Workforce Education and Training Program. Primary activities for 2013-2014 include the following:

Title 24 Compliance

- Title 24 Standards Essentials Role-Based training for building inspectors:
  - Continue delivering training to plans examiners and energy consultants. Update curriculum to cover what's new in the 2013 code. *(per OP 93)*
  - Expand role-based training curriculum to additional compliance improvement market actors such as the building trades and design professionals as guided by needs assessment

- HVAC Quality Installation and Other Programs with Direct Code Requirements
  - Identify opportunities to insert code compliance modules in existing curriculum, such as training required for technicians

- On-line Compliance Training:
  - Explore training delivery mechanisms beyond the traditional classroom to include live webinars, activity-based online training, and in-field demonstrations
  -
- Tools and Process Improvements:
  - Implement tools and process improvements as identified through the building department best practices study and the Compliance Improvement Advisory Group (CIAG)

- Forms and Compliance Documents:
    - Support development of improved forms and compliance-related documentation for 2013 Title 24

- Nonmonetary Compliance Improvement Incentives:
    - Explore a pilot project designed to improve compliance by providing incentives to local governments, contractors, or other key market actors. The pilot will be based on the CIAG's guidance and may include nonmonetary incentives such as training or provision of tools designed to streamline the permitting and inspection processes for additions and alterations *(per OP 94)*

- Target Low Compliance Problem Areas:
    - Collaborate with the CEC to identify problem areas and potential compliance improvement solutions through white papers developed by CIAG members *(per OP 95)*
    - Consider pilot project to improve compliance for measures with known challenges, which may include providing incentives to contractors for pulling permits, or motivation for other market actors. *(per OP 95)*

- Develop and Conduct Outreach Campaign to Improve Compliance:
    - Collaborate with the CEC to develop and implement an outreach campaign designed to improve compliance with Title 24 and Title 20 standards. The campaign will be based on the CIAG's guidance and may include activities such as developing flyers for contractors to provide to potential customers explaining the code requirements and benefits, mini measure-based code seminars for big box store employees, etc. *(per OP 93)*

- CEA exam development, facilitation support, and maintenance
    - Collaborate with the California Association of Building Energy Consultants to improve the working knowledge, skills, analytic ability and accountability of individuals using energy compliance software and preparing the appropriate Title 24 documentation for permit submittal. C&S will support updating the beta Residential and Nonresidential CEA examinations developed in 2010-2012 to properly test applicant CEAs under the 2013 standards and facilitating the roll out of the new certification process.

Title 20 and Federal Standards Compliance

- Surveys and Technical Support:
    - Conduct surveys and provide technical support to CEC and industry to facilitate compliance.

- Education and Outreach:
    - Collaborate with CEC on implementing an education and outreach campaign targeted to distributors, retailers, contractors, and possibly consumers. *(OP 93)*

## Reach Codes

For the 2013-2014 program cycle, the IOUs will continue to collaborate with the CEC and Local Government Partnership Program to identify, and provide technical assistance to, local jurisdictions interested in adopting Reach Codes. In addition, the IOUs will continue to collaborate with CEC to provide support for developing voluntary standards to encourage buildings to achieve exemplary performance in the areas of energy efficiency. Primary Reach Code activities for 2013-2014 include the following:

Reach Code Technical Assistance

- Cost Effectiveness Studies:
    - Prepare Cost Effectiveness studies for each of the California climate zones (to be updated for 2013 Energy Building Code) that have been vetted with the CEC, resulting in expedited CEC review of reach code application submittals.

- Policy Guidelines:
    - Provide a "Road Map" of Policy Guidelines for adopting Reach Code including an overview of some of the implications and important choices in writing and adopting these types of ordinances, and recommendations intended to improve implementation and compliance.

- Ordinance Template:
    - Provide a Reach Code Ordinance "template" that establishes clear definitions of when the ordinance is triggered, including CEC-required language which states that all buildings shall meet all applicable requirements of the Building Energy Code.

- Workshops & Presentations:
    - Facilitate public workshops and presentations to interested stakeholders including elected officials, city staff, industry organizations, and community groups that address the following:
        - Critical role that energy efficiency plays in reducing greenhouse gas emissions
        - Understand how Reach Codes and complementary new construction incentive programs such as California Advanced Homes help meet CalGreen's voluntary Tier 1 and Tier 2 Energy requirements, accelerate advancement of zero net energy building practices, and mitigate project-level GHG impacts pursuant to CEQA requirements.

        - Explain the process for developing and adopting a legally enforceable Reach Code pursuant to CEC requirements

    - Work with industry organizations and other market actors to conduct outreach to local governments to inform them of available Reach Code assistance.

**Planning and Coordination (Non-Resource Subprogram)**

The Planning and Coordination Subprogram supports planning activities that improve alignment across the IOU energy efficiency portfolio with respect to future C&S program activities. C&S staff will coordinate with IOU energy efficiency portfolio programs to support efforts to prepare the market for future code adoption (i.e., improve code readiness), to ensure higher code compliance rates and advance the CPUC Strategic Plan goals for achieving Zero Net Energy.

This subprogram will consist of four elements: 1) Strategic planning and coordination; 2) Outreach within each IOU to other program areas; 3) Statewide planning and coordination; and, 4) Workforce education and training. Primary activities for 2013-2014 include the following:

Strategic Planning (per OP 91)

- Codes and Standards Collaborative:
    - Maintain a Codes and Standards Collaborative to conduct strategic planning

- Code Readiness:
    - Establish cross-functional teams, including representatives from voluntary programs (incentive, emerging technologies, and education and training), the CPUC, and the CEC, will be established to identify code readiness priorities relative to policy goals, for example: zero net energy, AB 1109, and other Action Plan objectives.

Internal Coordination and Communications

- Periodic Meetings:
    - Conduct a variety of internal coordination activities based on respective needs of each IOU, including periodic meetings with program leads in other areas as well as management teams.

- Ongoing Communication:
    - Inform planners and support groups regarding future code changes, collaboration on evaluation and regulatory matters.
    - Solicit input from other groups re advocacy efforts, aligning education and training activities with incentive programs.

Statewide Collaboration

- Integrated Dynamic Approach to Portfolio Planning:
    - To support the state's Zero Net Energy objectives, the C&S team, will work closely with new construction programs to develop an integrated approach to align new construction program offerings with base code requirements as well as reach codes where possible.
    - The C&S team will work with core retrofit programs as well as local government partnerships and third parties to coordinate offerings with anticipated code changes. *(per OP 91, 152)*

- CPUC Communication:
    - Conduct monthly calls with CPUC personnel to share progress and discuss issues *(per OP 91)*

- CEC Communication:
    - Maintain statewide weekly calls with CEC staff regarding building codes and appliance standards *(per OP 91)*

- National Stakeholders Communication:
    - Conduct regular conference calls with national stakeholders regarding appliances *(per OP 91)*

- Compliance Advisory Group Communication:
    - Host quarterly meetings with Compliance Improvement Advisory Group regarding compliance improvement activities *(per OP 91, 152)*

- Local Government Partnership Communication:
    - Provide quarterly updates to Local Government Partnership Program regarding reach code adoption progress and delivery of training to building departments *(per OP 91)*

Workforce Education and Training (WE&T)

- Sector Strategies for WE&T:
    - C&S and WE&T personnel will meet periodically to coordinate activities that will enhance support for the appropriate market actor roles responsible for new and emerging codes and standards implementation according to priorities established by needs assessments. C&S will collaborate with the WE&T Centergies sub-program to not only prepare contractors and technicians to implement current codes, but to also prepare them with technical training on advanced technologies that are projected to become part of reach codes and then the statewide code. *(per OP 92 and OP 152)*

# 2013-2014 PIP Addendum

| | | | |
|---|---|---|---|
| **Program Name** | Workforce Education and Training | **Date Submitted** | 7/2/2012 |
| **Subprogram Name** | | **Utility Name** | San Diego Gas & Electric |
| **Program ID** | | **IOU Program Contact** | |
| | | **Program Cycle** | 2013-2014 |

This form is to be used to document any required changes to the Program Implementation Plans (PIPs). The following are triggers that will require a PIP change:

1. Changes to eligibiity rules
2. Changes affecting incentive levels (indicate advice letter approval below if required)
3. Fund shifts (indicate advice letter approval below if required)
4. Portfolio Budget and Other Commission–Directed Changes
5. Changes to Program Theory/Logic Models
6. Addition or elimination of programs and/or sub-programs (indicate advice letter approval below)
7. Changes in program targets
8. Change in sub-program approach - unless the IOUs submit logic models for the sub-programs (to be defined) with IOUs
9. Changes in incented measures
10. Changes in adopted PPMs/MTIs (indicate advice letter approval below if required)

**Identify Specific Trigger (above) requiring the PIP change**

4. Portfolio Budget and Other Commission-Directed Changes

**Driver of Change:**

Revisions made to the WE&T Centergies and WE&T Planning PIPs as directed in Commission Decision 12-05-015.
Revisions made to the Connections PIP to reflect program implementation changes for 2013-2014 bridge period.
Revised logic models provided for Centergies and Connections subprograms.

**Description of Change (if advice letter approval required, indicate Commission resolution or approval and provide hyperlink to advice letter):**

WE&T CENTERGIES:
Updates and new information as directed in the Guidance Decision are reflected in the attached documents:
* 2013-2014 Workforce Education and Training Program Implmentation Plan in redline and clean versions
* Attachment 1 – Statewide response to additional information as requested by Staff
* Attachment 2 - List of SDG&E's courses

WE&T CONNECTIONS:
The statewide Connections Program is continuing with the updated information reflected in the redlined changes attached, including a revised logic model.
New information for SDG&E's programs for 2013-2014 include:
Green Pathways:
The innovative SDG&E pilot exceeded the deliverables outlined in the 1/21/2010 Green Pathways Advice Letter (SDG&E Advice 3080-G/3596-E), and is transitioning into a SDG&E local program that will scale

throughout the SDG&E service territory in 2013-2014. Research findings from the pilot phase resulted in modifications to the scope, design and delivery to address the needs of the target market and to incorporate best practices.

Energenius:

Energenius has completed the programs outlined in the 2009 PIP and the changes in the 2013-2014 PIP addendum outline specific new programs and updates in response to the CLTEESP (demand response, distributed generation, greenhouse gas emissions, etc) and the Needs Assessment. Energenius address the environmental impacts of energy production and person energy use with age appropriate programs. Additionally, changes include best practices and lessons learned in marketing strategies.

**PIP Section and/or Wording to be Changed or replaced:**

As shown in the attached revision.

**Replacement Language or Information**

As shown in the attached revision.

**Revised Energy Savings (If Any):**

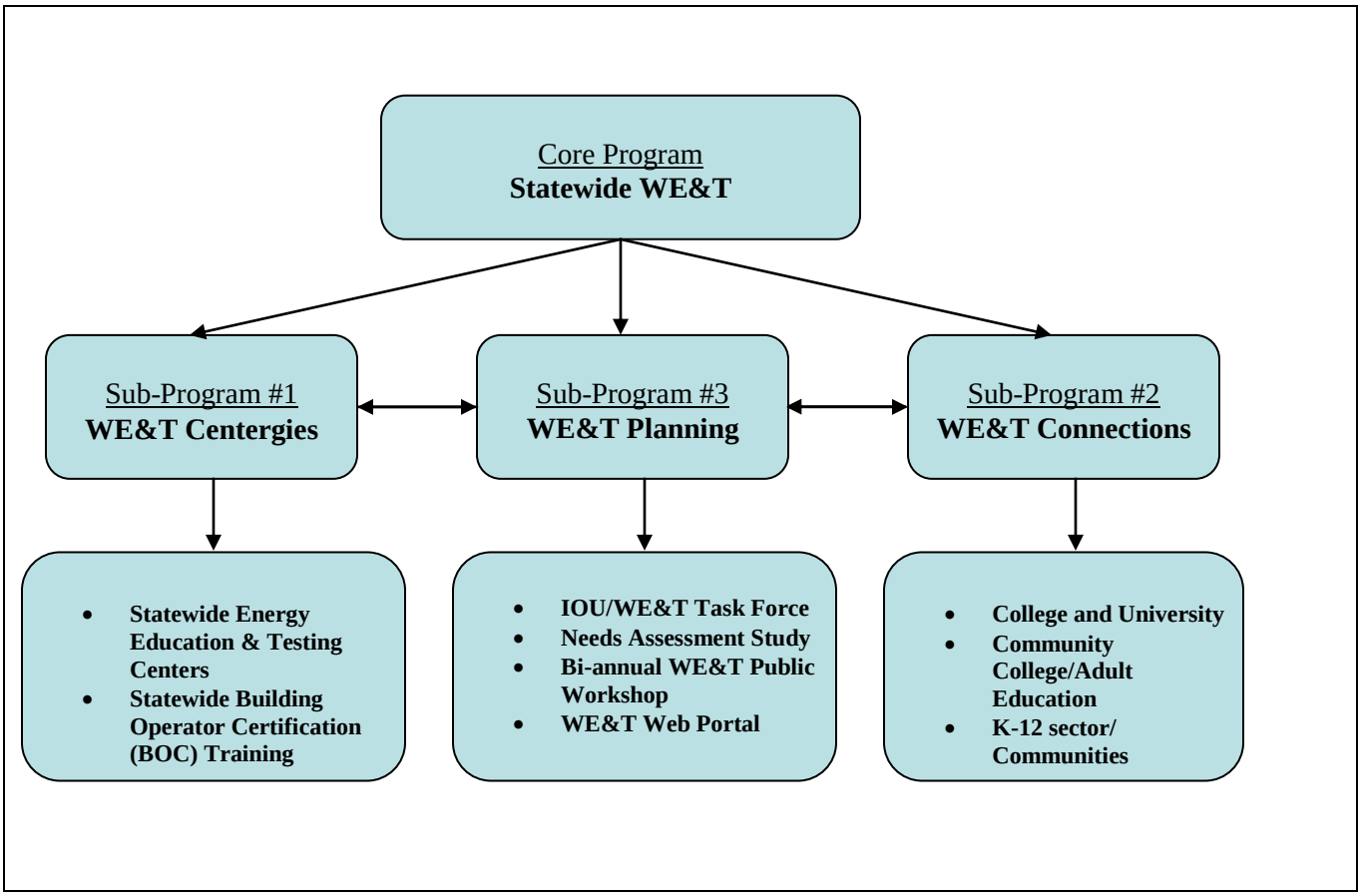
N/A – nonresource program.

**Other PIP Changes Required:**

None

1) **Statewide Workforce Education and Training (WE&T), SDGE, core program**

**Diagram I: Statewide WE&T Core Program Implementation Structure**[1]




[1] Sub-Program write-up contains detail on cross-cutting coordination and strategies with market sectors and market segments, as well as descriptions of specific shared component activities, projects and implementation models.

**2) Projected Program Budget Table (IOU specific)**

Table 1[2]

| Program Code | Program Name | Administrative Amount | Marketing Amount | Direct Install Amount | Incentive Amount | Total Budget Amount |
|---|---|---|---|---|---|---|
| | **SW Workforce Education & Training** | | | | | |
| 3254 | SW-WE&T-Centergies | $1,401,243 | $1,120,770 | $6,711,357 | $0 | $9,233,370 |
| 3255 | SW-WE&T-Connections | $317,919 | $76,544 | $491,888 | $0 | $886,351 |
| 3257 | SW-WE&T-Strategic Planning | $7,073 | $0 | $90,000 | $0 | $97,073 |
| | TOTAL: | $1,726,235 | $1,197,314 | $7,293,245 | $0 | $10,216,794 |

## 3) Projected Program Gross Impacts Table

WE&T is considered a non-resource program and thus is not expected to provide energy savings impacts for the IOU Energy Efficiency portfolio for the 2013-2014 program years. However, as part of the ongoing efforts of the IOUs and recommendations taken from future study results, the IOU WE&T programs are continually seeking methodologies that can support energy savings contributions for WE&T activities.

**Table 2 –** Not applicable for this program.

## 4) Program Description

a) Program description

The Statewide IOU Workforce Education and Training (WE&T) Program represents a portfolio of education, training, and workforce development planning and implementation funded by or coordinated with the Investor-Owned Utilities (IOUs): Pacific Gas and Electric (PG&E), Southern California Edison (SCE), San Diego Gas & Electric (SDG&E), and Southern California Gas (SCG). Education and training are vital components of each of the IOU's energy efficiency portfolio filings for 2013-2014 and are integral in supporting the achievement of IOU energy savings targets and the workforce objectives set forth in the California Long-Term Energy Efficiency Strategic Plan (Strategic Plan). Workforce Education and Training has become an important crosscutting activity for the IOUs in an effort to not only educate and train current workers, but to prepare future workers to be better able to successfully perform the jobs needed to help achieve increased energy savings targets for the IOUs and California's clean energy goals.

[2] Definition of Table 1 Column Headings: Total Budget is the sum of all other columns presented here
Total Administrative Cost includes all Managerial and Clerical Labor, Human Resource Support and Development, Travel and Conference Fees, and General and Administrative Overhead (labor and materials).
Total Direct Implementation – includes all financial incentives used to promote participation in a program and the cost of all direct labor, installation and service labor, hardware and materials, and rebate processing and inspection used to promote participation in a program.
Total Marketing & Outreach includes all media buy costs and labor associated with marketing production.
Integrated Budget Allocated to Other Programs includes budget utilized to coordinate with other EE, DR, or DG programs.
Total Budget is the sum of all other columns presented here
Definition of Sub-Program: A "sub-program" of a program has a specific title; targets; budget; uses a unique delivery or marketing approach not used across the entire program; and for resource programs, has specific estimated savings and demand impacts.

WE&T relies on statewide coordination to collaboratively create a comprehensive training platform that leverages the potential of key stakeholders with the resources, knowledge, and commitments to implement an education and training strategy that focuses on integrating existing workforce skills with new workforce needs, as well as expand outreach efforts to increase awareness of and demand for green careers.

California wants to expeditiously increase statewide workforce development and training relying on strategically coordinated planning and administration to deliver energy efficiency and demand side energy management in the public and private sectors. This effort will require concerted planning among secondary and post-secondary educational leaders, technical and professional organizations, state agencies, economic and labor development organizations, utilities, construction and manufacturing businesses that deliver energy management and efficiency solutions.

The Strategic Plan's vision for WE&T is that "[b]y 2020, California's workforce will be trained and engaged to provide the human capital necessary to achieve California's economic energy efficiency and demand-side management potential."3 To do this, the Statewide IOU WE&T Program must be constructed in an implementable form to: 1) initiate and drive long-term WE&T development and strategic planning, including identification of funding streams and market sector specific needs; 2) support community college and adult education efforts to develop education based on visible career paths in energy efficiency and related fields; 3) incorporate energy efficiency and integrated demand side energy management into traditional contractor and technician training; 4) support the creation or expansion of energy management and efficiency focused curriculum by college and university programs and foster this knowledge in clear view of students and faculty; 5) support development of K-12 curriculum to include a basic understanding of energy fundamentals, including environmental and greenhouse gas impacts as well as solutions to mitigate energy use impacts such as EE, DSM, and associated behavioral changes, identify how career education in energy-related fields can be incorporated across the grades, and bolster high school career counseling to improve community college enrollment in green job training programs; and 6) achieve the fullest participation by minority, low income and disadvantaged communities in training and education at all levels of DSM and the energy/resource efficiency industry. Diagram I illustrates the proposed program implementation structure for the Statewide IOU WE&T Program to best deliver the strategies outlined by the Strategic Plan.

Throughout the approved IOU Program Implementation period, the WE&T Program will strive to continuously initiate and facilitate ongoing dialogue with a broad group of market and education sector stakeholders to define, introduce and drive long-term WE&T development and solutions to establish EE and DSM education and training at all levels of California's educational system and accommodate the dramatic increase in EE activities envisioned by the Strategic Plan. The IOUs will modify curriculum and delivery methods to incorporate feedback and guidance from sources, including the California WE&T Needs Assessment, customer feedback from the 2010-2012 Process

[3] California Long Term Energy Efficiency Strategic Plan, p. 74.

Evaluation, and the Guidance Decision for 2013-2014. Such modifications include, but are not limited to, approaching curriculum development with the sector strategy approach.

The Statewide IOU WE&T Program includes three pivotal Sub-Programs that form an integrated and cohesive structure for implementing WE&T curriculum and related activities in support of IOU energy savings targets and the long-term strategic goals for the state of California as prioritized and outlined by the Strategic Plan and Big Bold Energy Efficiency Strategies (BBEES). These three Sub-Programs include:

i. The **WE&T Centergies Sub-Program** is generally organized around market sectors and cross-cutting segments to facilitate workforce education and training appropriate for achieving the energy savings, demand reductions and related energy initiatives required of the IOUs. The Energy Centers, which have many years of experience in creating and disseminating high-quality programs, represent the largest component of this Sub-Program and provide WE&T curriculum and related deliverables—training courses, seminars, workshops, clean energy technology demonstration, equipment efficiency testing, interactive training exhibits and lectures—to promote industry trends and developments for advancing energy efficiency as a professional discipline. For many years, they have served as the IOU's primary delivery channels for mid- and upstream workforce education and training, information dissemination, and education/outreach coordination. IOU-administered Third Party, Local Government and Emerging Technology, Codes and Standards, Heating, Ventilation and Air Conditioning (HVAC), and Energy Savings Assistance (ESA) programs, as well as other community-based training efforts, are supported by the Energy Centers to sponsor workforce training courses. (Refer to WE&T Centergies Sub-Program Section 6.1 for a more detailed discussion of 2013-2014 program implementation.)

   The Statewide Building Operator Certification (BOC) Training Partnership, the second component of this Sub-Program, will continue to play a major role in improving and maintaining California's green collar building workforce stock of building engineers, stationary engineers, maintenance supervisors, maintenance workers, facility coordinators, HVAC technicians, electricians, , and others in the facility operation and maintenance field. The IOUs have been collaborating with BOC to offer California building operators competency-based training and certification, resulting in improved job skills and more comfortable, efficient facilities. Operators earn certification by attending training and completing project assignments in their facilities. Training topics include facility electrical, HVAC, and lighting systems; indoor air quality; environmental health and safety; and energy conservation. The IOUs will work with BOC to shape and realign the BOC certification program to be consistent with the Strategy Plan.

ii. The **WE&T Connections Sub-Program** is organized around downstream and upstream relationships between the IOUs and the educational sector, entry and

intro-level community-based training efforts that support workforce development in energy efficiency, energy management, and new emerging green careers. This Sub-Program emphasizes education curriculum and related activities that inspire interest in energy careers, new and emerging technology, and future skills development to advance the energy initiatives and goals of the state. This Sub-Program involves expanded relationship-building to foster curriculum development and related training that result from existing and expanding industry needs. IOUs will work with education institutions, labor and communities to nurture interest in green careers by K-12, community college, occupational, vocational, and major university students, as well as assist in the growth of low-income and transitional workforce targeted clean energy training programs. (Refer to WE&T Connections Sub-Program Section 6.2 for a more detailed discussion of 2013-2014 program implementation.)

iii. The **WE&T Planning Sub-Program** involves the management and execution of several strategic statewide planning tasks and resulting project implementation actions initiated by the Strategic Plan. The tasks and projects are seen as instrumental in delivering mechanisms and protocols that facilitate ongoing momentum and focus on the achievement of workforce, education and training long-term goals. The WE&T Planning Sub-Program facilitates implementation and completion of the four key strategic tasks identified in the Strategic Plan to drive long-term WE&T development:

1) Form an IOU/CPUC WE&T Task Force
2) Conduct a Needs Assessment
3) Create a WE&T Specific Web Portal
4) Facilitate annual WE&T Public Workshops

(Refer to WE&T Planning Sub-Program Section 6.3 for a more detailed discussion of 2013-2014 program implementation.)

b) <u>List of current measures/curriculum</u>

Refer to WE&T Sub-Program Sections 6.1 and 6.2 for specific detail.

i. WE&T Centergies

a. Statewide Energy Education and Testing Centers (Centers)
The Centers will continue to offer and expand their curricula to current and new audiences that make up California's energy efficiency workforce. The primary target audience for each of the Center's activities and that audience's significance to California's energy efficiency future are delineated in Appendix 2. Appendix 2 also includes a more comprehensive list of existing and new educational seminars that the Centers will offer at the local and statewide level. The list reflects classes that are developed around specific technologies or installation methods as well as classes that present integration

among DSM programs, including distributed generation and demand response. NOTE: The course topics listed in Attachment 11 will be modified during the program cycle, as new technologies are introduced into the marketplace and revised codes and standards are implemented.

b. Statewide Building Operator Certification (BOC) Training Partnership
BOC will continue to be a WE&T partner with the IOUs. The IOUs will expand and improve the BOC partnership. The "measures" to be provided in the BOC program include delivery of the Level I (7-class series) and Level II (4-class series) certification courses listed below. BOC will also track certification statistics.

ii. WE&T Connections

a. College and University sector: The Statewide University program that operates at UC/CSU campuses offers the following as well as advances the Strategic Plan goals:

- IOU and /or program staff will work with the UC Office of the President of Academic Affairs and the CSU Office of Degree Programs and Educational Opportunities to 1) promote energy minor or major degree programs, 2) collaborate and/or provide expertise in the development of complementary new and revised courses that will form a comprehensive integrated approach to energy education, and 3) consult with campus-specific administrators to define additional courses needed to meet the growing need for graduates with skills in energy efficiency and related fields.
- Student interns will work with many campus groups and organizations to promote energy efficiency and green careers to the student body.
- Student interns will work with campus EOP Programs to ensure that minority, low income, and disadvantaged students are fully engaged in our energy efficiency and green career path programs. Many students do not apply for admission to college because no one in their family has ever attended college or because college seems too expensive. EOP aims to improve the access, retention, and graduation of students who have been historically disadvantaged, either socially or economically.
- Student Interns promote energy efficiency throughout the campus by performing energy assessments and providing recommended actions to operate more efficiently.
- The program provides a pathway to green jobs through professional development, training, mentoring, integrated academic curricula, internships, project based learning, and a broad-based professional networks.
- Students are offered job shadowing and internships with IOUs, universities, other entities, and government agencies.

b. Community College sector: The Community College program will better position California's workforce to meet the growing need for energy professionals as well as advance Strategic Plan goals:

- The California Community College training and education program currently provides energy efficiency courses for CCC facilities, operations, and maintenance staff in an effort to create an energy efficient environment, help in the development energy efficient policies, take advantage of DSM programs, and implement distributed generation programs,
- IOUs are in the early stages of discussion with the Community Colleges to develop a Utility Workforce Education and Training program. The first step is to gather labor market information from employers in the energy sector and use this information to develop new certificate and degree programs that focus on energy efficiency and demand side management.
- IOUs will work with campus EOP Programs to ensure that minority, low income, and disadvantaged students are fully engaged in our energy efficiency and green career path programs. Traditionally, minority, low income and disadvantaged students heavily favor community colleges because they are economically more feasible or because students' GPA or standardized test scores were not high enough to get into a university. EOP provides support and helps students transition to universities if that is the goal of the student. EOP aims to improve the access, retention, and graduation of students who have been historically disadvantaged, either socially or economically.

c. K-12 sector: The various K-12 educational components all offer the following as well as advance Strategic Plan goals:

- Ensure that minority, low income, and disadvantaged communities fully participate in training and education programs: At least 50% of each program is offered in minority, low income, and disadvantaged communities, determined by school lunch program data.
- Designed to promote green careers to K-12 students through energy and environmental curriculum and highlight green careers/jobs: Students will learn about a range of green jobs and participate in shadowing and training program and classroom instruction to help them consider and prepare for future green employment. A focus will be on experimental learning models, including contacts with both blue and white collar workers now working in the green economy.
- Designed to educate students on energy, water, renewable energy, demand response, distributed generation, and greenhouse gases and impacts to the environment, with the goal of influencing the day-to-day energy efficiency decisions of students and their households (customer awareness focused).

- Designed to educate schools on the benefits of implementing energy efficiency policies and demand response programs at their sites to impact energy use in schools.
- The IOUs and/or our third party vendors will work with the State's Department of Education (Curriculum Commission) as well as Counties' Departments of Education to be included in curriculum development advisory boards so that we can contribute to tailored K-12 curriculum that includes the science of energy, energy efficiency, and some discussion about green careers.

c) List non-incentive customer services

i. WE&T Centergies

Common Center elements include:

- Educational seminars
- Technical consultations
- Outreach efforts
- Food Service Test Protocols/Equipment demonstrations
- Tool Lending Libraries
- Educational Partnerships
- HVAC sector strategy
- Energy Design Resources integration and collaboration

These non-incentive customer services will be used to direct the Centers' customers to the IOU's incentive programs through inclusion of program materials in class course books, through information integration on Centers' class websites, and literature displays in Centers' exhibits. (Refer to WE&T Centergies Sub-Program section 6.1 for specific details.)

5) Program Rationale and Expected Outcome

a) Quantitative Baseline and Market Transformation Information

Market transformation is embraced as an ideal end state resulting from the collective efforts of the energy efficiency field, but differing understandings of both the MT process and the successful end state have not yet converged. The CPUC defines the end state of MT as "Long-lasting sustainable changes in the structure or functioning of a market achieved by reducing barriers to the adoption of energy efficiency measures to the point where further publicly-funded intervention is no longer appropriate in that specific market."[4] The Strategic Plan recognizes that process of transformation is harder to define

[4] California Public Utilities Commission Decision, D.98-04-063, Appendix A.

than its end state, and that new programs are needed to support the continuous transformation of markets around successive generations of new technologies[5].

Market transformation programs differ from resource acquisition programs on 1) objectives, 2) geographical and 3) temporal dimensions, 4) baselines, 5) performance metrics, 6) program delivery mechanisms, 7) target populations, 8) attribution of causal relationships, and 9) market structures[6]. Markets are social institutions[7], and transformation requires the coordinated effort of many stakeholders at the national level, directed to not immediate energy savings but rather to intermediary steps such as changing behavior, attitudes, and market supply chains[8] as well as changes to codes and standards. Resource acquisition programs rely upon the use of financial incentives, but concerns have been raised that these incentives distort true market price signals and may directly counter market transformation progress[9]. According to York[10], "Market transformation is not likely to be achieved without significant, permanent increases in energy prices. From an economic perspective, there are 3 ways to achieve market transformation: (1) fundamental changes in behavior, (2) provide proper price signals, and (3) permanent subsidy."

The question of what constitutes successful transformation is controversial because of a Catch-22: Market transformation is deemed successful when the changed market is self-sustaining, but that determination cannot be made until after program interventions are ended. Often, however, the need for immediate energy and demand savings or immediate carbon-emissions reductions will mean that program interventions may need to continue, which would interfere with the evaluation of whether MT is self-sustaining. Market transformation success has also been defined in terms of higher sales of efficient measures than would have otherwise occurred against a baseline absent of program interventions. The real world, however, provides no such control condition. Evaluators must estimate these baselines from quantitative factors such as past market sales that may be sparse and/or inaccurate - particularly for new products. Evaluations must also defer to expert judgments on what these baselines may have been as well as on the degree of successful market transformation[11]. Due to the subjective nature of these judgments, it is

[5] California Public Utilities Commission (2008) *California Long Term Energy Efficiency Strategic Plan*, p. 5. Available at http://www.californiaenergyefficiency.com/docs/EEStrategicPlan.pdf

[6] Peloza, J., and York, D. (1999). "Market Transformation: A Guide for Program Developers." Energy Center of Wisconsin. Available at: http://www.ecw.org/ecwresults/189-1.pdf

[7] Blumstein, C., Goldstone, S., & Lutzenhiser, L. (2001) "From technology transfer to market transformation". Proceedings of the European Council for an Energy Efficient Economy Summer Study. Available at http://www.eceee.org/conference_proceedings/eceee/2001/Panel_2/p2_7/Paper/

[8] Sebold, F. D., Fields, A., Skumatz, L., Feldman, S., Goldberg, M., Keating, K., Peters, J. (2001) *A Framework for Planning and Assessing Publicly Funded Energy Efficiency*. p. 6-4. Available at www.calmac.org.

[9] Gibbs, M., and Townsend, J. (2000). The Role of Rebates in Market Transformation: Friend or Foe. In *Proceedings from 2000 Summer Study on Energy Efficiency in Buildings.*

[10] York, D., (1999). "A Discussion and Critique of Market Transformation", Energy Center of Wisconsin. Available at http://www.ecw.org/ecwresults/186-1.pdf.

[11] Nadel, S., Thorne, J., Sachs, H., Prindle, B., and Elliot, R.N. (2003). "Market Transformation: Substantial Progress from a Decade of Work." American Council for an Energy-Efficient Economy, Report Number A036. Available at: http://www.aceee.org/pubs/a036full.pdf

imperative that baselines as well as milestone MT targets be determined and agreed upon through collaborative discussion by all stakeholders, and these targets may need periodic revision as deemed necessary by changing context.

Market transformation draws heavily upon diffusion of innovation theory[12], with the state of a market usually characterized by adoption rate plotted against time on the well-known S-shaped diffusion curve. In practice, however, the diffusion curve of products may span decades[13]. Market share tracking studies conducted 3, 5 or even 10 years after the start of an MT program may reveal only small market transformation effects[14]. The ability to make causal connections between these market transformation effects and any particular program's activities fades with time, as markets continually change and other influences come into play.

These challenges mentioned above are in reference to programs that were specifically designed to achieve market transformation; and these challenges are only compounded for programs that were primarily designed to achieve energy and demand savings. However, since the inception of market transformation programs almost two decades ago, many lessons have been learned about what the characteristics of successful MT programs are. First and foremost, they need to be designed specifically to address market transformation. "The main reason that (most) programs do not accomplish lasting market effects is because they are not designed specifically to address this goal (often because of regulatory policy directions given to program designers.)[15]" The Strategic Plan recognizes that regulatory policies are not yet in place to support the success of market transformation efforts[16], but also reflects the CPUC's directive to design energy efficiency programs that can lay the groundwork for either market transformation success or for codes and standards changes.

Above all else, the hallmark of a successful market transformation program is in the coordination of efforts across many stakeholders. The most successful MT programs have involved multiple organizations, providing overlapping market interventions[17]. The Strategic Plan calls for coordination and collaboration throughout, and in that spirit the utilities look forward to working with the CPUC and all stakeholders to help achieve market transformation while meeting all the immediate energy, demand, and environmental needs. Drawing upon lessons learned from past MT efforts, the Energy Center of Wisconsin's guide for MT program developers[18] suggests that the first step is not to set end-point definitions, progress metrics or goals. Rather, the first steps include forming a collaborative of key participants. As the Strategic Plan suggests, these may include municipal utilities, local governments, industry and business leaders, and consumers. Then, with the collective expertise of the collaborative, we can define markets, characterize markets, measure baselines with better access to historical data, and

[12] Rogers (1995) Diffusion of Innovations, 5th Ed.

[13] Example in bottom chart of this graphic from NYTimes: http://www.nytimes.com/imagepages/2008/02/10/opinion/10op.graphic.ready.html

[14] Sebold et al (2001) p. 6-5,

CPUC (2008) Strategic Plan, p. 5.

Nadel, Thorne, Saches, Prindle & Elliot (2003).

Peloza & York, (1999).

define objectives, design strategies and tactics, implement and then evaluate programs. The collaborative will also provide insights that will set our collective expectations for the size of market effects we can expect, relative to the amount of resources we can devote to MT. No one organization in the collaborative will have all the requisite information and expertise for this huge effort. This truly needs to be a collaborative approach from the start.

On December 2, 2010, the Commission issued Resolution E-4385, approving Program Performance Metrics (PPMs) for Pacific Gas and Electric Company, Southern California Edison Company, Southern California Gas Company and San Diego Gas and Electric Company for 2010-2012 statewide energy efficiency programs and subprograms. The Commission gave each PPM a metric type which indicated the reporting frequency: Metric type 2a indicates that the IOUs should report on the metric on an annual basis (unless indicated otherwise). Metric type 2b indicates the IOUs should report on the metric at the end of the program cycle.

**Program Performance Metrics (PPMs)**

Below are the approved PPMs and metric types for the Workforce Education & Training Statewide Program (Resolution E-4385, Appendix A). These PPMs will be extended into the 2013-2014 portfolio, with the clarifying definitions shown below:

| **WORKFORCE EDUCATION AND TRAINING (WE&T)** | | |
|---|---|---|
| ***Centergies*** | Percent increase in educational collaboration with partners from 2011 baseline. (Tracked and reported by educational level, and by number of partners operating in Title-1 communities.)<br>* Educational "collaboration" is defined as: seminars, outreach events and consultations as needed. These collaborations include exchanges of monetary or in-kind support and services (i.e., sharing meeting facilities, marketing/promotional services, etc.). | 2b |
| | 2. Percent increase in educational collaboration with organizations serving disadvantaged communities<br>* Educational "collaboration" is defined as: seminars, outreach events and consultations as needed. These collaborations include exchanges of monetary or in-kind support and services (i.e., sharing meeting facilities, marketing/promotional services, etc.). | 2b |
| | 3. Number of IDSM educational classes with integrated content*.<br>* There are two ways that an educational program can be identified as "integrated".<br><br>1. Integration through a balance of building systems content<br>Course content includes material on at least two building systems (i.e. mechanical, building envelope, lighting, solar, water, etc.) their relevance to one another, and how an integrated systems approach optimizes overall demand management with impacts that address energy efficiency, demand response, and smaller renewable energy systems.<br><br>2. Integration through technology content<br>Technologies discussed can be used to fulfill at least two of the three subjects of Integrated Demand Side Management (EE, DR, DG). IDSM technology examples would include dimming ballasts, Energy Management Systems, controls, or any technology with a work paper that includes both kW and kWh savings. Energy efficiency technologies result in permanent load reduction. Demand response technologies have the ability to respond to a demand response event for temporary load reduction. Distributed generation technologies deliver power to an individual building or set of buildings. | 2b |
| ***Connections*** | 1. Percent increase in educational collaboration with partners. (Tracked and reported by educational level, and by number of partners operating in Title-1 communities.)<br><br>* Educational "collaboration" is defined as: seminars, outreach events and consultations as needed. These collaborations include exchanges of monetary or in-kind support and services (i.e., sharing meeting facilities, marketing/promotional services, etc.). | 2b |
| | 2. Percent of K-12 WET Connection program participants that are from Title-1 schools | 2a |
| | 3a. Complete baseline study to determine the current number of partnerships.(Y/N)<br>3b: Number of high school continuing education outreach partnerships** in WET Connection<br><br>** Partnerships are defined as an organization, agency, unions, non-profits that provide EE related education and training for post-high school young adults. They are also groups that include education and training for minority and low income participants. | 2a*<br><br>* Starting 2011. |

b) Market Transformation Information

No Market Transformation Indicators have been approved for the WE&T Program.

c) Program Design to Overcome Barriers

The Statewide IOU WE&T Program structure illustrated by this document is intended to address several new and recent challenges and existing barriers in order to implement a sustainable long-term education and training strategy, while leveraging the resources of the CA-IOUs to help influence energy efficiency curriculum and training content among education, labor and community sectors in a way that incorporates best practices and coordinates investment throughout the state.

The national, statewide and local economic downturn poses a real barrier to change, creating the risk of distracted focus and resistance to invest in projects. The IOUs currently represent a long and stable commitment to energy efficiency and demand-side management education and training. The IOUs have demonstrated the ability to offer a targeted breadth of education and training program, but market transformation toward a new green workforce will require an urgent commitment to change by educational sector stakeholders.

The challenge of introducing new technology into the marketplace has historically relied on coordination between technology development, research and technology commercialization. IOUs have demonstrated flexibility in identifying new and emerging technology training needs and introducing workforce training courses to both private and public sectors. However, market transformation to meet target dates associated with net zero new construction and code adoptions will require a rebound in the economy and interest in new investment.

The IOUs offer a broad statewide contiguous view on workforce, education and training which few other parties have. The proposed implementation plan leverages the statewide IOU assets and resources to the extent possible to address gaps in the workforce landscape, and IOUs can act as conduits to identify new or successful local and regional workforce training models that can be migrated across the state into underserved areas via IOU implementation or IOU administration of third-party sponsored implementation. Such an effort cannot occur solely from IOU funding, so there will need to be additional financial stimulus from alternative resources.

WE&T Connections

Energy education is critical to assuring a stable and reliable supply of electricity in California. Educating students will create a new generation of Californians who understand the significance of energy in their lives, their role in its efficient use and the importance of managing our limited resources for the future. This knowledge and information can also lead to life-long energy savings habits and a concern for the environment and its limited resources for not only the students but, for their family and friends. This knowledge and education can also lead the interest in a future green career

path. However, given the budget cuts at schools, cuts to curriculum and longer work hours for teachers, getting this message across may not be possible without the assistance of these IOU sponsored programs.

WE&T Connections program components are designed to be both flexible and effective across diverse learning environments. All program components promote the science of energy, energy efficiency, demand response, distributed generation, and empower K-12 and college students to become advocates of smart energy management in their homes, schools, and communities. The program effectively combines classroom learning with hands-on activities such as:

The program will address lost opportunities in the schools market by implementing a comprehensive, innovative approach that involves incorporating:

- Some of the nation's leading energy education programs. These programs are 1) designed to promote green careers through energy and environmental curriculum, 2) designed to educate students on energy, water, renewable energy, demand response, distributed generation as well as green house gases and impact to the environment, with the goal of influencing day-to-day decisions of students and their households, 3) also designed to educate schools/facilities on the benefits of implementing energy efficiency policies and demand response programs at their sites so at to impact energy use in schools and, universities and to project energy and environmental leadership by example
- The program is developed in collaboration with natural gas, electricity and water agencies to promote and encourage the adoption of energy efficiency, demand response, distributed generation and water conservation options.
- Collaboration and integration with residential and business incentive programs that result in firm energy savings for homes and schools.

The WE&T Connections program will address the needs of schools through a combination of student, teacher, and school administrator education programs that increase their awareness and knowledge as well as provide support in developing curriculum and/or lesson plans that support these objectives. Additionally, once school-aged children learn something new like energy efficiency, they become advocates by taking that knowledge home and teaching/motivating their parents and siblings to take actions to reduce energy and water consumption. University students can conduct valuable research and effectively educate their peers and campus administrators about energy efficiency:

- Educational campaigns can result in significant energy savings on campus facilities and dorms by changing behaviors and purchasing decisions;
- Students are effective advocates, able to reach their peers, communities and high-level decision makers in promoting green jobs on campus.

- IOUs will coordinate with the Department of Education Curriculum Frameworks and Instructional Resources Division to discuss how curricula on energy efficiency fundamentals, GHG issues and global climate change can be included in the Science Framework (). Additionally, coordinate with the Dept. of Ed for inclusion of curricula of green career options in energy-related fields in the Career Technical Education Framework for 7-12.
- IOUs will update the "Resource Guide for Teachers" developed by PG&E that provides an annotated listing of sites and curricula for teachers and students covering issues related to energy, energy efficiency and the environment.
- IOUs will coordinate with partners to expand outreach into K-12 schools that have curricula on energy, water, and environmental issues (e.g., California Department of Education of Education, Water Districts, California Department of Energy, California Energy Commission, Air Quality Management Districts).
- As an outcome of the collaboration of partners representing curricula mentioned above suggestions on how to integrate career options in energy-related fields will be explored. In the interim the IOU's will review the existing curriculum programs that they support and work together to see where career options can be incorporated into their curricula.
- The IOUs and/or our third party vendors will work with the appropriate (as described in program description) K-12, Community College and University agencies responsible for developing curriculum, courses and programs needed to educate students about energy, energy efficiency and prepare them for a green career path.

d) Quantitative Program Targets

Refer to WE&T Sub-Program sections for specific details.

e) Advancing Strategic Plan goals and objectives

The proposed Statewide IOU WE&T program implementation structure, integrating WE&T Planning as a Sub-Program in parallel with the two other major statewide IOU Sub-Programs, WE&T Centergies and WE&T Connections is intended to better integrate long-term planning with WE&T implementation. As stated in the Strategic Plan, "This cross-cutting sector demands a truly statewide coordination effort that integrates energy efficiency training into a wide range of public and private programs. This effort will include the California Department of Education, the Department of Employment Development, industry and labor associations, educational institutions at all levels, technical and vocational training organizations, community based nonprofit organizations and the business community."[19]

California today is faced with an unprecedented challenge: the generation of students graduating high school in 2009 will need to stabilize carbon emissions in the 30+ years of

[19] California Long Term Energy Efficiency Strategic Plan, p. 75.

their work careers. Additionally, this generation will need to develop and train the next generation of energy technologies. Transforming California's current building industry into one that exemplifies carbon neutrality by 2020 will require major changes in our existing market infrastructure and business models. This will result in many new jobs and industries.

One of the keys to success for future implementation of energy efficiency technologies is the need to train the next generation workforce in energy-related positions. The Statewide IOU WE&T Program, supported by the strategic activities of the WE&T Planning Sub-Program activities, establishes a connection among statewide implementers for increasing the knowledge and skills of the current generation - from local code officials, energy managers, and HVAC technicians to school teachers - to develop the muscle needed to achieve market transformation.

Achieving success in creating a workforce well educated in energy efficiency matters will require large-scale, ongoing, collaborative education, and training efforts to match evolving demands for both the type of jobs and number of workers needed to fully implement the Strategic Plan. Addressing human capital resource requirements will require collaborative efforts of federal, state, and local governments; financial institutions; community-based and non-profit organizations; industry and labor organizations and utilities. These entities present potential funding sources and opportunities for partnerships.

Students benefit from energy efficiency education and training opportunities with the ultimate goal of students entering careers in energy efficiency, advancing within their established career paths, and ultimately helping the state to meet very intense energy efficiency goals. A better trained workforce will advance the purpose of DSM implementation, policy, research and development, and education.

The educational components offered by the WE&T Connections program provide energy efficiency education and training at most levels of California's educational systems. The program also ensures that minority, low income and disadvantaged communities fully participate in training and education programs at all levels of the DSM and energy efficiency industry. The expected results are that:

1. Students develop careers, and existing workers develop skills and knowledge that advance DSM business, policy, research and development, and education; and
2. Individuals from the targeted communities take advantage of programs that specialize in energy disciplines at all levels of the educational system and successfully advance themselves into rewarding careers in the energy services fields.

The Statewide IOU WE&T Program is structured to implement workforce training and workforce curriculum development in cooperation with the California Community Colleges Chancellor's Office, the California Board of Education and Adult Education Leadership. WE&T Planning Taskforce and annual workshops will help to nurture

technical training and education services that support community college and adult education within the first 12 months of the program cycle. Together, these relationships will be able to outline the foundational learning plan(s) needed to prepare students for career paths in energy efficiency and related fields. Based on experience, learning plan outlined through this collaborative effort could provide students with entry points for entering the field of energy efficiency and/or result in career development tracks within a traditional education system. IOUs would initially suggest learning plans be based on the "working backwards" exercise of asking what knowledge, skills, educational background and abilities are needed for particular sets of jobs and careers. Once these various attributes have been identified, learning plans shall be developed which will drive the development of curricula and training programs and support the knowledge and skills sets needed to prepare students for the "green collar" workforce. The Statewide IOU WE&T Program will build on existing training activities to address "gaps" in the learning plans as appropriate and diagnosed by the needs assessment.

The Statewide IOU WE&T Program is modeled to generate stronger linkages to K-12, advising on energy curriculum and coordination between K-12, Community Colleges Chancellor's Office and the adult education sector. The Statewide IOUs will exchange instruction and curricula with community colleges, industry and labor on HVAC, Energy Audits, Home Performance Retrofits and Building Operator Certification. The Statewide IOU WE&T Program will also advance consistency among the IOUs to use training curricula through established partnerships with the community colleges, vocational / technical / trade schools and apprenticeship programs.

The Statewide IOU WE&T Program establishes a framework for cross-sectional expansion of training curricula and related workforce development programs to address HVAC quality installation and maintenance, building construction, home performance audit and retrofit services, building operator certification, facilities maintenance, and other technical fields. The Sub-Programs will build on the established partnerships with key actors to deliver technical information through a wide variety of training and education services for upstream stakeholders such as contractors, installers, inspectors, plan checkers, designers, architects, engineers, vendors, installers, and other technical skilled personnel to increase actions, awareness, and attitudes toward energy efficiency.

The Statewide IOU WE&T Program as structured supports the Big / Bold Strategies adopted by the CPUC in the Strategic Plan by continuing to offer training programs on quality installation and maintenance of HVAC systems and equipment selection based on whole building design, training and certification, compliance improvement and new technologies. Education and Training will continue its focus on the building envelope and overall home performance by providing HVAC quality installation, maintenance and service courses based on ACCA (Air Conditioning Contractors of America) and other appropriate standards. Education and Training will also continue to offer programs on new and emerging technologies in HVAC (e.g., variable refrigerant flow (VRF) systems) and will encourage HVAC participants to become certified under the North American Technician Excellence (NATE) certification program or other appropriate credentials as a means of demonstrating technicians and installers' ability to perform quality work.

The Statewide IOU WE&T Program will work with Marketing Education and Outreach implementers on effective marketing and outreach strategies that will be designed to maximize participation in green career paths. For example, to increase awareness of the availability of training and career development programs, WE&T will contribute to the Web portal project to ensure that "green education" opportunities are accessible through the Web portal.

During the first 24 months of the program cycle, the Statewide IOU WE&T Program will be a guide for collaboration among the Department of Employment Development, community colleges, technical and vocational schools, industry and labor associations specifically on building job training programs and internships for students and preparing them for energy efficiency careers and related career paths. Collaboration will be aided by recruitment of key resources to help in promoting to students and continuing education participants the types of employment prospects available in energy derived from the WE&T Assessment study and other market data.

Within the first 24 months of the program cycle approval, the Statewide IOU WE&T Program structure will demonstrate its effectiveness to drive statewide coordination among key stakeholders to expand continuing education and college extension programs to include a greater focus on energy/resource efficiency, sustainability and green technologies. The Statewide IOU WE&T Program structure clearly shows the inclusion to collaborate with the UC/CSU system and California's community colleges to bring an expanded focus on energy/resource efficiency to students and faculty; utilize the extension programs available through the colleges and universities to incorporate a continuing education curriculum component; and work with these educational institutions to help them with expansion of their green degree programs. The Statewide IOU WE&T Program will seek ways of increasing awareness of the importance of energy efficiency, sustainability and green technologies to California, and the key partners will be able to positively impact participation and enrollment in educational programs and green careers.

The Statewide IOU WE&T Program enhances relationships with K-12 public and private educators to share best practices to attract students and facilitate interest in energy efficiency careers and the study of energy efficiency and GHG emissions. The WE&T Connections Sub-Program implementation, in collaboration with WE&T Planning activities, will engage industry experts and educational specialists including but not be limited to: the State Department of Education, educators working at County Offices of Education, leaders in teacher organizations [e.g., California Science Teachers Association (CSTA), California Regional Environmental Education Community (CREEC), Regional Occupational Centers and Programs (ROCP), California Integrated Waste Management Board (CIWMB), and the California Environmental Protection Agency for the K-12 market to determine the inventory of educational resources, funding mechanisms, and include a breakdown of workforce development and strategic planning needed to establish career training for energy-related fields.

The California EPA and the California Integrated Waste Management Board (CIWMB) are involved in the implementation of AB1548. This is the development of a "unified education strategy to bring education about the environment into California's primary and secondary schools."20 Identified are fourteen specific environmental topics where curriculum is currently being developed. The WE&T will engage in the State Department of Education Science Framework revision to encourage incorporation of energy efficiency and renewable energy emphasis.

The Statewide IOU WE&T Program will help steer more training outreach and green careers education toward minority, low-income and disadvantaged communities. The IOU administered ESA program is expected to dramatically expand the number of units that will receive education and weatherization services during the 2013-2014 program cycle. To meet the significantly higher goals, more communication and joint WE&T coordination will be necessary and desirable. The Statewide IOU WE&T Program creates an implementation framework to focus on expanding behavior modification in existing training programs to increase emphasis on energy efficient practices, steps that will enable installers, weatherization crews and energy specialists to build on the information they provide to minority, low-income and disadvantaged communities to achieve California's economic energy efficiency potential.

6) Program Implementation

a) Statewide IOU Coordination

As part of the overall Program Implementation Strategy, the statewide IOU WE&T program plans to institute protocols and processes to identify and facilitate statewide migration of quality training models into each IOU service area, as well as into underserved communities within the respective IOU service areas, where appropriate.

Summary table of WE&T target sectors, program implementation and implementers:

| Workforce Education and Training | Sub-Program | Sub-Program coordinated implementation |
|---|---|---|
| Schools | Green Campus; Energenius; PEAK | WE&T;<br>IOU UC/CSU/CCC Partnerships |
| Commercial Market Segments | Tool Lending;<br>Food Service;<br>Building Design Training;<br>Building Operations and Maintenance | WE&T (Energy Centers);<br>Statewide Commercial Resource Programs;<br>IOU Local Government Partnerships;<br>BOMA;<br>BOC;<br>USGBC;<br>New Construction;<br>Codes and Standards |
| HVAC Industry | Tool Lending ;ACCA; IHACI - QI/QM (ACCA standards inclusive) | WE&T (Energy Centers)<br>Community Colleges<br>Statewide Residential and Commercial Resource Programs, including their HVAC Sub-Programs |

[20] www.calepa.ca.gov/Education/EEI/workgroups/envirotopics

| | | |
|---|---|---|
| Residential Market Segments | Building Design and Construction Training;<br>Energy Partners (PG&E);<br>CLEO (SCG/SDGE) | WE&T (Energy Centers)<br>BIA – Remodelers;<br>Statewide Residential Resource Programs;<br>New Construction;<br>BPI; ESAP |
| Industrial/Agriculture Market Segments | Tool Lending;<br>Audits/Assessments | WE&T (Energy Centers)<br>Statewide Residential Resource Programs;<br>DOE |

b) Program delivery and coordination

Three areas of focus for the IOUs to deliver training curriculum to expanded audiences are:

**Joint statewide training and seminars** – comprehensive energy efficiency and clean energy educational seminars and conferences jointly hosted, promoted and sponsored among the IOUs, municipalities, government agencies, non-profits and industry experts.

**Distance learning** – web-based platform for synchronous and asynchronous access to digitally transmitted and pre-recorded (catalogued) on-line education and training modules. Distance learning enables webcasting as a communication tool to reach larger workforce audiences with specific training topics in a low cost manner. IOUs can explore co-production and access to on-line training curriculum with other agencies (i.e., CARB, CAL-EPA) to provide more comprehensive energy solutions training.

**Outreach** – Assist community-based training programs that offer energy efficiency and hands-on training green job curriculum to trainees in minority and other disadvantaged communities. These types of relationships will be coordinated with Low-Income Energy Efficiency programs and likely piloted regionally by IOUs to develop best practices, determine cost effective designs and fine tune a model for turnkey statewide migration. IOUs can help community training programs implement best practices, measure impacts and revise programs, while helping to shape and form standardize integrated resource curriculum (i.e., water, air emissions) beyond what can be offered by IOUs.

i. Emerging Technologies (ET) program

The Statewide WE&T Program will collaborate with the Emerging Technologies program in an improved manner to allow external participation in the ET process. Working closer with ET to increase knowledge and confidence in emerging technologies, the WE&T programs will help with implementation of these new technologies disseminating information and training to enhance market transformation and acceptance into the marketplace.

ii. Codes and Standards (C&S) program

The Statewide WE&T Program structure segregates Sub-Program curricula to make it easier to identify training opportunities that: 1) enhance interest in C&S career positions, 2) provide training on the codification process of energy

efficiency and green laws, 3) provide direct industry training on energy and green implementation strategies in response to current or impending codes and standards, and 4) prepare the workforce for code compliance improvement tasks.

WE&T Centergies will work closely with the Codes and Standards Program to support development of a sector strategy to support workforce development in an area with low compliance, for example, in HVAC. WE&T will maintain ongoing communications with the C&S staff to ensure coordinated development and inclusion of code-related content.

iii. WE&T Efforts

The Statewide WE&T Program will support the other IOU EE Programs as appropriate. Refer to Section 6.b.iii for each Sub-Program for additional plans, if applicable.

iv. Program-specific marketing and outreach efforts

Refer to Section 6.b.iv. for each Sub-Program, if applicable.

v. Rationale for selection of sub-contractors

Refer to Section 6.b.v. for each Sub-Program, if applicable.

vi. Non-energy activities of program

Refer to Section 6.b.vi. for each Sub-Program, if applicable.

vii. Non-IOU programs

The proposed Statewide IOU WE&T Program structure is very significant in that they represent a feasible and respected leader to help flesh out the common ground for delivering and coordinating statewide workforce training program among IOU and non-IOU sponsored trainers. WE&T as a strategic platform can help facilitate energy neutral training, coordination and funding among not only IOUs, but other stakeholders linked to California's energy plans. Refer to Section 6.b.vii for each Sub-Program for additional plans, if applicable.

viii. CEC work on Electric Program Investment Charge (EPIC)

Refer to Section 6.b.viii. for each Sub-Program, if applicable.

ix. CEC work on C&S

Please see Section 6.b.ix. for each Sub-Program, if applicable.

x. Non-utility market incentives

Refer to Section 6.b.x. for each Sub-Program, if applicable.

c) Best Practices

In addition to showing the relationship of the Statewide WE&T Program and Sub-Programs, Diagram I also illustrates the bi-directional interaction anticipated between the Sub-Programs under this structure. This represents IOU commitment to the WE&T strategic plan and its objectives, as well as IOU interests in facilitating stakeholder input in presenting, identifying and supporting IOUs efforts to create well-coordinated processes to connect and migrate local and regional WE&T models across the state based on best practices identified by a variety of stakeholders. The WE&T taskforce, with CPUC, IOU and statewide stakeholder roles can have a long-term impact on WE&T implementation plans of IOUs by maximizing the benefits of the structure presented. Regularly scheduled meetings among WE&T taskforce members will ensure that voices can be heard, IOUs implementation plans can be discussed and long-term WE&T strategic progress is addressed. As has been described in this section in some length, by layering the strategies outlined in the Strategic Plan on the Statewide IOU WE&T PIP, the IOUs see that as a sustainable framework for achieving the various goals sought by the CPUC from the IOUs.

d) Innovation

Refer to Section 6.d. for each Sub-Program, if applicable.

e) Integrated/coordinated Demand Side Management

The statewide WE&T team will continue to coordinate IDSM education and training efforts by working with IDSM program staff and as a member of the IDSM Task Force. This coordination will provide SDG&E employees, vendors, and partners with training to educate customers and foster customer participation in IDSM programs.

f) Integration across resource types

Refer to Section 6.f. for each Sub-Program, if applicable.

g) Pilots

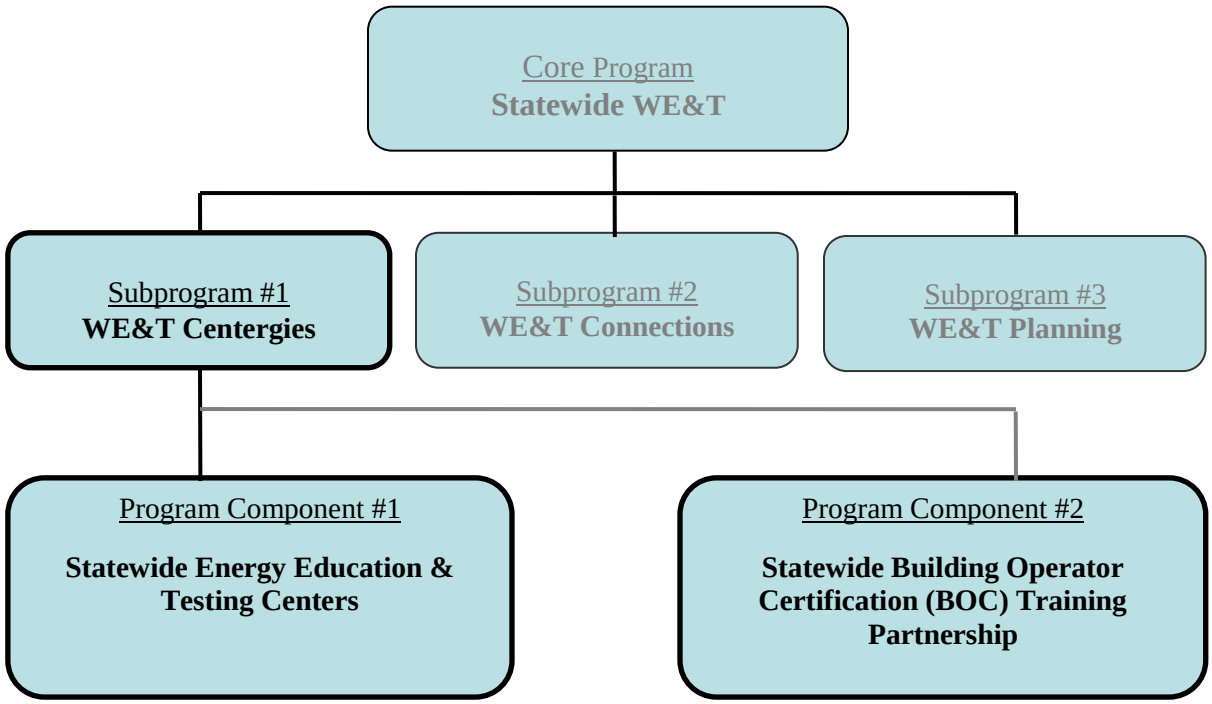
No pilot programs are planned for WE&T in 2013-2014.

In 2012 the IOUs have started work to develop an HVAC sector strategy approach, to be implemented in 2013-2014. Details are provided in the Centergies Subprogram.

h) EM&V

The utilities are proposing to work with the Energy Division to develop and submit a comprehensive EM&V Plan for 2013-2014 after the program implementation plans are filed. This plan will include process evaluations and other program-specific studies within the context of broader utility and Energy Division studies. More detailed plans for process evaluation and other program-specific evaluation efforts will be developed collaboratively by the utilities and the Energy Division. Development of these plans will occur after the final program design is approved by the CPUC and, in many cases after program implementation has begun, since the plans need to be based on identified program design and implementation issues.

6.1) Sub-Program Implementation – WE&T Centergies




a) Statewide IOU Coordination

i. Program name

The Statewide WE&T "Centergies" is a Sub-Program within the Statewide WE&T Core Program. The "Centergies" Subprogram has two primary components which are diagramed above and described in greater detail below. Parts to the "components" shall be referred to as "elements".

ii. Program delivery mechanisms

The IOUs will continue to deliver workforce education and training through two delivery mechanisms: Statewide Energy Education and Testing Centers and through the Building Operator Certification (BOC) program.

**Statewide Energy Education and Testing Centers**
Through their energy education and testing centers (Centers), California's IOUs have been supporting the energy efficiency workforce and partnering with 3rd Party and Local Government Partnerships, in some cases, for over 30 years. The Energy Innovation Center (EIC) will align with the statewide WE&T goals of the Strategic Plan by addressing the training needs of the midstream and upstream mass market, commercial, industrial, and agricultural actors through state-of-the-art classes designed to enable building professionals to reduce energy consumption in new and existing residential and small commercial buildings. As disseminators of information, the EIC is structured to deliver integrated energy efficiency, demand response, and renewable energy program information through their offerings described below. The EIC serves as a "public face" in interactions with the community and as a conduit to California's local and statewide energy efficiency programs. Through the 2013-2014 bridge period, the EIC will partner with appropriate California industry and labor organizations, professional organizations, trade and vocational schools, community colleges, universities, third-party entities, government partners serving low-income or disadvantaged communities, and other IOU and POU education and training centers. By delivering technical information through a wide variety of courses and technical consultations, theEIC will support and enhance programs which address demand side management (DSM), demand response (DR), distributed generation (DG), water and energy use, codes and standards, emerging technologies, renewables, and all incentive programs. The EIC will ensure maximum effectiveness and impacts needed to achieve long-term energy savings goals for California. With some variation at the local level, the EIC has and will continue to evolve its elements to:

- Deliver high-quality integrated educational seminars to train members of the energy efficiency workforce, including entry-level contractors, disadvantaged community members, university and community college students, architects, food service facility designers and operators, HVAC engineers, equipment installers, manufacturers, developers, and commissioning agents. Based on factors, including changes in technology, changes in codes and standards, and feedback from seminar participants, seminars will be modified to more effectively integrate topics such as distributed generation, DR, and EE as described in section 6.2.e and 6.2.f. Seminars will continue to include transferring skills on energy audits to members of the EE workforce at various stages in their careers—novices to seasoned energy auditors.

- Provide technical consultations and equipment demonstrations through building design plan and equipment schedule reviews, technical advice on new equipment and system technologies, technical advice on best-practice methods, and site visits for identifying energy efficiency opportunities. Site visits shall not replicate the efforts of the energy audits program, but rather be conducted when necessary to provide technical advice.

- Where Outreach falls under the EIC, provide on- and off-site outreach programs for disseminating technical EE information, and promoting utility energy efficiency incentive programs to green- and white-collar building professionals. Outreach programs will include, but not be limited to: on-site facility tours, off-site short presentations about Center's offerings, participation in environmental fairs and events. Centers shall work with their IOU's marketing groups so as to collaborate, but not duplicate efforts.

- Design, certify, and maintain food service equipment test protocols that allow for unbiased measurement of energy efficiency and production capacity while engaging manufacturers and chain operators to test equipment and build user accessible performance results databases. This data provides the foundation for future training programs across the Food Service spectrum as well as the technical support for rebate and other programs provided by the IOUs.

- Expand and integrate tool lending library programs that provide building and system performance measuring instrumentation, instrument use information, and measurement protocols. Tool lending libraries will loan tools free of charge to people working on short-term EE projects in California. Patrons will include building operators, facility managers, designers and other professionals who use the tools for building diagnostics, site analysis, power and energy consumption studies, research projects, and educational efforts.

- Expand energy efficiency educational partnerships with institutions that include government, professional, and trade organizations that will help Centers deliver IOU programs and information to a broader audience. Examples of such groups include, but are not limited to the U.S. Green Building Council, Building Owners and Managers Association, American Institute of Architects, American Society of Heating, Refrigerating, and Air-conditioning Engineers, the Association of Energy Engineers, the Illuminating Engineering Society, Institute of Heating and Air Conditioning Industries, Air Conditioning Contractors of America, Affordable Comfort Inc., Building Performance Institute, Residential Energy Services Network, Apprenticeship Training Programs, North American Technician Excellence, the National Restaurant Association, Foodservice Consultants Society International, North American Foodservice Equipment Manufacturers, National Environmental Balancing Bureau, Stationary Engineer Unions, U.S. Environmental Protection Agency / Department of ENERGY STAR, American Society for Testing and Materials, the California Energy Commission, California Division

of Apprenticeship Standards, International Brotherhood of Electrical Workers, National Electrical Contractors Association, Sheet Metal and Air Conditioning Contractors' National Association, Counselors of Real Estate, Institute of Real Estate Management, and the International Facility Management Association. More detail on educational partnerships is available as part of the Statewide WE&T Connections Sub-Program.

- Support building energy efficiency by developing training sessions to prepare the marketplace for new HVAC codes (acceptance testing and HERS verification), technologies, and innovative whole building approaches to new and existing buildings. Since the HVAC Big Bold initiative will expand training and education aimed at the HVAC industry, the WE&T program will coordinate carefully to complement HVAC industry training by providing educational support to related market actors such as energy consultants, Home Energy Raters, engineers, architects, and home performance contractors. It is anticipated that the robust HVAC industry training proposed by the HVAC program will create important collaboration opportunities to not only increase training opportunities, but to embellish energy center offerings and impacts.

- Increase statewide Energy Design Resources (EDR) Integration. (EDR) is an existing statewide energy efficiency resource website featuring design materials on how to effectively integrate energy efficient designs into nonresidential facilities. EDR has begun developing the structure to expand the materials and tool offerings to include residential design requirements. While EDR is not funded through WE&T, EDR content is very relevant to the Centers' WE&T direction and goals. Centers will integrate EDR content (online classes, case studies, materials, etc) as statewide resources that are relevant to specific classes, outreach efforts, and consultations.

The table below summarizes common Center elements defined above.

| Centers' Elements | SCE AGTAC | SCE CTAC | PG&E ETC | PG&E PEC | PG&E FSTC | SDGE EIC | SCG ERC | SCG FSEC |
|---|---|---|---|---|---|---|---|---|
| WE&T Seminars | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Technical Consultations | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Outreach | No** | No** | Yes | Yes | Yes | Yes | Yes | Yes |
| Food Service Test Protocols | TBE | Yes | N/A | N/A | Yes | N/A | N/A | Yes |
| Tool Lending Library | Yes | TBE | Yes | Yes | TBE | Yes | TBE | TBE |
| Educational Partnerships | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

TBE = To be established (based on information collaboration with other Centers)
** Outreach efforts not part of this Center and occurs in other parts of the utility
N/A = Not applicable to Center's primary target audience

**Table 5 –SDG&E's Centergies Program Goals**

| SDG&E Energy Innovation Center | Program Target 2003 | Program Target 2014 |
|---|---|---|
| Training Sessions | 150 | 150 |
| Technical Consultations | 100 | 100 |
| Outreach Events | 50 | 50 |
| Tool Loans | 20 | 20 |

NOTE: Goals are expressed as full-year performance to be prorated according to the effective date of the final decision approving the 2013-2014 portfolio.

**NOTE:** Training Sessions are at least two hours in length and include educational materials specially developed for each session. Training Sessions are presented live and/or on-line. On-demand web-based courses will count once toward Sessions goals. Outreach events are at least one hour in length, but do not include handouts specially developed for such events. Outreach events include meetings and educational events sponsored by parties outside the EIC and do not include training sessions. Technical consultations are technical advice interactions provided directly to a design team or an individual contractor, owner or customer. All Training Sessions are at least two hours in length and include educational materials specially developed for each session. Training Sessions are presented live and/or on-line. Outreach events are at least two hours in length, but do not include handouts specially developed for such events. Outreach events include meetings and educational events sponsored by parties outside the ETC, PEC and/or FSTC and do not include training sessions. Technical consultations are technical advice provided directly to a design team or an individual contractor, owner or customer.

A. Changes for 2013-2014 Statewide Program Coordination through IOU Energy Centers:

The IOUs will modify Centergies curriculum and delivery methods to incorporate feedback and guidance from sources, including the California WE&T Needs Assessment, customer feedback from the 2010-2012 Process Evaluation, and the Guidance Decision for 2013-2014. Such modifications include, but are not limited to, approaching curriculum development with the sector strategy approach.

**1. Heating Ventilation and Air Conditioning (HVAC)**

IOUs will incorporate and integrate HVAC education and training programs into its Workforce Education and Training Centergies sub-program to deliver a dedicated, industry-specific education and training opportunities targeted at all levels of the HVAC value chain. As part of this effort, IOUs will convene various stakeholders from, but not limited to, community colleges, trade organizations, professional organizations, employers, and apprenticeship/pre-apprenticeship programs including through the IOU-sponsored Western HVAC Performance Alliance stakeholder collaboration group, which has WE&T-specific committees already built into its structure. This will allow for identifying skill gaps and to identify opportunities for collaboration in a coordinated effort toward implementing recommendations needed to close gaps at all levels of the industry.

**HVAC Sector Strategy Plan:**

In response to the Guidance Decision, the IOUs have begun work in 2012 to develop a plan as described below to expand their educational efforts toward more direct effect on trade organizations that have memberships involved with installation and maintenance of commercial HVAC systems. IOUs will test a non-residential HVAC sector strategy. A core component will be the development of a multi-stakeholder partnership to develop a full implementation plan to apply the CALCTP sector strategy approach to the HVAC non-residential industry. The IOUs will begin with Quality Maintenance to provide the foundation, and then include a Quality Installation sub-strategy. Cornerstones of the Quality Maintenance implementation plan include identifying priority emerging technologies for improving EE related non-residential HVAC systems, identifying the knowledge, skills and abilities (KSAs) professionals need to install and maintain systems efficiently and safely as well as the linkage of these KSAs to ANSI or ISO certifications, and, developing a steering committee.

IOUs will collaborate on a statewide memorandum of understanding (MOU) with the California Division of Apprenticeship Standards. The MOU will provide a framework for partnering with labor, trade, and professional organizations that resembles the existing CALCTP program. Such an MOU will help to reinforce cooperation in achieving goals of the sector strategy test of having certified training modules, performance based principles to test and diagnose the HVAC system, site information for the contractor to design and implement real solutions for customer comfort and efficiency, training that takes good HVAC technicians to the next level and gives them the tools to maximize efficiency, comfort and safety of customers in the construction of new systems, and real-time analysis to track and maintain data from completed projects by trained participants.

Because of early activities with sector strategies, IOUs will be applying recent lessons learned from their related efforts within Commercial EE to the HVAC sector strategy, as it develops.

IOUs will work with qualified partners to institute a test that will enable HVAC workforce member to attend various HVAC classes and receive credit towards industry-recognized certifications or other appropriate credentials. The IOUs will also contact and extend partnership opportunities designed to improve installation and maintenance quality of Commercial HVAC units.

The IOUs have initiated discussions to determine the parameters of an HVAC sector strategy, to be deployed in 2013. The IOUs have identified a core group from across lines of business, and externally, the IOUs have begun to discuss pilot concepts with the other IOUs and external stakeholders such as the

Western HVAC Performance Alliance and the Division of Apprenticeship Standards.

Based on best practices from CALCTP, the IOUs recommend starting with a Needs Assessment to determine where gaps and opportunities exist, prior to determining the HVAC sector strategy's specific objectives and goals. The initial research and discussions have pointed the IOUs towards developing a concrete project within HVAC non-residential Quality Maintenance (QM). This is due to various reasons, including the fact that advancing HVAC Quality Installation is often based on building a larger foundation of contractors and customers adopting QM and establishing associated relationships of trust. Additionally, the IOUs believe QM forms a stable and focused basis for testing a sector strategy because it is based on a single consensus industry standard. Lastly, due to the fact that a sustainable QI program is not yet in-market, any initial sector strategy test would ostensibly be premature.

With Quality Maintenance as a test, the IOUs intend to glean lessons learned from that approach, to be subsequently extended into the quality installation approach to the HVAC sector strategy.

The IOUs will endeavor to have skills standards for HVAC installations established by the end of 2013. The IOUs will continue to provide necessary training as a component of the quality installation and quality maintenance programs. The current design is geared toward providing the highest possible level of installation and maintenance expertise for contractors and technicians working within the HVAC subprograms. The IOUs will continue to use the basic foundations of Title 24 acceptance testing regulations and the consensus HVAC industry standards as the basis of requirements for this training. The IOUs will continue necessary training as a component of HVAC programs. These programs will continue to evolve as needed to meet program changes as they develop.

In order to estimate costs associated with requiring certification or sector strategy-induced skills standards, the IOUs will collaborate starting in 2012 with the Commission's Energy Division through the HVAC EM&V Project Coordination Group (PCG) on the new, baseline research needed to best address questions regarding impacts or potential benefits, according to appropriate EM&V best practices.

**2. Support for California Advanced Lighting Controls Training Program (CALCTP)**

The IOUs will continue to partner with CALCTP to offer CALCTP trainings as part of their portfolio of classes to various sectors of the advanced lighting controls workforce, including electricians, contractors, business managers, installers, specifiers, marketing reps, and designers. Where appropriate, IOUs

will serve as program advisors and instructors, and provide direct financial and in-kind support to help sustain the program. IOU contributions will augment funding and support from other stakeholders, including employers, unions, other training partners, and manufacturers. Where appropriate, IOUs will continue to provide letters of support to secure grants to help support CALCTP and will continue to serve on the CALCTP board of directors and advise CALCTP curriculum developers.

To assess mandatory or voluntary incentive-based approaches to promoting high-road skills standards as part of the HVAC sector strategy initiative or CALCTP training, IOUs will work with relevant resource program managers to identify opportunities to create or enhance incentive programs that are linked to the participation of members of the workforce who have specific qualifications and/or credentials. For example, IOUs will explore the opportunity to provide an additional incentive directly to the customer if the customer hires a CALCTP certified electrician, in order to help create demand for participation in IOU-supported training programs such as CALCTP. The same model can be applied to the HVAC industry as well as other sector strategy approaches.

In response to the guidance decision (at p. 283), the IOUs provide the following information about the CALCTP program.

| Request | **CALCTP Information** |
|---|---|
| (1) data or estimation of the incremental customer cost, if any, of requiring skill standards; | (1)When the program requires CALCTP certified installers, the cost to the customer for the labor component of the project may be 10% - 15% more than prior when no certification was required. |
| (2) data or estimation of the average and range of permitting/compliance costs across permitting jurisdictions in the IOUs' service territories; | (2) Compliance and permitting cost are directly associated to the cost of proper training programs for designers, installers, manufacturers, etc. which may be equivalent to an additionally 20% to the project cost. However, proper collaboration with industry associations and manufacturers may offset this cost. |
| (3) data or estimation of impacts, if any, mandatory skill standards would have on program participation rates; | (3) With proper incentive levels and education of the segment, it is anticipated that adoption/participation would increase since the misperceptions of advanced lighting control systems, potential for demand response and how DR or ADR works will be corrected causing more demand for the control solution. |
| (3) data or estimation of impacts, if any, mandatory skill standards would have on program participation rates; | (4) It has been proven with advanced lighting control system assessment projects at PG&E, SCE and SDG&E that the customer will achieve a minimum of an additional 30% savings over traditional lighting efficiency measures. And dependent upon the level of control allowed to individual employees, savings may increase an additional 5% - 10%. With the opportunity to participation in DR, the customer will achieve even greater cost savings due to the ability to shave or control peak loads. The actual dollar values will be determined as the program adoption occurs and customer site performance is monitored and data collected. |
| (5) any other potential benefits associated with higher standards, such as fewer call-backs, lower frequency of customers over-riding control systems, lower life-cycle costs, and increased consumer uptake of measures based on higher quality and certainty. | (5) Additional benefits include: a. systems do not get overridden due to better understanding as well as the system being designed and installed. Also, ease of proper training of customer personnel regardless of turnover with the local certified installer; b. IOU assessments have shown that fewer, if any, call backs will be experienced when the system is installed by a certified installer. In contrast, numerous call backs were experienced before the system was able to be commissioned when a non-certified installer was used. c) increased proper maintenance, d) higher visibility of actual energy use in lighting due to the potential of graphic interfaces and other reporting. e) ability to track GHG emission reductions. f) create market disruption as customers begin talking to others about how well their advanced lighting control system is working and saving them money due to proper design and installation. |

### 3. Coordination with Whole House Home Performance Program (WHHPP)

The IOUs will develop and produce a core set of offerings in 2012 that will be geared to providing interested contractors and technicians with the program knowledge necessary to provide entry, as well as support for their continued participation into WHHPP.

To increase emphasis on workforce training for WHHPP, the utilities will work with various trade organizations to share existing and future course offerings for their membership. The sharing of these courses is intended to expand the relevant knowledge base of partnering organizations, with regards to WHHPP, and thereby improve the quality of energy efficient products installed throughout California.

SDG&E will continue its current efforts to offer "continuing education units" for organizations such as AIA, USGBC, CSU San Marcos, NATE , and other certification programs to be approved.

In consultation with local governments, the utilities will expand their training networks to include specific contractor and technician training. In addition, the utilities will work with local governments to identify geographic listings of contractors and technicians who will address community needs and comply with local codes and standards. In addition, the IOUs will conduct a gap assessment with local governments to identify additional needs not currently addressed.

SDG&E will continue to work through its local government partnerships to identify and market to contractors in areas served by these local jurisdictions.

- Coordination with Energy Savings Assistance Program (ESAP) Training and Certification

  In 2012 the IOUs will engage with various Community Based Organizations, Local Training Facilities and Community Colleges to identify the most appropriate methods to partner with them to serve disadvantaged members of their communities. In 2013-2014, based on results of discussions with other relevant organizations, the IOUs will develop agreements to offer or share existing curricula with these partners to better serve their communities. These curricula will be designed to provide potential employment tracks within EE through entities such as trade organizations, IOU weatherization programs and weatherization programs offered through State agencies.

- Real Estate Agent Training

  In 2012 the IOUs will make an initial introduction of courses designed to stimulate interest within the Real Estate community to expand their knowledge of benefits of EE in resale of residential and commercial properties as well as provide continuing education opportunities through partnership with various local, state and national oversight entities. Consultations in 2012 with relevant stakeholders are planned to continue into 2013-2014, so that ongoing feedback can lead to continuous improvement of these efforts. In 2013-2014 these offerings will be restructured, if necessary, and expanded to meet increased needs of these groups.

  The utilities in 2012 will make initial entries into partnerships with various real estate groups within their territories in an attempt to gauge possible obstacles to WHHPP trainings to enhance knowledge of EE by their memberships. In addition, the first forays into workshop offerings will be targeted at areas likely to be receptive to the sessions. In 2013-2014 the partnerships and offerings will be increased to provide a better understanding of the value of WHHPP in real estate transactions. Consultations in 2012 with relevant stakeholders are planned to continue into 2013-2014, so that ongoing feedback can lead to continuous improvement of these efforts.

**4.** Additional information Required in Guidance Decision

- Serving Low Income and Disadvantaged Communities

  IOUs will build partnerships with community-based organizations to offer on-location joint utility workshops in disadvantaged communities. These workshops will promote IOU low income programs, training, and certification opportunities at IOU Energy Centers and community-based organization locations. IOUs will explore providing presentations and materials in languages other than English, as appropriate to each community and partnership, to overcome any barriers of communication to customers in the disadvantaged communities. Please see additional information regarding efforts to serve low income and disadvantaged communities in Attachment 1 to this addendum.

- Other Program Coordination

  WE&T will work with the Continuous Energy Improvement Program to introduce the CEI process, lessons learned, and case study input to community colleges and universities. CEI has a goal of integrating into energy engineering curriculum. IOUs will also work with CEI to assess and determine specialized WE&T training to help target working energy

management professionals, industry professionals, and those pursuing education in universities and colleges. IOUs will also continue with WE&T coordination and cost sharing to bridge the linkages and integrate sector strategy approaches.

In 2013-2014, WE&T will work with the Benchmarking and IDSM Programs in similar manner as proposed for the Continuous Energy Improvement Program to introduce the processes, lessons, and case studies curriculum to working energy management professionals, industry professionals, IOUs will consider a sector strategies approach in furthering development of these collaborative effort.

- Safety Related Training
  The IOUs currently conduct Natural Gas Appliance Testing (NGAT) training where appropriate, and in particular when working with providers of low income weatherization programs. No lead or asbestos abatement certification is currently required as part of IOUs' low income weatherization training programs, only identification of potential conditions, because licensed contractors are expected to obtain such training as required.

- Attachments to Addendum

  Attached to this addendum as Attachment 1 is additional information the Staff requested be provided in its May 24, 2012 guidance documents, Appendix F.

Attached to this addendum in Attachment 2 is SDG&E's list of courses and programs planned for 2013-2014, using the template provided in the Guidance Decision (Appendix C). Course offerings may be modified, based on market training demands and input from industry stakeholders. Per WE&T's Joint Advice Letter[21], IOUs will redesign and structure select courses offered in 2013-2014 such that they become part of a series.

**Statewide Building Operator Certification (BOC) Training Partnership**
In addition to IOU coordination of Energy Center activities, the IOUs will continue to offer Building Operator Certification training to the commercial building workforce in their territories.

Building operators are a sector of California's green collar workforce that will continue to play a major role in improving and maintaining California's energy efficient building stock.

Buildings at all scales—small commercial to high-rise commercial and universities—that are designed to operate at a high level of energy efficiency and

[21] SG&E 2260-E-B/2041-G-B, SCG 4249-B, SCE 2588-E-B, and PG&E 3212-G-B/3852-E-B

comfort often fall short of design expectations for many reasons, including unexpected occupancy or use patterns, malfunctioning controls, incorrect installation, and equipment that falls out of calibration over time. Building operators and facility managers play major roles in ensuring buildings are performing at the level of efficiency and comfort they were designed to perform.

Building Operator Certification (BOC®) is a national program providing education and accreditation in the field of energy efficiency of commercial and institutional buildings. BOC has been recognized by the American Council for an Energy Efficient Economy (ACEEE) as one of the country's "Exemplary Programs." With more than 6,000 facility professionals earning the credential, BOC is widely recognized by key employers as a means to distinguish skill proficiency for energy management in buildings.

As an active national training program, BOC is well positioned to provide training for workers looking to establish or enhance their building energy efficiency skill sets as well as those who may need foundational building and energy efficiency training as an entry point to a growing clean energy career path. BOC's target workforce audience includes building engineers, stationary engineers, maintenance supervisors, maintenance workers, facility coordinators, HVAC technicians, electricians, operations supervisors, operations technicians, and others in the facility operation and maintenance field.

The BOC curriculum supports a credential at two levels. The Level I certification provides a strong grounding in commercial building systems, the key energy using equipment within the building, and how improved energy management technology and practices can reduce operating costs, improve comfort and productivity, and reduce the building's carbon footprint. The Level II certification builds on the Level I competencies with additional technical specificity in key building energy use areas such as HVAC, controls, and electrical equipment. In total, the BOC curriculum offers a comprehensive 130 hours of training. A list of class topics for Level I and II are provided in the Appendix 2.

*BOC Beyond the Classroom*

BOC offers a classroom training component supplemented by both an exam process for credentialing and a practicum component. Participants utilize a set of project assignments which help ensure that energy management principles are well understood and can be actively applied in buildings. The program has had numerous third party evaluations over the past 10 years and has been rated very positively by participants and their employers. These evaluations have consistently reported significant energy savings for employers who utilize credentialed BOC employees. Utilities across the country are supporting BOC and many utilize the core training program as a means for professional development of their internal staff.

*Employers and BOC*

BOC is being used by employers across the country for their energy management training needs. Public agencies, private employers, property managers, schools, universities, and healthcare institutions are all active BOC participants. Many companies and public institutions use BOC as a component of their professional development track for their employees. Examples of employers using BOC include California State University System, Irvine Company, Providence Health System, Raytheon, State Farm Insurance, and Washington State General Administration.

*IOUs and BOC*

The IOUs have been collaborating with BOC to offer California building operators competency-based training and certification, resulting in improved job skills and more comfortable, efficient facilities. Through a coordinated effort, the four California IOUs offer BOC training to their commercial and institutional customers. The statewide program combines classroom training, exams and in-facility project assignments to train and certify building engineers and O&M technicians in the practice of energy efficient building operation and maintenance. NEEC has implemented the program for the IOUs since 2002.

The IOUs will work with BOC to shape and realign the BOC certification program to be consistent with the California Long Term Energy Efficiency Strategy Plan (Strategic Plan) as well as other guiding documents, including the California WE&T Needs assessment and the Guidance Decision. Changes to the BOC curriculum and program will include:

- Following up with program participants to assess content implementation into existing facilities;
- Expanding the number of and improving the dissemination of case studies of model energy efficiency projects conducted by program participants in combination with other demand side management (ex: onsite generation and demand response) improvements when applicable;
- Incorporating BOC materials and findings into broader IOU Centers' curriculum and vice-versa;
- Better integration between BOC and other utility and utility-sponsored integrated EE, DR, and distributed generation programs;
- Better integration between BOC and other utility-sponsored energy efficiency education and other demand side management programs, including the BOMA Energy Efficiency Program (BEEP);
- Continuous updating of curriculum materials to include information about monitoring and operating zero-net energy buildings;
- Emphasizing diagnostic and troubleshooting strategies in BOC curriculum and including materials of the use of measurement equipment; and
- Developing an annual awards program for BOC program participants annual awards program to recognize graduates for their energy efficiency building

operations implementation efforts, including improved building performance from measured energy savings, documented improvement in occupant satisfaction/comfort, or document tenant complaints.

- Per feedback received from the 2010-2012 Process Evaluation via Opinion Dynamics, offering the BOC four-part webinar series as a cost-effective way to address a growing demand for web-based learning, increasingly limited budgets among building operations staff, and for continuing education credits for maintaining certification.

- As resources allow, working with local workforce investment boards (WIBs) to develop specific programs to offer BOC trainings to experienced, but displaced building operators at a significant discount. Such programs will also include opportunities to implement course material into actual buildings as well as development of "soft skills," including resume writing and interview techniques.

*Local BOC Program Variations among IOUs:*

IOUs will implement the BOC program statewide as described above throughout their territories.

**2013-2014 BOC Course and 4-Part Technical Webinar Series Targets**

| | 2013 | | | 2014 | | |
|---|---|---|---|---|---|---|
| | Level 1 | Level 2 | Webinar | Level 1 | Level 2 | Webinar |
| SCE | 4 | 2 | 0 | 4 | 2 | 0 |
| PG&E | 4 | 4 | 2 | 4 | 2 | 2 |
| SoCalGas | 1 | 1 | 1 | 1 | 0 | 1 |
| SDG&E | 2 | 0 | 1 | 1 | 1 | 1 |

iii. Incentive levels

Not applicable.

iv. Marketing and outreach plans, e.g. research, target audience, collateral, delivery mechanisms

Each of the Energy Centers will develop and distribute at least two (2) course calendars per year to potential attendees, including mid- and upstream target groups and past participants. The ETC's course calendars will be mailed using a database of more than 60,000 names. For the PEC, distribution will be made to 45,000 potential attendees. Over the years, the Energy Centers have identified and cataloged these individuals as having the greatest capability of exerting significant influence on the energy efficiency decisions of customers based on the multiplier effect. Energy Centers will continue to expand their marketing efforts by incorporating innovative and creative approaches to reach new target

audiences including industry and labor partners, colleges and universities, local governments, and third party partnerships, and will continue to cross-market their courses through its established relationships with various professional organizations. Energy Centers have and will continue to rely on email promotions to people in their combined database of potential students. The Centers will continually update their database to ensure accuracy and targeted marketing for seminars.

Training sessions and workshops will be marketed through SDG&E's Energy Innovation Center's education and training website (seminars.sdge.com), the Energy Upgrade California web site, professional organizations' websites, HVAC distributors and vendors, California Community Colleges, energy fairs, trade shows, and energy efficiency / environmental events designed to increase awareness of the Energy Centers and their education programs to prospective participants. In addition, other programs in SDG&E's portfolio will support the activities of the EIC by recommending classes and services and collaborating to develop new courses targeted to their individual needs.

Over the past several years, the Energy Centers have worked with labor and industry to qualify many of their courses for accreditation. Through these outreach efforts, the EIC has been able to certify many of its residential classes for continuing education credits from the following organizations: , North American Technical Excellence (NATE), American Institute of Architects (AIA), U.S. Green Building Council (USGBC), and California State University San Marcos. The U.S. Green Building Council (USGBC) implements a continuing education program for its LEED™ Accredited Professionals to maintain their accreditation, thus providing another target audience for the Energy Centers' courses. The EIC will continue to reach out to these and other industry groups and labor organizations, and will expand their marketing to vocational training institutions and programs which serve low-income, disadvantaged communities.

The Energy Centers will leverage their long-standing partnerships with the California Community Colleges, UC/CSU system, State of California Community Services Department, USDOE Industrial Technology Program, the Building Operator Certification (BOC), and the California Energy Commission Industrial and Agricultural Programs during 2013-2014 as part of its overall marketing and outreach efforts to attract and train the next generation of the green collar workforce. In addition, the EIC will partner with the Energy Savings Assistance Program (ESA) to improve, expand, and extend training offerings to disadvantaged communities. The EIC will also coordinate with the ESA Program to enhance recruitment of low-income workers.

The EIC works directly with the IOUs on coordinating the seminars and events relating to food service. The statewide food service energy center team provides the technical support for the statewide Energy Wise Food Service Equipment rebate programs and for target market incentives for food service. The target

audience for EIC and the statewide energy center activities is to a significant extent; corporate or franchise customers whose decision makers are located outside of SDG&E's service territory or, more likely, outside of California. EIC maintains close communication with the other IOUs and the food service energy center teams in order to provide coordination of programs or information aimed at these customers.

v. IOU program interactions with CEC, ARB, Air Quality Management Districts, local government programs, other government programs as applicable

*Carbon neutrality* – ETC will support AB32 compliance by incorporating waste and greenhouse gas (GHG) emissions reduction information into all appropriate training courses. EIC will prioritize its training and DSM efforts based on the carbon content of sources used to meet building energy loads and by challenging people to eliminate carbon consumption. Technical expertise, educational programs and support for the Big Bold Zero Energy New Home goal and California's vision of achieving zero net energy residential buildings by 2020 and commercial buildings by 2030will also be made, as well as training on methods needed to achieve deep energy savings retrofits for existing homes.

*Codes and Standards* – The Energy Centers will continue their long-standing partnership with the Codes and Standards team and the California Energy Commission (CEC) to offer training on the latest updates to the Title 24 Energy Standard through improved code compliance and design / installation methods for exceeding code requirements in residential new construction and HVAC retrofits.

EIC and the statewide food service energy center team provide technical support to staff of the CEC as Title 20 appliance regulations are developed for commercial food service equipment. Efficiency regulations for commercial kitchen equipment tend to go hand-in-hand with the voluntary ENERGY STAR program. The ENERGY STAR database and criteria are used to qualify (through testing and labeling) the top quartile of equipment efficiency while CEC seeks to through regulation the bottom quartile of equipment on the same list.

For the major equipment categories and candidates for national energy and water savings, the the statewide food service energy center team will provide technical support to establish efficiency criteria for EPA's ENERGY STAR program. On an appliance-by-appliance basis, the statewide food service energy center team will work with EPA and leading manufacturers to implement ENERGY STAR for commercial food service equipment and to support the Federal Energy Management Program (FEMP) interagency program on energy-efficient federal purchasing.

The statewide food service energy center team will continue to work with the LEED "Working Group" to finalize the list of recommended proscriptive measures and baselines for energy modeling of commercial food service facilities.

This group provides insight and submits formal CIRs on EA Credit 1 to the Retail Core Committee to help mature the language to yield a clear guideline for all types of retailers, including restaurants.

vi. Similar IOU and POU programs

The food service (FS) programs offered by the IOUs are coordinated through two levels, first at the FS program level through interactions between FSTC (PG&E), FSEC (SoCal Gas),and the Energy Innovations Center (SDG&E) to develop program offerings, schedule combined outreach programs, and develop support programs such as Rebate Workpapers. Second, the FS programs are coordinated at the Energy Center level through the statewide Energy Center coordinating committee. The Food Service Coordination deals with the scheduling and logistics of cooperative events such as seminars and supporting outreach materials, workshops, Executive Planning Committee meetings, outreach events such as trade shows, joint energy efficiency program advertisements, and trade articles and general promotion of both the seminar and rebate programs.

b) Program delivery and coordination

Between 2013-2014, the Energy Centers will work closely with all programs to coordinate and conduct seminars and workshops that address the knowledge and skill gaps of builders, developers, contractors, designers, installers, plant engineers and operators, agricultural owners and managers, and city and county building department staffs. Additional services will include technical assistance and support, consultations and tool loans.

i. Emerging Technologies program

The Energy Centers will continue to coordinate and collaborate with the Emerging Technologies program to introduce new equipment, installation practices, and whole building concepts to key market actors. Such support helps expand implementation of new energy efficiency products and services. For example, Energy Centers partner with Emerging Technology projects by: developing demonstration and testing facilities, jointly developing curricula, organizing product showcases, and incorporating new products into training sessions.

The EIC will do more to support California's vision of achieving zero net energy residential buildings by 2020 and commercial buildings by 2030 through the Big Bold Zero Energy Home Program and California Solar Initiative (CSI) by creating a focused training curriculum and resource support center. In addition, the EIC will collaborate with the Emerging Technologies (ET) program to coordinate training programs for training the trainer and training programs with information about technologies on the horizon for introduction to the marketplace.

ET will also play a significant role in advising the EIC on fixed and portable displays and exhibits for innovative technologies.

The EIC works directly with ET programs on issues and technologies of mutual interest. Specifically, EIC has worked to bring ventilation controls and water heaters to market, using ET funding where appropriate.

In 2013-2014, Business Incubation Support or Technology Resource Incubator Outreach (TRIO) will focus on providing training and networking for developers of energy saving technologies.

The IOUs will coordinate efforts with the Codes and Standards program and with the California Energy Commission to identify critical early planning workforce training needs for advanced technologies.

IOUs will collaborate with their respective Emerging Technologies groups, the statewide Emerging Technologies Coordinating Council, State agencies, and IOU codes and standards groups to identify and deliver on opportunities for teaching targeted parts of the workforce about emerging technology products as they relate to energy savings opportunities through energy efficiency and demand response. WE&T programs will also include content on proper installation and commissioning of ET products/systems.

ii. Codes and Standards program

The Centers will collaborate through their educational seminars with compliance improvement efforts planned by the codes and standards (C&S) program. Typically, these efforts will focus on training of building department staff. Centers will focus on building standards training for architect, engineers, energy consultants, home performance contractors, home energy raters, and green building programs.

The Energy Centers will directly impact improved compliance with Title 24 energy standards through rigorous updates that go beyond new construction to include revolutionary impacts on the existing housing market. The EIC will work with HVAC contractors and building department officials to overcome information and training barriers to code compliance and enforcement. Since 1998, the Energy Centers have proactively offered training on Title 24 code updates and changes to residential / small commercial building standards. The EIC will continue to go “beyond code” by providing state-of-the-art, building science-based information about the best available systems, technologies and techniques for minimizing building and operational energy consumption while optimizing whole building or system performance and occupant satisfaction or enhanced productivity. Additionally, the statewide food service energy center team provide technical support to C&S staff for Title 20 appliance and Title 24

building regulations as relating to commercial food service equipment, operations and facilities.
In collaboration with WE&T, C&S will enhance support for the appropriate market actor roles responsible for new and emerging codes and standards implementation according to priorities established by needs assessments. C&S will collaborate with the WE&T Centergies sub-program to not only prepare contractors and technicians to implement current codes, but to also prepare them with technical training on advanced technologies that are projected to become part of reach codes and then the statewide code.

In support of the Zero Net Energy goals, C&S will continue to build on existing training offerings and will expand activities to coordinate more closely with WE&T. In collaboration with WE&T, C&S will develop a sector strategy to support workforce development in an area with low compliance, for example, the Commercial Air Conditioning Quality Maintenance and Installation Program. C&S will maintain ongoing communications with WE&T staff to ensure coordinated development and inclusion of code-related content
WE&T programs will offer market actor-specific training on Codes and Standards to address ongoing code changes and code compliance.

iii. WE&T efforts

*Energy Centers*
The Centers will collaborate and coordinate where possible to be in alignment with California's Strategic Plan. Statewide collaboration among Centers will increase sub-program consistency and information/cost sharing for what the Centers offer to their customers (seminars, tool lending library development assistance, portable exhibits).

*BOC Program*
In alignment with the goals of the Strategic Plan, BOC's curricula incorporate relevant information about the Emerging Technologies, Codes and Standards, and HVAC Quality Installers/Quality Maintenance programs. As appropriate, BOC instructors will enhance the depth of the learning experience by discussing new technologies and ways to meet and exceed the state's code and standards.

Through its two levels of training and certification, BOC offers supplemental training in existing technical positions by providing knowledge and skill building for technician-level facilities personnel including building engineers, stationary engineers, maintenance supervisors, maintenance workers, facility coordinators, HVAC technicians, electricians, general repairers, and head custodians.

BOC has been recognized by several industry and labor organizations as one of value to its members. This recognition reflects the program's efforts to meet the needs of these organizations through solid, industry relevant curricula development. Among the organizations recognizing BOC's training program are

the International Facility Management Association (IFMA), the Building Owners and Managers Institute (BOMI), the National School Plant Management Association (NSPMA), local chapters of the society of healthcare engineering, and the California State Employees Trades Council (SETC). NEEC also partners with California statewide partnerships including the UC/CSU/IOU Partnership and other Local Government Partnerships (e.g. Association of Monterey Bay Area Governments).

iv. Program-specific marketing and outreach efforts (Budget provided in Table 1)

*Energy Centers*
Each of the Centers will distribute their own print calendars to a more focused target audience to ensure notifications of Centers' offerings reach key actors. Innovative and creative approaches will be applied to attract and retain new customers and market actors to the Centers. This will include aligning the Centers' activities with corporate and statewide direction. Centers will contribute content to the Statewide Web portal described above and below. Classes and other Center activities will be promoted through the following venues: the Centers' print calendars, collaboration with professional and trade organizations, Center's Web sites, Centers' email communications with students who have opted in to receiving email notifications, and other partnerships, including non-profit organizations and existing academic channels (community colleges, UC/CSU).

Centers will continue to promote and collaborate on marketing efforts with established and new partnerships involving other utility segments, across utilities, and with government, academic, research, professional/trade, and non-profit organizations focused on efforts supporting the Strategic Plan.

*BOC Program*
Northwest Energy Efficiency Council (NEEC) works closely with the IOUs to promote Building Operator Certification (BOC) seminars. IOU-sponsored BOC classes shall be mentioned in Energy Centers' calendars and email-marketing campaigns targeting commercial and institutional customers. NEEC will also target potential participants with direct marketing materials including informational brochures, case studies and bi-annual bulletins. The program's website also serves as a promotional channel. In 2013-2014, BOC will undertake promotional activities that build on customer interest in national initiatives such as the ENERGY STAR® Challenge and LEED for Existing Buildings. It will also work with large employers to organize closed-enrollment sessions for facilities engineering departments at a single site. Where the IOUs offer the Building Owners and Managers Association (BOMA) Energy Efficiency Program seminars, BOC shall be cross-marketed.

BOC will continue to promote training and certification through its highly successful educational partnerships with professional associations representing the facilities engineers. These include the International Facility Management

Association (IFMA), Building Owners and Managers Association (BOMA), Association of Physical Plant Administrators (APPA - higher education), National School Plant Management Association, and the American Society Healthcare Engineering (ASHE). BOC will participate in the annual events and program meetings of these associations to share information about opportunities to reduce operating costs through energy efficient building operations.

v. Non-energy activities of program

The Centers and BOC shall remain focused on delivering content centered around integrated DSM programs, including EE, DR and distributed generation. The Centers have and will continue to explore other program topics that do not have direct energy connections, but that do contribute to improving California's building stock. Such topics include indoor air quality, occupant comfort, recycling, and environmental stewardship and preservation. The LEED™ Green Building Rating System provides an outline for other topics that can help inform Centers' program managers and instructors about other resource types.

The Energy Centers provide low-cost centralized meeting space for the benefit of program implementers. Volume of activity for non-energy program participants at the EIC lowers the average cost of energy efficiency training due to volume discounts. Non-energy participants are not subsidized by this program. EIC supports water conservation through demonstrating hot water heating and use in FS to customers.

vi. Non-IOU Programs

IOU program will interact with CEC, ARB, Air Quality Management Districts, local government programs and other government programs as applicable. The Centers will interact with the CEC to develop and deliver training to support improved compliance with building and appliance standards. Compliance with retrofit HVAC requirements is a key strategy in the Big Bold Initiative that will rely on collaborative training efforts.

The Sacramento Municipal Utilities District (SMUD) operates its Energy Technology Center (ETC) that provides similar functions as the IOU's Centers. The IOUs will reach out to SMUD to collaborate on WE&T elements. The IOUs are active partners with Community Colleges to support and embellish green career technical education. For example, active participation in the California Advanced Lighting Controls Training Program (CALCTP) is currently underway with several institutions, including Pacific Gas and Electric Company, Southern California Edison, SDG&E, and California Lighting Technology Center. SDG&E offers CALCTP in partnership with the Cuyamaca Community College. The program delivers a "train the trainer" series of classes to industry groups such as electrical unions and trade organizations.

The ETC has conducted weatherization-related training for the State Department of Community Services Development in partnership for the last 30 years. In fact, the ETC was originally designed as a hands-on weatherization training center for State programs. In conjunction with other EPC efforts, BOC has and will continue to support CEC adoption of minimum energy efficiency standards.

Additionally, the statewide food service energy center team works with or provides support to the following programs:

- National Restaurant Association (NRA): The FSTC has maintained a working relationship with the NRA since its inception in 1987. In fact, the NRA co-funded the build out of the FSTC and provided cofounding on several occasions over the past two decades. The FSTC is currently recognized as a [technical] partner in NRA's new Conserve Initiative that is featuring energy efficient and green restaurant design and operation. (http://conserve.restaurant.org/)
- Multi-Unit Architects, Engineers and Construction Officers (MAECO): MAECO is a study group of the NRA that the FSTC has supported for two decades, attending meetings and presenting the results of our research into restaurant efficiency.
- California Restaurant Association (CRA): In parallel with the NRA, the statewide food service energy center team has worked with the California Restaurant Association, providing energy efficiency education in publications and equipment shows. The FSTC authored a series for the CRA bulletin titled the Green Sheets since 2003. (http://www.fishnick.com/saveenergy/greensheets/)
- Thimmakka - Ethnic "Green" Business Program**:** FSTC served as a technical resource, helping develop low cost / no cost energy savings solutions for small and ethnic restaurant operators in the greater bay area. (http://www.thimmakka.org/)
- Bay Area Green Business Program**:** FSTC served as technical resource, helping to develop energy assessment checklist for green business certification program. (http://www.greenbiz.ca.gov/)
- Green Café Network (Small restaurant "Green" business program): FSTC served as technical resource, helping develop low cost / no cost energy savings solutions for small restaurant operators in SF. (http://www.greencafenetwork.org/)
- California Urban Water Conservation Council (CUWCC): The FSTC has been a primary resource to the CUWCC and members such as EBMUD and Metropolitan Water as they developed educational and incentive programs for commercial foodservice in California. (http://www.cuwcc.org/)
- Foodservice Consultants Society International (FCSI): The FSTC has maintained a working relationship with this professional association for many

years. More recently, we have been very active in its outreach initiatives, specifically the Super Regional education program. (http://www.fcsi.org/)

- North American Food Equipment Manufacturers (NAFEM): NAFEM has been a long supporter of the statewide food service energy center team, tapping our technical resources for its educational initiatives. We have also been involved in developing the On-Line Kitchen Protocol and the new Life-Cycle Cost Models. The FSTC is a member of NAFEM's Technical Liaison Committee. (http://www.nafem.org/)
- ASHRAE: The FSTC has been an active participant in ASHRAE program, research and standards activities. Technical committee work is currently focused on commercial kitchen ventilation, refrigeration and water heating. ASHRAE is one of the FSTC's key channels to the engineering and large facility design communities.
- ASTM: ASTM is the standards organization that ratifies and publishes all of the standard test methods developed by the FSTC. To date, the foodservice test method portfolio includes more than 35 test methods.
- International Mechanical Code (IMC): FSTC submits code change proposals with respect to commercial kitchen ventilation. Over the past few years, we have been successful in over 20 code proposals.

vii. CEC work on PIER

The PEC will collaborate with Lawrence Berkeley National Laboratory, the National Institute of Standards and Testing, and consulting firms on a CEC PIER project to support the development of the Universal Translator (UT). The UT is a software tool that supports building operators and engineers to document building energy performance and energy efficiency project planning. The UT is an extension of the PEC's tool lending library described in Section 4.i.

The statewide food service energy center team works closely with the CEC PIER program on such issues as Commercial Kitchen Ventilation, hot water heating and distribution, and advanced kitchen appliances. FSTC works as a research contractor for PIER in conjunction with PG&E's CEE and ATS departments on Kitchen Gas and Electric use and hot water research.

viii. CEC work on codes and standards

The Centers will work with the CEC and the IOU C&S programs to improve code compliance through coordinated education and training delivery. For more details on these integration efforts, refer to the HVAC WE&T PIP. The ETC provides expert consultation and advice for building standards development as well as advocacy support in collaboration with the Codes and Standards Program.

ix. Non-utility market initiatives

The Energy Centers collaborate with certification and training initiatives by the following organizations: North American Technician Excellence (NATE), Affordable Comfort, Inc. (ACI), Building Performance Institute (BPI), National Association of the Remodeling Industry (NARI), American Institute of Architects (AIA), BuildItGreen (BIG), and Home Energy Rating System (HERS) Providers [California Building Performance Contractors Association (CBPCA), U.S. Green Building Council (USGBC), American Society of Heating, Refrigerating, and Air-conditioning Engineers (ASHRAE), California Home Energy Efficiency Rating System(CHEERS) and CALCerts].

The statewide food service energy center team utilize their relationships with ENERGY STAR and various restaurant and food service industry organizations to promote their programs and leverage these relationships to pursue SDG&E's efficiency objectives. (Refer to Section 6.2.b.v. above.)

c) Best Practices

Centers will develop classes, displays, and materials with current information that highlights and demonstrates best practices for efficient installation and equipment through field-experience and case studies from existing programs, including Savings by Design and Energy Design Resources. Centers' offerings will emphasize whole building and system performance in conjunction with design intent. Implementation of hands-on learning methods that are applied in the field creates an opportunity for partnering with EM&V and/or 3rd party evaluators to follow up with course participants to assess impact upon practice and/or energy savings. A description of this pilot program appears in Section 6.1-g below. The Centers will continue to implement best practice methods as prescribed in prior statewide evaluation reports, including "Evaluation of the 2003 Statewide Education and Training Services Program" by Wirtshafter Associates, Inc., 2005 and "2004-2005 Statewide Education, Training and Services Program Evaluation" by KEMA, 2007.

Many of the training programs conducted through the Energy Centers incorporate adult learning theory by utilizing a "hands-on" approach that enables students to visualize and experience the impact proper system design, installation and maintenance can have on operation and energy efficiency. For example, the ETC's functional HVAC training unit, a "best practice" implemented by the ETC in 2005, provides participants an opportunity to see first-hand how proper charging, duct sealing and other actions made to HVAC systems impact their energy use and the ETC's training house provides students with the ability to see and touch quality insulation installation, high efficiency lighting exhibits, weatherization techniques and more.

The EIC's lighting exhibits allow students to experience both poor and good quality lighting. Participants in the Energy Audits class use tools from the Tool Lending Library and the EIC to learn ways of measuring building performance; the overcast sky simulator

and Heliodon allow class participants to test physical models of buildings for daylighting and shading performance; and interactive energy modeling software classes provide students the opportunity to learn effective use of the software in a group setting with an instructor.

Throughout the 2013-2014 bridge period, the EIC will develop additional training props and equipment for use in many of the courses offered to enhance learning and provide real-world experience in the classroom. In addition, both Energy Centers will expand their courses to include more "Train the Trainer" classes to expand the reach of their training efforts and materials. See Section 6.1.g.iii for more information on "Train the Trainer" activities.

FSTC, through its research, testing, and constant customer contact continually updates its technology and operational practices knowledge base. The Best Practice partner Program is a manifestation of this constant improvement.

The ETC also interacts with Affordable Comfort, Inc., in a leadership, planning and strategic mode to audition and recruit the best talent and state-of-the-art topics for delivery in California, capitalizing on long-term relationships that gain access to best practice providers.

BOC teaches commercial and institutional facility staff how to operate and maintain building systems for energy efficiency, optimal performance, and occupant comfort. BOC combines classroom training, exams, and in-facility project assignments to train and certify building engineers and operations and maintenance technicians in the practice of energy-efficient building operation and maintenance. The curriculum was developed to provide knowledge and skill building for technician-level facility personnel including HVAC technicians, electricians, general repairers, and head custodians. BOC curriculum is taught by practicing professionals who implement best practice building operations strategies toward improving building energy efficiency. The curriculum is updated on a regular basis. Trained instructors share best practices with one another as BOC curriculum is updated on an annual basis.

d) Innovation

In 2013-2014, the IOU Energy Education and Testing Centers will undertake three pilot projects that will serve to shape programs for future filings. These pilot projects are discussed in Section 6.1-g below. The Centers will also continue to keep their Centers and offerings up-to-date with current and upcoming technologies.

- *Increased use of the Internet to deliver education and training programs as real-time simulcasts, real-time Webinars, and archived on-demand classes*: While these applications have been implemented by some Centers in the past, all Centers will implement and progress this delivery method further to reach a wider audience and to increase program cost-effectiveness.

- *Expanded curriculum to support California Energy Efficiency Action Plan for 2020*: The IOU Centers will develop teaching material on topics such as climate change, energy neutral growth, effective mass transit and Plug-In Hybrid Vehicles, and effective implementation of green technologies. Centers will need to pilot, experiment and partner with local Universities, science museums and other parties with expertise to provide a balanced view on these complex topics.
- *Emphasis on Adult Learning Principles*: Centers will complete the revision of seminar content and curriculum based on adult learning principles to which they were exposed as part of the KEMA program evaluation effort "2004-2005 Statewide Education, Training and Services Program Evaluation", submitted in 2007. Such learning principles emphasized hands-on "learn by doing" training. Some members of the Centers' training staff at the centers have been trained on these principles and will integrate them with the goals of promoting energy efficient behavior participating in available EE programs. The expected benefit of utilizing Adult Learning Principles is an increase in participant retention of knowledge, awareness and comprehension leading to greater EE behavior and program impact.
- Centers will work together and collaboratively with other utility groups (i.e. Emerging Technologies) to develop new exhibits with up-to-date technology that can be either replicated and/or shared across utilities to maximize cost-effectiveness of new exhibit development.
- Centers will work together and collaboratively with other utility groups and stakeholders to create an educational series describing paths to zero net energy residential buildings by 2020 and commercial buildings by 2030. This is in support of CPUC and CEC commitments and directives.

*BOC Innovation*

As a credential program, BOC is uniquely positioned to maintain a long term relationship with graduates through its certification renewal program. Graduates must earn continuing education hours annually to maintain the BOC credential. This provides an opportunity to direct graduates to the utility education and training centers to earn continuing education hours towards renewal.

Energy efficiency project work also qualifies for continuing education. Graduates may earn continuing education hours through engagement of EE and DR projects at their facilities. In 2006, almost 20% of BOC graduates earned hours through completion of efficiency projects. Finally, BOC graduates and their supervisors are informed about energy efficiency and demand response program opportunities through the BOC Bulletin, a bi-annual newsletter mailed to 1,500 California IOU customers.

Continue, and even increase, utility presence at BOC trainings: Students expressed satisfaction with utility account representative presentations in BOC classes. This should be continued and even expanded on by involving account reps in promoting BOC to key accounts in advance of the course series start date.

e) Integrated/coordinated Demand Side Management

Centers will develop their programs to incorporate other DSM opportunities, including demand response (DR), and distributed generation. The Centers have taken the first steps toward integrating DG and energy efficiency into their exhibits and educational seminars. They have also developed seminars and exhibits focused on DG, EE, and DR The next step is to work with the DG and DR groups to develop programs that integrate the three in a way that is consistent with other utility programs and with the long-term energy efficiency strategic plan towards zero net energy residential buildings by 2020 and commercial buildings by 2030. Centers will integrate training offerings with codes and standards programs as described in section 6-b above.

NEEC recognizes California's demand side management needs are not fully addressed through energy efficiency alone, but rather through a blend of multiple DSM options including rigorous building and codes and standards, demand response, and on-site generation. The BOC curricula are structured to offer flexibility for the incorporation and promotion of relevant demand side management options (rebate and non-rebate) available through the IOUs. NEEC has and will continue to work with the IOU's to customize BOC curriculum to the California market to address technologies and practices associated with demand reduction and to stimulate uptake of utility programs in energy efficiency, demand response, and on-site generation. In 2005 and 2006, BOC curriculum modules were supplemented with material on the topics of enhanced automation strategies for demand reduction and operational best practices to ensure persistence of savings from building retro-commissioning. In 2008, BOC curriculum modules were supplemented with material on the topic of O&M practices for sustainable buildings covering a full range of resource conservation topics. The curricula are also flexible to include information pertaining changes and/or implications to support implementation of and compliance with the CEC's Title 24 to Title 24 2008 Building Energy Efficiency Standards, AB32 (Greenhouse Gas Reduction bill), and other initiatives.

In 2013-2014, WE&T will work with the Benchmarking and IDSM Programs in similar manner as proposed for the Continuous Energy Improvement Program to introduce the processes, lessons, and case studies curriculum to working energy management professionals, industry professionals, IOUs will consider a sector strategies approach in furthering development of these collaborative efforts.

f) Integration across resource types

IOU Centers recognize that energy efficiency can be achieved through programs that go beyond traditional energy efficiency education and training. The Centers have and will continue to offer seminars and build partnerships that remain focused on energy efficiency and go a step further to show the benefits of energy efficiency upon other areas (e.g., air quality). The Centers will also work together and collaboratively with other utility groups and stakeholders to incorporate the benefits of achieving efficiencies with other types of resources (e.g. water efficiency) upon whole building energy use. This integration can be achieved by developing courses on specific topics like water efficiency

since any use of water requires energy consumption. The highest impact for water efficiency integration occurs when water is also heated on site. The LEED™ Green Building Rating System provides an outline for other topics that can help to inform Center program managers and instructors about other resource types.

BOC's Level II course structure offers unique flexibility to integrate the curricula from other resource management areas relevant to building operation and maintenance such as water, waste, and indoor air quality. Level II supplemental classes are offered in tandem with core classes to customize the course series to regional and topical interests in the California building operator market. Three one-day supplemental classes in the topics of water efficiency, O&M for sustainable buildings, indoor air quality, and demand response have been developed and successfully delivered to 500 building operators since the program's inception.

g) Pilots

No pilots are proposed for Centergies Subprogram. Several sector strategy initiatives will be pursued in coordination with IOU programs, as discussed in previous sections.

h) EM&V

The utilities are proposing to work with the Energy Division to develop and submit a comprehensive EM&V Plan for 2013-2014 after the program implementation plans are filed. This plan will include process evaluations and other program-specific studies within the context of broader utility and Energy Division studies. More detailed plans for process evaluation and other program-specific evaluation efforts will be developed collaboratively by the utilities and the Energy Division. Development of these plans will occur after the final program design is approved by the CPUC and, in many cases after program implementation has begun, since the plans need to be based on identified program design and implementation issues.

7) Program Diagram

See above Section 6.2.

8) Program Logic

Below is the logic model for the WE&T Centergies Subprogram.

The activities specified in the logic model focus on several types of actions. One is to promote and market center services to target audiences. These activities involve gathering labor market information from employers in the energy sector and designing programs to meet their needs. They also include leveraging existing relationships with colleges, and professional and trade organizations to market courses and other energy center offerings.

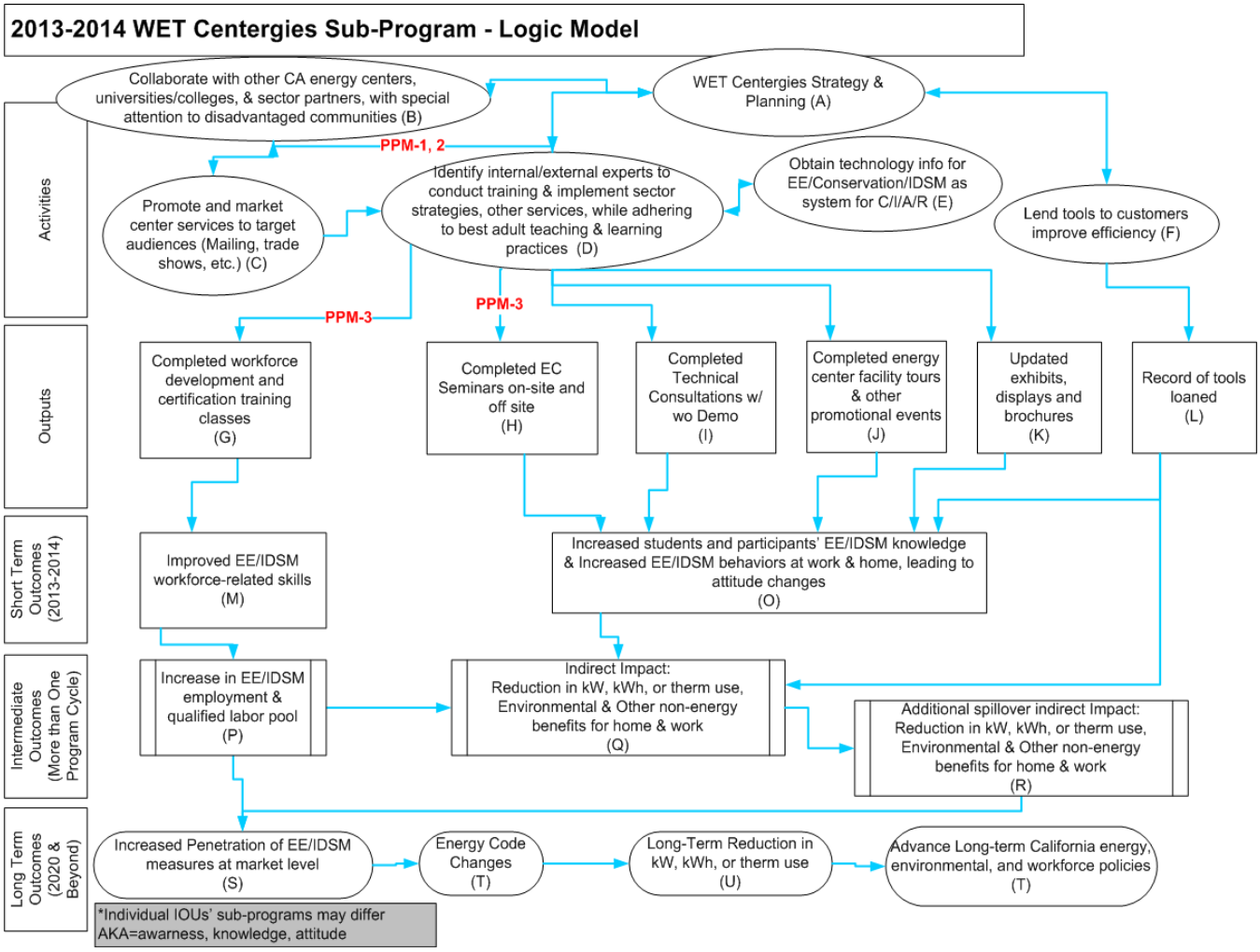
A second activity focus is marketing and reaching out to disadvantaged communities to facilitate energy-related job skills in those communities. This will be accomplished by

partnering with industry and labor organizations, professional organizations, trade and vocational schools, community colleges, third-party entities, government organizations and other partners that service low-income or disadvantaged communities in order to reach members of these communities and bring them into energy center training programs.

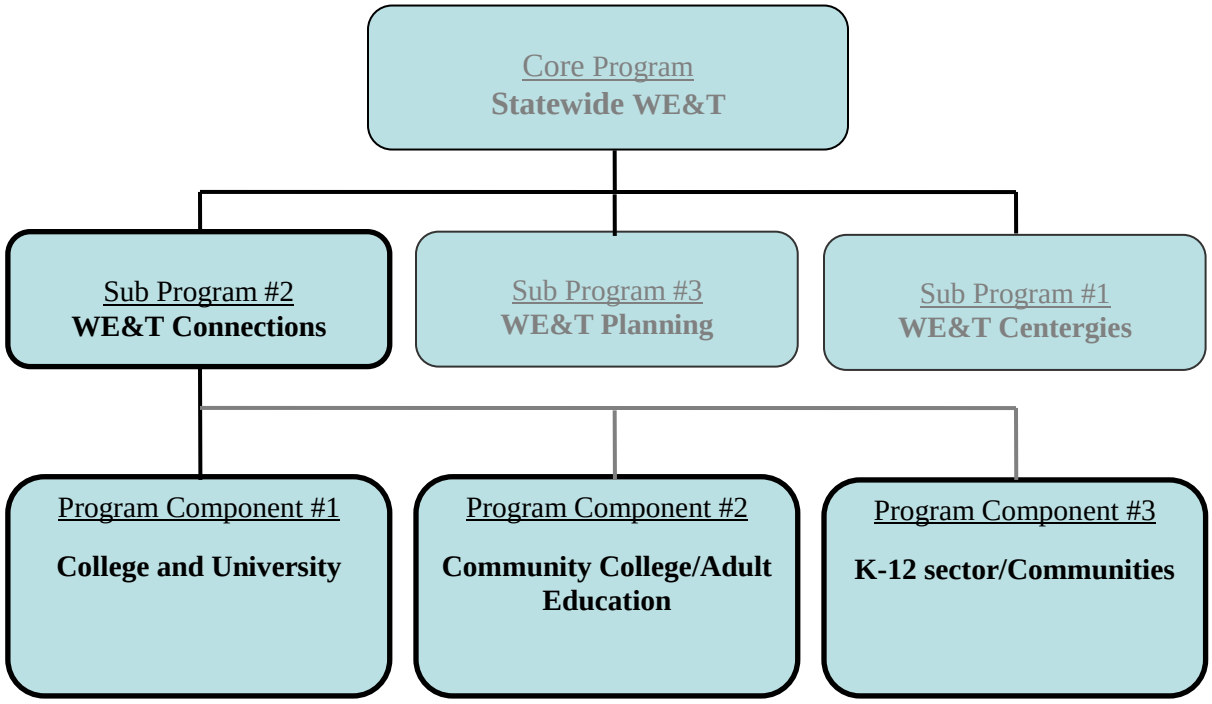
A third activity focus is to identify internal and external experts to conduct training and other services, while adhering to best practices in adult learning. The centers are developing and using many new training props to give students first-hand experience with how energy-saving technologies and practices work and how they produce savings. They are also including energy modeling tools to teach students to estimate savings resulting from the technologies and practices they learn in the classes. In addition, the centers are reviewing seminar content to be sure the adult learning principles are being incorporated.

A fourth activity in the logic model is the lending of tools to customers that will allow them to judge the energy efficiency of their equipment and make changes and adjustments to increase efficiency.

All of these activities are all expected to result in classes, consultations, promotional events, exhibits, and tool lending that increase participants' energy efficiency and IDSM knowledge and behaviors. Ultimately, these activities and outputs are expected to result in indirect energy savings.


2013-2014 WET Centergies Sub-Program - Logic Model
Activities
Outputs
Short Term Outcomes (2013-2014)
Intermediate Outcomes (More than One Program Cycle)
Long Term Outcomes (2020 & Beyond)
Collaborate with other CA energy centers, universities/colleges, & sector partners, with special attention to disadvantaged communities (B)
WET Centergies Strategy & Planning (A)
PPM-1, 2
Promote and market center services to target audiences (Mailing, trade shows, etc.) (C)
Identify internal/external experts to conduct training & implement sector strategies, other services, while adhering to best adult teaching & learning practices (D)
Obtain technology info for EE/Conservation/IDSM as system for C/I/A/R (E)
Lend tools to customers improve efficiency (F)
PPM-3
PPM-3
Completed workforce development and certification training classes (G)
Completed EC Seminars on-site and off site (H)
Completed Technical Consultations w/ wo Demo (I)
Completed energy center facility tours & other promotional events (J)
Updated exhibits, displays and brochures (K)
Record of tools loaned (L)
Improved EE/IDSM workforce-related skills (M)
Increased students and participants' EE/IDSM knowledge & Increased EE/IDSM behaviors at work & home, leading to attitude changes (O)
Increase in EE/IDSM employment & qualified labor pool (P)
Indirect Impact: Reduction in kW, kWh, or therm use, Environmental & Other non-energy benefits for home & work (Q)
Additional spillover indirect Impact: Reduction in kW, kWh, or therm use, Environmental & Other non-energy benefits for home & work (R)
Increased Penetration of EE/IDSM measures at market level (S)
Energy Code Changes (T)
Long-Term Reduction in kW, kWh, or therm use (U)
Advance Long-term California energy, environmental, and workforce policies (T)
*Individual IOUs' sub-programs may differ
AKA=awarness, knowledge, attitude

6.2) Sub-Program Implementation – WE&T Connections




4. Program Description

a) Describe program

WE&T Connections is a three-fold marketing, outreach and workforce education and training program. This Sub-Program offers K-12, Adult Education (post-high school), Technical Training, Community College and University level education programs that support the Strategic Plan's vision for educating and training California's workforce for "green" jobs.

- First, the programs promote green careers to K-12, Adult Education (post-high school), Technical Training, Community College and University students through energy and environmental curriculum, college credit courses at high schools, college degree programs, job shadowing and internships.

  The IOUs and/or our third party vendors will continue to work with California Department of Education (Curriculum Commission) as well as curriculum coordinators from the County Offices of Education to be included in curriculum development advisory boards so that we can contribute to tailored K-12 curriculum that includes the science of energy, energy efficiency, Demand Response, Renewable Resources and some discussion about green careers. We will also work with the California Community College Chancellor's office, UC Office of the President of Academic Affairs and the CSU Office of Degree Programs and Educational

Opportunities to 1) promote energy minor or major degree programs, 2) collaborate and/or provide expertise in the development of complementary new and revised courses that will form a comprehensive integrated approach to energy education, and 3) consult with campus-specific administrators to define additional courses needed to meet the growing need for graduates with skills in energy efficiency and related fields. Throughout the process, we will also work to incorporate and promote a green career path.

- Second, the programs are intended to educate students on energy, water, renewable energy, demand response, distributed generation as well as greenhouse gases and the environmental impact, with the goal of influencing day-to-day decisions of students and their households.
- Third, the programs educate K-12/Community Colleges/Universities on the benefits of adopting energy efficiency and demand response policies at their facilities to help them save energy and money. Having these programs at schools and campuses serves to reinforce that schools practice what they preach. Some students truly pay close attention to see if the schools are just providing lip service or if they are leading by example.

b) List measures

WE&T Connections program offers five energy education program components— Green Campus, DEEP, PEAK, Energenius, LivingWise, Green Pathways and Green Schools— and effectively integrates specific content for the science of energy, energy efficiency, water conservation, renewable energy, demand response, distributed generation, greenhouse gases to address awareness in the communities, barriers faced by schools as well as growth and demand for green careers. These programs are designed to be both flexible and affective across diverse learning environments as well as to empower K-12/college students to become advocates of smart energy management in their homes, schools, and communities. Each program component will also leverage all other available energy efficiency, demand response, and distributed generation programs for consumers as well as existing business incentives for schools, all to achieve immediate and long-term energy savings and demand reduction in homes, communities, schools and universities.

c) List non-incentive customer services

WE&T Connections is a non-incentive based, education and training sub-program.

5. Program Rationale and Expected Outcome

a) Quantitative Baseline and Market Transformation Information

See core program Section 5.a. for program performance metrics (PPMs) and Section 5.b. market transformation information.

b) Market Transformation Indicators (MTIs)

There were no market transformation indicators (MTIs) identified for the WE&T program.

c) Program Design to Overcome Barriers

Energy education is critical to assuring a stable and reliable supply of electricity in California. Educating students will create a new generation of Californians who understand the significance of energy in their lives, their role in its efficient use and the importance of managing our limited resources for the future. This knowledge and information can also lead to life-long energy savings habits and a concern for the environment and its limited resources for not only the students but, for their family and friends. This knowledge and education can also lead the interest in a future green career path. However, given the budget cuts at schools, cuts to curriculum and longer work hours for teachers, getting this message across may not be possible without the assistance of these IOU-sponsored programs.

WE&T Connections program components are designed to be both flexible and effective across diverse learning environments. All program components promote the science of energy, energy efficiency, demand response, distributed generation, and empower K-12 and college students to become advocates of smart energy management in their homes, schools, and communities. The program effectively combines classroom learning with hands-on activities.

The program will address lost opportunities in the school market by implementing a comprehensive, innovative approach that involves incorporating:

- Some of the nation's leading energy education programs. These programs are 1) designed to promote green careers through energy and environmental curriculum, 2) designed to educate students on energy, water, renewable energy, demand response, distributed generation as well as greenhouse gases and their impact to the environment, with the goal of influencing day-to-day decisions of students and their households, and 3) also designed to educate schools/facilities on the benefits of implementing energy efficiency policies and demand response programs at their sites to impact energy use in schools and, universities and to project energy and environmental leadership by example.
- The program components are developed in collaboration with natural gas, electricity and water agencies to promote and encourage the adoption of energy efficiency, demand response, distributed generation and water conservation options.
- Collaboration and integration with residential and business incentive programs that result in firm energy savings for homes and schools.

Energy costs for schools can be an enormous expense and are often the second largest expense for schools after employee salaries. Declines in school funding over the last 20 years have left little to no room in budgets for incorporating high performance measures during major repairs or renovation in existing buildings. This is where our business

incentives programs come into play when promoting these educational programs to schools. Not only are these educational components funded by the IOUs, but the schools can also see a measurable utility savings. Also, when the schools teach something that children can take home that helps parents save on their utility bills, the parents are more likely to be active in their students' education. Failure to take advantage of these educational and facility programs represents a significant missed opportunity.

The U.S. Department of Energy estimates that schools could save approximately 20% of their energy costs by incorporating energy efficiency measures[22]. To start, schools can begin with no cost behavioral and operational changes. Additional funds and/or incentives are needed before schools would seriously consider the more serious energy efficient options.

IOUs will continue to promote low-to-no-cost energy efficiency measures, as well as retrofits programs for their school facilities. In most cases, the benefit of the IOUs assisting school in ways to save on energy cost is the selling point to getting school district cooperation in implementing the educational components. Schools practicing what they teach with respect to energy efficiency, demand response, distributed generation and other helps reinforce the importance of practicing smart energy management with students, thus creating a new generation of energy smart citizens and potential future members of a green workforce.

The WE&T Connections program will address the needs of schools through a combination of student, teacher and school administrator education programs and increase their awareness and knowledge as well as provide curriculum and/or lesson plans that support these objectives. Also, once school-aged children learn something new like energy efficiency, they are great advocates for taking that knowledge home and teaching/motivating their parents and siblings to take actions to reduce energy and water consumption. University students can conduct valuable research and effectively educate their peers as well as campus administrators about energy efficiency:

- Students are effective advocates, able to reach their peers, communities and high-level decision makers in promoting green jobs on campus.
- Educational campaigns can result in significant energy savings on campus facilities and dorms by changing behaviors and purchasing decisions.
- The IOUs and/or our third-party vendors will develop curriculum and lesson plans for K-12 as well as work with the appropriate community college and university agencies responsible for, college courses and programs needed to educate students about energy, energy efficiency and prepare them for a green career path.

Addressing the interaction between energy and water use is essential, as well as the link between energy conservation and the reduction in greenhouse gases. Water conservation lowers energy use and energy bills; particularly, when energy used to heat water can be reduced and energy conservation reduces emission and global warming. The utilities and

[22] Per DOE website. [http://www.eere.energy.gov/buildings/info/schools/] [http://eere.energy.gov/buildings/energysmartschools/howto_operating.html]

water agencies will extend the reach of their programs and services and promote integrated solutions.

The primary goal of the program is to educate and create awareness among K-12 and college students about the importance of energy and water efficiency and how to apply at home and in their communities what is learned at school and to promote green careers to K-12 and college students to meet California's need for green jobs, A secondary goal of the program is to improve public education facilities and inform facility operators and administrators about the benefits of energy efficient equipment and operation practices.

The basis of the program theory is that increased awareness will result in increased levels of energy and water efficiency in communities and at home where energy conservation starts, and increase conservation efforts at schools and universities. The combination of education and environmental awareness at schools and campuses are expected to motivate students not only to change their energy use behavior, but also to provide them with another very real and worthy option for a career path.

d) Program Targets

The proposed targets may be modified due to funding restrictions.

**Table 5**

| Program Name | Program Target 2013 | Program Target 2014 |
|---|---|---|
| **University Sector** | | |
| Green Campus (Statewide) | 16 campuses | 16 campuses |
| **Community College Sector** | | |
| DEEP (SCE only) | 3 campuses | 3 campuses |
| **K-12 Sector** | | |
| PEAK (Statewide) | 20,000 students | 20,000 students |
| Energenius (PG&E) | 60,000 students | 60,000 students |
| Green Pathways* (PG&E) | 1,000 Online Course/Community Participants | 1,000 Online Course/Community Participants |
| LivingWise (SCG, SCE) | 30,000 students | 30,000 students |
| Green Schools (SCE) | 25,000 students | 25,000 students |
| **Note:** There are approximately 6,000,000 K-12 students currently enrolled in California, and our K-12 programs are expected to touch only 7% of the student population over the next 2 years. However, the programs at these schools will serve as a test/pilot environment for energy efficiency and green career curriculum.<br>* Green Pathways serves grades 9-12; goals will be determined upon approval of final budget. | | |

e) Advancing Strategic Plan goals and objectives

See core program PIP.

6. Program Implementation

a) Statewide IOU Coordination

i. Program delivery mechanisms

WE&T Connections programs will be taking a sector strategy approach around education collaborations with K-12 and College stakeholders and organizations. The strategy's multi-faceted goals include increasing engagement of all students, particularly minority, low-income or disadvantaged, in energy-related coursework and programs, poising them for careers in Energy Efficiency (EE) and a life-long appreciation of energy conservation and efficiency.

The California Public Utilities Commission has provided a framework to make EE a way of life in California by refocusing rate-payer funded EE programs on achieving long-term savings. Goals of this framework include (1) establishing EE education and training at all levels of California's educational systems; and, (2) ensuring that minority low-income and disadvantaged communities fully participate in training and education programs at all levels of the Demand Side Management and EE industry.

Education collaborations are integral to achieving the goals laid out above. The K-12 and College Sector Strategy, led by the IOUs and implemented by a cross-stakeholder driven partnership, will include the below key elements to ensure these goals are achieved.

While traditional sector strategies often include specific employer hiring commitment or funding, the K-12 Sector Strategy will not directly include this component due to the target population being years away from career entry points. However, other sector strategy hallmarks will be included in this approach. These include:

- Developing a regional partnership which includes a cross-section of stakeholders from the EE sector.
- Ensuring employer commitment to help align training to market demand.
- Working towards career pathway development, including "stackable" credentials that enable students' education to build upon previous trainings.

Ultimately, via the Sector Strategy work, the IOUs will have a thorough understanding of K-12 and College resources and programs that currently exist, and, ***through collaborations***, (1) propose enhancements to current programs, (2) identify new program needs that fill gaps understood from our mapping work, and (3) create opportunities to "link" programs and build education pathways. The ultimate goal is to increase the engagement of students in energy-related K-12 programs, and ultimately, energy efficiency careers.

**Key Elements**

- Supporting K-12 and college efforts to assist students to develop education based on visible career paths in EE and related fields.
- Creating and/or expanding college and university programs with EE focus.
- Fostering green campus efforts to apply EE knowledge in clear view of students and faculty.
- Continued refinement of existing curriculum to ensure EE fundamentals are included.
- Identifying career options in energy-related fields.
- Continue incorporating career exploration into programs and developing a systematic effort to institutionalize energy awareness and career awareness programs that is aligned with state content standards.
- Expanding collaborations with career academies, regional occupational programs and community colleges.

**Proposed Objectives**

- Students develop an awareness and appreciation for energy, energy conservation and the impact to the environment;
- Students develop careers that advance DSM business, policy, research and development and education; and
- Individuals from the targeted communities take advantage of programs that specialize in energy disciplines at all levels of the educational system and successfully advance themselves into rewarding careers in the energy services fields.
- Linking existing training programs, across modalities, so that students' options are increased and pathways begin to be developed, e.g., pathways to post-secondary programs.
- Increase engagement of at-risk or disadvantaged students in energy-related coursework.
- A plan for more fully leveraging utility training centers for K-12 stakeholders.

**College and University sector**

**Green Campus (statewide)**

The Green Campus Program is implemented on college and university campuses by student interns engaged and/or enrolled in environmental studies and/or other related areas. This team of 2 – 6 student interns per campus engages other students through forums, and other means on the importance of energy conservation and the link to the environment. They also lead the way in addressing energy efficiency in the higher education sector by meeting with faculty, staff and administrators and work with them to incorporate energy,

energy efficiency and discussions about a green career path into their courses/programs as well as work with campus officials to implement energy efficiency projects on campus and add value with educational outreach campaigns. Green Campus addresses behavioral and operational changes and product retrofits for campus facilities as well as serves as a direct pipeline of emerging environmental/energy professionals.

Green Campus WE&T aspects are exemplified by the advanced technical and professional development skills that the students develop as part of their internship, and that non-intern students develop from interaction with Green Campus interns. Green Campus projects include dorm energy competitions, energy efficiency curricula development, building energy assessments and recommendations, technology pilots, and outreach events. Interns actively market their projects and the program by completing monthly newsletters, working with campus and local media and presenting at conferences – including biannual program convergences.

Green Campus Program is being reviewed to determine if it qualifies as a resource program.

Program Delivery
Student Intern assistance to Facility Management stakeholders; Housing and Dining; and energy service companies (ESCOs), as appropriate, to help them increase measurable energy savings: Green Campus Interns play a key role in helping campus staff, administrators and energy efficiency professionals with their energy savings targets. As a means to this end, students will organize such activities as dorm energy competitions, laboratory fume hood educational campaigns and competitions, technology pilots, office energy assessments and recommendations.

- *Recruit, train and support Green Campus Interns at each campus in implementing program activities.* Interns are hired and trained to implement many aspects of the program throughout the school year. Green Campus program staff works closely with interns, campus stakeholders, utility partners and ESCOs as they identify their objectives and draft a detailed implementation plan.
- Hold a fall planning meeting with student organizers and IOU program managers, campus administrators, facilities staff, faculty, IOU program managers and, energy service company representatives at each campus. After conducting implementation planning exercises prior to or early in the fall term, Green Campus Interns will bring new participants up to speed on the program goals, expectations, report on activities conducted to date, unveil future plans, and solicit feed-back.
- *Building in Efficiency to the Fabric of the Academic Framework:* Program staff will work with the UC Office of the President, Office of Academic

Affairs, CSU Office of Degree Programs and Educational Opportunities, or Office of the Chancellor to:

- develop a database of EE-related courses on UC and CSU campuses,
- consult with system-level as well as campus-specific administrators to define additional courses needed to meet the growing need for graduates with skills in energy efficiency and related fields, and

- Utilize the Green Campus program as a tools to promote energy, sustainability, environmental and other related courses on campus
- *Ramping Up Green Campus Reach:* Every aspect of the Green Campus Program offers a pathway to green jobs –academic course offerings, training in technical and "soft" professional skills, experiential hands-on energy efficiency projects, and providing a statewide network composed of utilities professionals, other professionals and academics, students, and program alumni. We plan to increase the number of students who participate in Green Campus activities through growing the "concentric circles" of GC activities:
  - Students who are employed as GC interns (approximately 60 students)
  - Increase the number of volunteers who participate in GC activities without being paid
  - Interns conducting awareness campaigns on campus will invite students to sign up as honorary Green Campus students and pledge to advance the WE&T message across campus. They will carry the message forward and ask others to do the same. Interns will gather pledge information so that they can be contact via email to gather information on courses they are taking or jobs they might be in.
  - Increase the number of students who take classes taught or facilitated by GC interns (currently over 600 per year total)
  - Students who are exposed to Green Campus messages on campus (This is already 400,000 student contacts per year statewide)
- *Ensure that minority, low income and disadvantaged communities fully participate in training and education programs.* Green Campus program will be made available at campuses serving low-income, minority and disadvantaged communities.
- *Mid-year and year-end meetings of all Green Campuses.* The mid-year meetings bring interns together with IOU program managers, campus administrators, faculty, and facilities staff from various campuses to share successes, discuss challenges, and plan Green Campus activities for the next half of the academic year. The year-end meetings are used to review the year's progress, recognize group and individual accomplishments or best practices, and plan for the summer and following year.
- *Coordinate with other IOU departments to promote consumer and business incentive programs.* Green Campus through IOU Account Executives will

provide information to campus administrators and facilities managers about Business Incentive Programs and encourage them to take advantage of these opportunities for making energy efficiency changes more cost effective. These facilities energy savings projects are needed for two things1) for students to see that campuses are practicing what they are teaching, and 2) to serve as a lab for students to practice energy efficiency through identification and implementation of projects on campuses, and 3) building a career pathway.

**Community College sector**

**CCC IOU Partnership**

The 2013-2014 California Community College program will build upon, enhance, and streamline the implementation strategies employed in the 2010-2012 partnership and adopt new strategies over the life of the program as they emerge or are proven as ready for the market. The implementation plan will be refined to adopt best practices and lessons learned program elements for the 2013-2014 programs will include:

- An improved program management and structure that adopts lessons learned from the past cycle resulting in a more streamlined, effective approach;
- In the process of expanding the existing CCC training and education program from simply training facilities, operations and maintenance staff to include working with community stakeholders on curriculum development for students and industry with the objective of developing future energy professionals and a green workforce. Please refer to Advancing Strategic Plan goals and objectives for details on IOUs role in developing a Utility Workforce Education and Training program as well as our plan to ensure low income, minority and disadvantaged students are included.

**DEEP (SCE only)**

DEEP is an employment development program that trains and educates California Community College students in the areas of integrated demand side reduction through classroom learning, projects, and outreach within the campus community. Along with preparing students for green careers, the program will produce reductions in operational costs for California Community Colleges by promoting the understanding of demand response, resource conservation, and carbon emission reduction.

**Three Program Goals**

Promote Sustainability and Efficiency Awareness

DEEP students will learn about sustainable lifestyles and promote what they have learned.

DEEP students will be guided by program coordinators, faculty and administrative staff on campus. They will familiarize themselves with current on-campus practices

in building construction, recycling, green procure-ment, and renewable energy. They will work to integrate new concepts of sustainability into existing classes. DEEP students will provide the link between cam-pus sustainability, academic infusion of sustainability concepts, and the green workforce.

Engage Students with Hands on Learning & Pro-mote Peer-to-Peer Learning Opportunities

DEEP students will work closely with stakeholders and organizations on campus to create and implement energy efficiency projects, and conduct outreach campaigns. These guided efforts will work toward providing students with a hands-on experience, bring the campus realized energy saving opportunities, enhance building performance, and provide multiple other benefits.

Provide Green Workforce Exposure and Real World Experience

DEEP students will have opportunities to be exposed to domestic and international companies. They will develop relationships to future careers via interactions with companies such as Chevron Energy Solutions, ACCO Engineered Systems, Powersmiths, Lime Energy, Sie-men's Industry Inc, Sunflower, Growing Energy Labs, Honeywell Building Solutions, and Growing Energy Labs.

Students will be exposed to the benefits of transferring to four year colleges and learn how their educational interests relate to professional careers in energy.

**Program Approach**

The DEEP Program is primarily student-driven and al-lows valuable innovators to take an active role in driving Community College campuses to meet the needs of the developing green economy.

An effective Peer-to-Peer teaching model is encouraged. This allows students to teach others about energy and exponentially increases campus-wide energy awareness.

The recruitment, screening, and participant selection will be facilitated in close collaboration with participating campuses and the Foundation for California Com-munity Colleges. All employee relation issues will be managed by the Foundation's Human Resources Department utilizing the SAGE system. Each selected school will receive funding for forty hours per week to be distributed among four to six part-time DEEP students. Positions will be allocated $10 per hour for an average of approximately 10 hours per week for the duration of program participation.

Student participants will work collaboratively with key stakeholders to create campus-wide goals and create a customized list of strategies to achieve those goals. Each team will assign roles and responsibilities to respective members.

**Adult School/Post High School (SCE)**

The delivery mechanisms include in-language seminars, outreach to schools, community events, faith-based organizations and Workforce, Education & Training.

- In-language seminars: The objective of in-language seminars will be to provide a classroom style forum to empower residential customers to conserve resources by teaching them simple ways of saving electricity, gas and water. This strategy will also align itself with a goal of the WE&T Strategic Plan so that minority, low-income and disadvantaged communities fully participate in education programs by providing elements that will seek to encourage interest toward careers in the energy efficiency industry. Seminars will also be used to promote other IOU program offerings such as Comprehensive Home Performance and of course demand response and other integrated DSM offerings like Summer Discount.
- Community booths: CLEO will continue participating in prominent ethnic cultural booths such as the 'Chinese New Year' and 'Harvest Moon Festivals'. This will also include coordinating with SCE's and SCG's Energy Centers and faith-based organizations and other cultural opportunities.
- Schools outreach: In 2013-2014, the CLEO program will expand its schools outreach efforts by providing a comprehensive schools initiative. In addition to continuing the 'Energy-Artist' contest, this initiative will also introduce a 'Carbon Footprint' contest where schools could potentially compete against each other for the highest decrease in energy use. The PEAK Program will be utilized to encourage energy efficiency behavior for fourth graders. Outreach efforts will also include coordination with SCE's Mobile Energy Unit and will also target Adult Education centers. Primary focus will involve K-12 elementary schools.
- Faith-Based Organizations (FBO's) and Community Center outreach: Local community FBO's and religious forums form the backbone of the ethnic community. FBO's also provide a forum for community events and an excellent platform to market and encourage energy efficiency. CLEO will cultivate and add to the existing relationships with churches and local community centers to effectively cultivate program participation and promote energy conservation
- Community / city partnership and outreach: This outreach strategy will build upon existing relationships with the cities of Monterey Park, San Gabriel, Alhambra, Walnut, Diamond Bar and others to promote energy efficiency in the community. CLEO will place information kiosks at city community centers and will participate in community events to further promote energy efficiency in the community. CLEO will also integrate components of the program with other existing partnership programs with higher ethnic populations.
- Workforce, Education and Training: CLEO will expand its reach in the Workforce, Education and Training (WE&T) area by providing in-language energy efficiency education and training at various Adult Learning Centers and Community Colleges. The focus will be on educating those whose primary language is not English. Program participants will learn about the green jobs industry, energy efficiency measures / technologies, programs and services offered, as well as be placed on a 'green' career-path for participants to build upon.

## K-12 sector

Some of these programs target the same grade levels but, none of the current or proposed programs target the same districts/schools. We have and will continue to ensure that students participating in one program will not also participate in another similar IOU provided program.

### PEAK (statewide)

For 2013-2014, PEAK is proposed as a continuation of a successful program by PG&E, SDG&E, SCG and SCE. The participating IOUs will continue to work together to ensure that the program design and delivery is consistent across the IOUs.. Other changes planned for 2013-2014 are revisions to include lessons on Water/Energy Nexus to reflect WE&T goals.

#### Brief description of the program.

PEAK Student Energy Actions (PEAK) is a standards-based energy education program for grades 3rd through 7th grade (with possible expansion into other grades), that empowers youth to save energy in their homes, schools, and communities and promotes workforce development in energy-related industries.

#### Program Key Elements

The core of this program is built on four PEAK Student Energy Actions which are used thematically to educate students on how their personal behavior and the behavior of others has a direct impact on the demand for energy and on the environment. The four PEAK Student Energy Actions are: 1) Shifting Use Off Peak Demand Times 2) Cutting Waste Through Conservation 3) Plugging Into New and Efficient Technologies 4) Exploring Renewable Energy
Overall Program Goals:

- Deliver high-quality energy education to the next generation of energy consumers.
- Actively engage students, their families, and schools to save energy through energy efficiency, smart resource management, sustainability and demand response awareness.
- Provide career awareness, career exploration, and/or career preparation to appropriate grades on industries related to energy and environmental sectors.
- Create sustainable behavioral changes that result in the achievement of immediate and long-term energy savings and demand reduction in schools and homes.
- Promote positive relationships between the end user, the community, and their serving utility.

#### Program Rationale

PEAK complements each level of the Integrated Demand Side Management model by using education as a means of shifting behavior. The Energy Coalition's PEAK program will support IOUs in meeting recommendations outlined in the California Long Term Energy Efficiency Strategic Plan (CLEESP) and Workforce Education

and Training (WE&T) Needs Assessment by providing integrated education on demand response, energy efficiency, energy and water conservation and sustainability through its curriculum. Participating students will receive workforce education related to career awareness, career exploration, and career preparation in order to ensure that they are equipped with the necessary pathway to enter the workforce. PEAK also promotes various rebate and incentive programs such as the Home Energy Efficiency Survey.

**Alignment with CLTEESP**

PEAK is aligned with the following CLTEESP Workforce Education and Training goals: 1) Establish energy efficiency education and training at all levels of California's educational system 2) Ensure the minority, low-income and disadvantaged communities fully participate. The PEAK program supports the state in meeting its 2020 goal to have a workforce that is trained and fully prepared to achieve California's economic energy efficiency and demand-side management workforce potential.

**Core Program Coordination**

The PEAK program fits with the current IOU WE&T programs in that PEAK both provides and continuously develops 3 – 7 grade curriculum to include energy efficiency fundamentals (e.g. math, science, behavior) and identify career pathway options in energy-related fields. In addition, PEAK supports existing IOU programs by funneling participating student families into energy efficiency programs including distribution of IDSM education through student take-home materials. The Energy Coalition will work with the utility to further connect additional utility rebate and incentive opportunities that support energy efficiency management at the school facility level.

**Target Audience**

PEAK is designed to engage students, educators, school district officials, school site administrators, parents, and community members. The PEAK program is tailored to educate 3rdthrough 12th grade students as change agents within the utility territory and develop educator expertise that supports the program core energy concepts as well as environmental education. In alignment with the CPUC's goals, PEAK will place emphasis on enrolling schools into the program that have been designated as low-income.

**Implementation Strategy**

Implementation strategy consists of the following components:

**Professional Development**

- Provide a Teacher Orientation & Training session for all new PEAK teachers. Offer advanced Teacher Training and Orientation to returning teachers.
- Support innovative project development in the areas of energy and the environment.

**PEAK On-site Support**

- Complete up to 2 PEAK educational campaigns or contests per school year.
- Conduct PEAK Events and Site Visits upon request or as deemed appropriate by PEAK and school staff.
- Provide on-site career explorer/career preparation opportunities upon request or as deemed appropriate by PEAK and school staff.

**PEAK Curriculum Development**

- Enhancements to improve relevance and comprehensiveness include: STEM and service learning-components, expansion to out of school time (OST), extension to 3rd -12th grade education, and expansion of components to include , Water-Energy Nexus, Smart Meters, renewable energy and other sustainability concepts.
- It is essential for PEAK to focus its efforts on career development especially in the areas of unemployed and underemployed workers. Two components will be developed: career exploration (grades 3-8) and career preparation (grades 9-12) if applicable. The Energy Coalition will realign the current curriculum so that students will explore the careers in the energy field as they engage in energy action activities, thus providing practice and engineering for success. For the career preparation component, The Energy Coalition will develop curriculum alongside the energy education to incorporate hands-on job preparation opportunities as the students prepare for the jobs of the future.

**Program Activities**

*Water/Energy Nexus module:* PEAK will create a new module/s to include Water/Energy Nexus and how the use of one impacts the use of the other.

*Classroom Lab Toolkit:* PEAK teachers receive a toolkit that contains the supplies needed to complete each hands-on lesson for a class of 36 students. Toolkit supplies are replenished on an as-needed basis.

*Energy Challenge Software:* PEAK's website at www.peakstudents.net houses interactive games that allow students to simulate the effects of energy efficient behaviors at home and in the community. The web page will be expanded to include new program features; renewable energy; demand response; greenhouse gases and, their environmental impact.

*Energy Education in the Community:* PEAK staff facilitates educational assemblies featuring Bulbman, PEAK's energy-saving mascot. Participants learn such concepts as how electricity is generated, how much energy is saved by a CFL, demand response, greenhouse gases and the 4 Student Energy Actions.

*Saving Energy at Schools Facility Audits:* Facility audits and retrofits will be offered to PEAK schools to improve facility energy use and enhance PEAK energy education. This initiative serves as an additional hands-on student learning opportunity, where students are encouraged to participate in the process and learn

about the impacts of proposed changes. Students are also more engaged in energy conservation when they see that the schools are also practicing what they teach. In fact, most districts have energy managers that manage the green effort at schools and, students are able to see a green career in action.

*Coordinate with other IOU departments to promote and facilitate Consumer and Business Incentive Programs.*

*Coordinate events with Mobile Energy Unit (MEU) where available:* PEAK program activities are tailored to suit the needs of PEAK participants. This customized approach is implemented in all PEAK activities including planning special events and product distributions, developing teacher trainings, promoting green jobs through career discussions, and organizing student field trips. PEAK's proactive support generates a feedback loop which lends itself to quality internal program monitoring and ensures a constantly evolving, living program. PEAK education ultimately produces behavior modifications and attitudinal shifts that result in immediate measurable kW, kWh and therm reductions in both the student's school and home.

PEAK complements each level of the Integrated Demand Side Management model by using education as a means of shifting behavior. PEAK's comprehensive, hands-on program is correlated to the State of California's science, math and language arts standards for grades three through seven. The program teaches students the science of energy and instills an ethic of smart energy management as well as engages students on discussions about green jobs. Throughout their participation in the PEAK program, students are presented with the necessary tools to formulate thoughtful conclusions about energy usage at the individual and community levels.

**Energenius Pre-K to 8 Program (PG&E only)**

The Energenius Program, in 21 years of existence, has reached close to one million students in both public and private schools within the PG&E service area. These highly rated educational materials are designed for students from pre-kindergarten through middle school. They are correlated to California Department of Education Content Standards and are reviewed and/or piloted during the development process by classroom teachers. Each of the eight existing Energenius programs include curriculum guides with detailed lesson plans, student activity books, calendars (for primary grades), and take home materials on energy efficiency for parents and guardians.

The WE&T goals of the California Long Term Energy Efficiency Strategic Plan (CLTEESP) are reflected in the content and in the marketing strategies of the Energenius program. Section 9.5 of the Strategic Plan stresses that curriculum should include energy efficiency fundamentals and identify career options in energy related fields. All programs are in the process or have incorporated these concepts. The Energenius program, in meeting goal 2 has implemented a comprehensive marketing plan to ensure that minority, low income and disadvantaged communities fully participate in its program.

The eight programs that are presently being marketed include: We Saved Energy Today – pre-kindergarten; Energenius Big Book Program for kindergarten – grade 1; Energy and Me! for grades 2-3; Energenius E Program for grades 4-5; Trees. Energy, and the Environment for grades 4–6, Energy Check-Up for the Environment for grades 4- 6; Water, Energy and the Environment for grades 4 – 6; and Transportation, Energy, and the Environment for grades 6 and above. Grade level designations relate to how each program is correlated to California Content Standards. However, teachers are the ones to decide which materials best meet the needs and skill levels of their own students.

The main focus of all the Energenius programs is on energy efficiency. As age appropriate content is included on the science of energy, environmental impacts of energy use and energy production, the water=energy nexus, greenhouse gas emissions, global climate change, demand response, and distributed generation. Content is also included on careers and jobs (awareness and exploration) with an emphasis on those in the green and clean-tech areas.

Learning about energy, energy efficiency, and the environment should begin at an early age and continue through elementary, middle and high school, and beyond. The knowledge, information and skills can lead to lifelong habits and concern for the environment and the protection of the Earths' limited natural resources. Students are also discovering in the Energenius program materials information (as age appropriate) on green jobs and careers.

*Launching of Energenius Programs and Resource Guides*

Two new Energenius Programs for middle school students will be available by end of 2012 and marketed beginning in 2013. A unit on non-renewable and renewable energy sources offers students an introduction to various sources of energy. Research and in-class activities provide the background for students to analyze the costs and benefits of various energy sources. Students will also analyze the environmental impacts of the energy sources and learn how their own daily energy choices impact the environment. A section of the program relates to jobs and careers in renewable energy fields. The other new Energenius program is Smart Technology, Energy, and the Environment. This unit focuses on the smart grid, smart meters, and how technology allows consumers to better manage their energy consumption. Content related to demand-response and distributed generation is introduced along with a look to a future where many consumers of energy will also be producers of energy. Careers related to the development /installation of the smart grid are among those covered in this unit.

*Green Career Resource Guide*

The new Energenius Green Career Resource Guide provides high school counselors and other educators a listing of resources they can use with students who are interested in learning about careers and jobs in the green economy. A range of annotated websites along with a section on search techniques will

help introduce students to training and educational opportunities to secure green careers and jobs in the future.

*Online Energy Resources for Educators*

The Online Energy Resources for Educators guide has been updated and is available both online and in a print version. This annotated guide provides educators a hundred plus web resources for teaching about energy and the environment.

*Revising of Energenius Educational Program*

Two of the Energenius programs will be updated and revised in 2013 to be in compliance with expanded content defined in the CLTEESP and the Needs Assessment. Both programs will also provide activities related to career awareness with an emphasis on green careers in energy related fields. The Light Right Program for grades 4-6 uses lighting as a way to explore energy, technological changes and personal energy habits. As students take actions at school and home to be energy efficient they learn how they are also reducing greenhouse emissions that contribute to global climate change. The Energenius E Program (grades 4 –5) developed in 2005 will be updated to include information on how the use of electricity and natural gas is measured. Students will learn in this unit about the greenhouse effect, greenhouse gas emissions and global climate change. Included in this E Program will be content on how energy production and energy use impacts the environment.

*Green Action Teams*

A new green Energenius program will bring resources to high schools wanting to implement green action teams. Resources include consultation services by a green team implementation specialist. A consultant will provide site visits, phone consultations, and green team planning sessions. The consultant will work closely with staff and students to define activities and facilitate the actual establishment of a green team. One of the early team activities will be an energy survey of the school to help establish potential links to retrofit incentive programs. Upon a review of the survey results an energy expert will analyze potential energy savings at the site and make recommendations to the school and school district. Once a plan is developed other resources can be brought in by the utility. Green action team members might also choose to implement a water-saving program, a green career day, or introduce a new composting/recycling program. An additional activity for high school green team members would be to partner with local middle schools to help them establish their own teams.

**Green Pathways High School (9 – 12 grade) program (PG&E only)**

For 2013-2014, Green Pathways will be a local PG&E program. Green Pathways is a green workforce development high school program. The program was approved and developed during 2010-2012. (Filed Advice letter #3080-G/3596-E.) The pilot included research, development, and testing in collaboration with student and adult stakeholder groups. The goal of the pilot—to determine proof-of-concept for a program that addresses unmet market needs and regulatory requirements—was accomplished. Green Pathways is now positioned to serve students and communities

in the PG&E service area in 2013-2014 with the potential to reach students and communities statewide thereafter.

Green Pathways is the only targeted high school Connections program that leverages the online environment and social networking trends in education, utilizing online learning and communication. The Green Pathways online course completes the K-college level program continuity in energy efficiency education and career preparation. The online community engages professionals in the green workforce to inform and inspire students to pursue green careers. By leveraging the reach, economy, and scale inherent in online resources, Green Pathways provides a strategy that introduces California's emerging high school–college workforce to opportunities to contribute creatively and productively to California's environmental sustainability solutions.

The WE&T goals of the California Long Term Energy Efficiency Strategic Plan (CLTEESP) and the 2012 Needs Assessment Recommendations are reflected in the goals, content, and marketing strategies of Green Pathways. Section 9.5 of the Strategic Plan stresses that curriculum should include energy efficiency fundamentals and identify career options in energy related fields. These concepts are integrated into the Green Pathways online course and community. Green Pathways also provides pivotal gateway information and experiences to prepare high school students to identify and secure future internships and work opportunities. The online community will represent our cross-sector partners from industry, trade and professional organizations, educational institutions, and local and state agencies. It will engage multiple stakeholder groups representing diverse market sectors such as business, industry, government, and CBOs. Green Pathways will be made available to geographically and socio-economically diverse communities within the PG&E service area. In meeting Goal 2 of the Strategic Plan, Green Pathways has already implemented a marketing plan to ensure that minority, low income, and disadvantaged communities have full access to the program.
Green Pathways includes four key elements: an online course, a web-based learning community, volunteer green professionals (Green Gurus), and teacher professional development. These components provide students with a unique workforce development resource that integrates career preparation with environmental sustainability and green employment. It also provides teachers with a relevant, real world, green curricular context that enhances their curriculum. It seeks to increase students' awareness and involvement in their community about local environmental challenges, strategies and solutions, and related career opportunities.

O*nline Course*
The Green Pathways course provides a flexible vehicle for use by educational institutions, CBOs, and independent and home school students. Delivery options could involve one consolidated period of time or span a few weeks or semester. The multi-week course complements teacher's curriculum and can be used in conjunction with a variety of high school courses. It can also be integrated into after school programs, clubs, or CBOs' youth programs. Green Pathways equips students

with the knowledge, skills, and resources to begin a path toward green careers. Course content is divided into modules that include Environmental Sustainability Challenges, green careers addressing those challenges, and career exploration/preparation strategies. Online tools and resources include career assessments, the Department of Labor's jobs database, video/media, and discussions with Green Gurus and Career Coaches. Course completion includes certificates of completion and possible course credit options.

*Online Community*
The online learning community is a communication and collaboration hub to achieve dual goals of (1) providing environmental sustainability content and (2) catalyzing resource sharing across regions, market sectors, and organizations. Students and teachers build relationships with peers from other school districts and communities that otherwise would not be possible. It hosts Green Gurus and Career Coaches in a variety of interactive formats including blogs, Q&A, discussions, and webinars. These experts offer information and guidance and serve as a source of networking contacts, potential internships, and possible work opportunities. Students create a personal profile that showcases their green career interests, work and volunteer experience, and desired pathway. As members of the Green Pathways community, students may participate in community activities as they build their path toward a green career.

*Professional Development*
Professional development ensures the successful delivery of Green Pathways by educators and program directors. For many, an online course and communication platform may be new. Leader preparation introduces the knowledge and skills needed for orchestrating a successful online learning experience. Instructional materials and web-based training sessions will be provided. Ongoing interaction among participating leaders will encourage learning from each other and support a successful implementation.

*Collaboration and Community Building*
In the service of developing tomorrow's green workforce today, Green Pathways creates motivation and a vehicle for cross-sector collaboration, community building, and communication. Green Pathways is positioned to link and leverage its resources and those of our partners and related initiatives such as the IOU Connections, Centergies programs, and the Green Pathways Sector Strategy. The program will reach out to Workforce Investment Boards, representatives of local and state agencies, professional and trade organizations, unions, and providers of apprenticeships and training programs. These partner resources—along with community college, four-year, and graduate programs—will provide relevant job, preparation, training, and internship information to Green Pathways students and teachers locally and regionally.

**LivingWise (SCG and SCE)**

For 2013-2014 , LivingWise® is proposed as a continuation of a successful program partnership between SCE and SCG. LivingWise® program target 5th and 6th grade students, and is usually incorporated into the science and math classes over a 4 week period. Local water providers are also contacted regarding their interest to co-sponsor the LivingWise® Program in their service territories. LivingWise® provides classroom learning activities and take-home kits to elementary and middle school classes. The kit contains energy and water-saving products such as a compact fluorescent lamp and high efficiency showerhead as well as other items to introduce energy efficiency and water conservation to children and their parents. The program features a blend of classroom learning activities, hands-on energy survey and installation projects which students complete in their homes with parental assistance. In addition, LivingWise® participants will be provided lesson plans as well as classroom discussion in the area of energy efficiency, demand response, distributed generation, water conservation and careers and job opportunities in the new green economy. These lesson plans come in the form of an activity booklet that addresses electric, gas and water conservation as well as greenhouse gases, renewable energy and careers in green jobs.

**Program Activities**

**Interactive**: Interactive school-to-home program for students

**LivingWise® Activity book**: The LivingWise Teacher Activity Guide enables teachers to meet academic content standards in science, math, and environmental. Lessons are designed to be fully comprehensive and contain the following: student learning objectives, post-activity reflection and environmental impacts.

The activity books contain the following lessons:

- Electricity;
- Natural gas;
- Water conservation;
- Renewable energy;
- Distributed generation;
- Greenhouse gases;
- Demand response; and
- Careers in the new green economy.

**Classroom activity**: Teacher-designed classroom activities that reinforce student work on critical State Standards for core subject areas (math, Science, environmental).

**Hands-on**: Hands-on projects that utilize kits containing energy and water efficiency technologies that students directly install in their homes, thus reinforcing education results.

**Family involvement**: Involvement of parents to shape family habits and awareness of the benefits of energy and water efficiency

**Fully integrated energy efficiency program**: Collaboration with Southern California Gas Co and local Water agencies ensures that program covers electric, gas, and water as well as greenhouse gases, renewable energy and careers in green jobs.

**Coordinate with internal departments to promote and facilitate Consumer and Business Incentive Programs**.

Teachers are required to incorporate lessons from each of the following areas; electricity, natural gas, renewable resources, GHG and green jobs into their math, science or environmental classroom activities as possible. This program is very adaptable to different teaching styles and compliments California's science and math curriculum.

Initial implementation includes program customization to promote utility energy efficiency programs, demand response, distributed generation, water conservation as well as a green career path. The program also features a) pre-survey – that kids complete at the start of the program to determine their knowledge of energy efficiency, b) Household report card – that provide valuable information about household environment and conservation behaviors, c) post-survey – the kids complete after going through the program and allows us to see program effects on their knowledge.

**Green Schools (SCE)**

Green Schools is a comprehensive K-12 school program that integrates energy saving actions into schools, homes, and the community as well as provides skills development to high school students in preparation for green jobs. Program staff meet with school district representatives, principals and teachers to develop a customized approach for their schools. Teachers are then trained on its lesson plans and approach. The program's Instructional resource materials, including lessons in all aspects of energy and energy efficiency, are correlated to California education standards, making it easier for teachers to integrate the lessons into their curriculum and strengthen student academic learning. For 2013-2014, the program will expand in the area of green career awareness and career exploration as outlined in the California Needs Assessment, where teachers will talk to students about careers in solar, wind, hydro, energy management as well as environmental areas. Our goal is that students will learn and consider energy careers in high school much like they previously learned about going into the medical field, legal field, accounting and public service.

Green Schools teaches students about energy from an integrated perspective that includes the science of energy, energy efficiency and conservation, demand response, renewable and distributed generation, environmental and economic impacts of energy consumption and encourages students to consider green careers. Students will learn

about green careers or green university courses/programs in their life skills classes and/or from their career counselors. The students will use the campus as a laboratory for hands-on learning. As a result, the students will drive behavioral changes, operational changes, and product retrofits to 1) save energy and reduce utility costs, and 2) for students to see that schools are practicing what they are teaching. Teams of teachers, custodians, administrators, and students work together to develop a tailored plan that implements all aspects of this program at their schools. Through integrative, project-based learning activities, the Green Schools teams work with students who then become energy-smart educators and efficiency advocates, bringing the conservation message and knowledge about green careers to their schools, homes, and communities. Students learn about energy, ways energy efficiency can help the environment, rewarding careers in the energy field, and will involve their schools and families in energy lessons and energy efficiency practices.

The Green Schools Program provides training and professional development to teachers, custodians, and administrators; trains students to conduct audits of their schools; educates students about career opportunities in the energy efficiency field; and convenes school teams three times during the year to learn how to implement the program, celebrate successes and learn from their challenges. The career knowledge and experience that students gain with respect to energy and energy conservation prepares students for a wide range of rewarding energy careers in the government sector, public sector, CBOs and utilities.

*Program Activities*
*Conduct Professional Development Workshop for new school teams*: Program staff will conduct a one-day Professional Development Workshop in the summer or fall of each year to train new school teams of superintendents, principals, teachers and career counselors about the program goals and provide instruction and guidance in planning and implementing their Green Schools activities.

*Curriculum Development:* Will work with California Department of Education (Curriculum Commission) to be included in curriculum development advisory boards so that the Energy sector can contribute to tailored K-12 curriculum and enhance the state-mandated Environmental Education Initiative with more robust energy efficiency curriculum. Develop a complete lesson plan library for teachers to select from to integrate with their teaching.

*Instructional Resource Binders:* These binders are provided and discussed at the professional development workshop. The resource binders contain the following sections:

- Teaching about energy
- Alternative energy sources (New)
- Green careers (New)
- Saving energy at school
- Involving the whole school

- Saving energy at home
- Facilities and custodial staff contributions to Green Schools

Teachers are required to cover 1) Section 1: background lessons, action lessons, and climate change, 2) Section 4: saving energy at home and at the community, 3) Section on Alternative energy sources: solar, wind, distributed generation and demand response, 4) Section on Green careers.

*Promote energy efficiency measures in the community:* Each year students will be engaged in activities that promote community outreach and SCE's incentives information. Examples of community outreach activities include tabling at school or community events, student presentations on energy efficiency for community service organizations, and students working with parents to complete SCE's home energy efficiency survey. These activities serve to instill this green lifestyle in the students. If the student is passionate about this cause, s/he will be more likely to continue this course in college and or a green career. This function should serve as preparation for this student following a green career path.

*Student Energy Audit Training (SEAT):* Conduct SEAT program in three high schools and/or middle schools each year. The Green Schools SEAT program educates students about energy and gives them first-hand experience analyzing how energy is used at their school. Students will learn about many aspects of energy efficiency and energy auditing and will conduct basic audits of select areas in their schools. This activity will serve to inspire students to continue down the green career path by pursuing this cause in college or moving directly into the green workforce out of high school.

*Develop Career Pathways from High School to Higher Education or Energy Career:* Through partnering with school counselors, community colleges and universities to conduct field trips to energy related business and training centers, conduct school assemblies focused on energy issues and the importance of energy careers.

- Work with existing school clubs to incorporate green job information and training into club activities,
- Providing students with career path information, including relevant degree or certification offerings with community colleges and universities,
- Encouraging students to pursue internship opportunities with the Green Campus program, and
- Organizing career days at the IOUs where students can learn about career opportunities and the important work performed to help the environment and reduce GHG. If this is not feasible, green schools will organize school assemblies where IOU experts can come and talk to students about energy, careers and answer questions.

*Mid-Year Meetings:* School teams meet mid-academic year to share successes and challenges of program implementation and to make plans for the second semester of the school year. Documentation of the meetings will be provided, including the agenda, list of attendees, materials distribution list, second-semester school plans, and workshop evaluation.

*Energy Baseline:* Work with SCE Account Management, Institutional Partnerships and/or Business group to establish a baseline and provide ongoing energy usage support. This function serves several purposes, 1) show the district/school the energy costs benefit of implementing operational changes, 2) show the students that the schools are practicing what they teach, and 3) students get to realize the impact of their actions at schools and this will reinforce the importance of energy management careers.

Coordinate with other internal departments to promote consumer and business incentive programs. The Alliance will provide information to the Green Schools districts about SCE's Consumer and Business Incentive Programs and encourage them to promote consumer programs to parents as well as take advantage of these opportunities for making energy efficiency changes more cost effective.

*Develop, track and report on key performance indicators:*
Green Schools primary focus is to educates students and their families about energy and the link between efficiency, the environment and finances as well as educate students about careers in the field of energy.

**K-College Outreach**

**Mobile Education Unit (SCE only)**

This program will explore behavior-based marketing; and allow the utility to generate awareness of its integrated DSM solutions through the Mobile Education Units (MEUs). This program focuses on 1) serving as a mobile classroom for students to learn about energy, the nexus between energy/gas/water, importance of conservation and careers in energy, 2) the integration aspect of outreach by gathering data and delivering information to customers in a way that reaches customers now and provides intelligence to guide future outreach, while education and outreach efforts build awareness for energy efficiency products and services, shift customers attitudes/perceptions, and drive customers to learn more about utility rebate and savings programs that can help them save energy, money and the environment.

To generate awareness for the community, SCE will work closely with existing partners (CARE Capitation agencies, Energy Assistance Fund agencies, and LIEE agencies), local government partnerships, social service agencies, and CBOs and FBO.

SCE will also leverage MEU, whenever appropriate, at outreach events, such as: home shows, trade shows, retail stores, malls, sporting, and public relations events.

The MEU travels to school events as well as community events where there is the greatest opportunity to reach students /customers and change behaviors. The MEU is designed to engage students and customers on location through the use of physical displays and exhibits that explain energy efficiency and offer a hands-on customer experience.

ii. Incentive levels

Not applicable

iii. Marketing and outreach plans, e.g. research, target audience, collateral, delivery mechanisms.

**College and University sector**

**Green Campus**

Marketing and outreach efforts to increase the transparency of campus energy efficiency goals and results, as well as Green Campus projects: Green Campus Interns will launch termed and ongoing educational campaigns for students, faculty, staff and administrators. In order to achieve and sustain cross-campus buy-in for energy efficiency goals and projects set by individual campuses and/or utilities, the program will:

- Promote campus awareness of energy efficiency opportunities and work being done on campus. Green Campus Interns will publish a monthly newsletter describing their ongoing campus outreach efforts, in order to increase awareness about their projects and those of the campus stakeholders and university system.
- Distribute IOU Energy Savings brochures containing details about our commercial and residential EE, DR, DG and Renewable energy programs are provided on campus to administrators and students, and
- Place an emphasis on working with minority and disadvantaged groups throughout the campus.

**Community College Sector**

**DEEP (SCE only)**

This program is targeting community colleges on a limited basis,working with the Community College Chancellor's Office to target campuses with strong sustainability programs.

**California Community College IOU Partnership**

The partnership will implement a training and education (T&E) program focusing on energy efficiency courses for CCC facilities, operations and maintenance staff. The partnership is also actively working with other CCC and community stakeholders on curriculum and Workforce Education and Training Strategies (WE&T) for students and

industry to develop a green career path and workforce in support of the Strategic Plan goals. The basis of the T&E program will be to coordinate with the IOU training centers to customize existing course offerings in the HVAC, controls, lighting, commissioning, and green building areas and deliver them to the CCCs via direct training at the campuses or via telecasts or webinars to many campuses on a distributed basis.

**Adult School / Post High School**

**CLEO**
The CLEO program will promote all energy efficiency and demand reduction programs that would benefit that community using brochures and written materials, interactive displays, newspaper advertising, radio advertising, online website presence, and static displays.

The CLEO program message will encourage customers to participate in SCE's programs and services, and will coordinate with SCG and the local water agencies and will promote increased awareness for customers to understand the structure and opportunities for energy conservation and efficiency, both at home and in their businesses.

**K-12 sector**

**PEAK (statewide)**
This program will be targeted to associations, school districts and teacher conferences. Part of this marketing will include targeting low income and disadvantaged communities. The method used to identify low income and disadvantaged communities is by the percentage of students on school lunch programs. In fact, our goal is that 50% of program participants come from the low income and disadvantaged groups.

- Design & production of PEAK tradeshow marketing materials including a new marketing brochure and other targeted marketing pieces that are consistent with statewide marketing.
- Participate in community events that support marketing of program. Enhance the peakstudents.org website.

**Energenius (PG&E only)**
Each year, more than 10,000 teachers receive a targeted mailing that promotes the Energenius program materials. Annually, the Energenius program exhibits at 11 educational conferences to market the program to teachers. Educational conferences provide a way each year to contact more than 15,000 teachers and other educators.

The Energenius Program in 2013-14 will increase its marketing effort by implementing new internal collaborations within PG&E and expanding upon present efforts. Over the last decade the Energenius take home materials for families have included information that support the low-income programs, rebate offers, and home energy efficiency surveys. Each year up to 80,000 families have received this information brought home by their children who have used the Energenius student materials. In addition, PG&E materials on energy efficiency and those on low-income programs are always available at the teacher conferences where the Energenius program is exhibited. Samples of these materials in languages other than English are also displayed.

Going forward, the Energenius program will help facilitate the promotion of the educational materials by staff working with the low-income programs. While in the communities they could distribute Energenius promotional posters and flyers. In addition within PG&E there are staff and volunteers (e.g. Ambassadors, Junior Achievement) who are in contact with schools and/or teachers that could help promote the programs.

In 2013-14 PG&E will be researching ways to link the Energenius information on its website with external partners that interact with schools in its service area.

**Green Pathways (PG&E only)**

Green Pathways will be marketed within the PG&E service area. As a green career curricular resource, Green Pathways complements a range of curriculum and program offerings in schools, CBOs, and for independent and home school students. Environmental and green curricular offerings such as other IOU Connections and Centergies programs, Green and New Energy Academies, Career Technical Education, and ROP and AP classes will be targeted. Other marketing targets include courses that prepare students for their senior year internships, as well as after school programs, green clubs, and career preparation programs through community organizations.

Each target program has corresponding local or state conferences and meetings at which Green Pathways will present informational material. Webinars or short online dialogues will be hosted to share information about Green Pathways. Collaboration and co-marketing with other programs will expand our reach. Social media including Facebook, Twitter, and Green Pathways offer avenues to reach educators, organizations, and Green Gurus.

**LivingWise® (SCG and SCE)**

Marketing consists of targeted mailing to schools and districts within the affected service area. Information about the program is mailed, emailed, faxed and made available via a web site. Interested schools or teachers would contact the third party vendor to participate in the program. The third party vendor first validates the schools are in IOU service area by contacting the IOU. Once schools have

been involved with the program, they request it again in following years as well as refer other teacher to the program.

- Our marketing will also target low income and disadvantaged communities and, our goal is that 50% of program participants come from the low income and disadvantaged groups. Low income and disadvantaged communities are identified by the percentage of students on a school lunch program.
- Information about our residential EE, DR, DG, and renewable energy programs are provided through the LivingWise® program. This information will be included as part of class discussion as well as taken home to be discussed with parents.
- Teachers truly see the benefit of this program and the impact it has on the students and their families and, it is evidenced by requests year after year to have this program at their schools.

**Green Schools (SCE)**
Since this program is implemented at the district level, this program is target marketed to school districts in the IOU service area. The program will also continue to expand the reach to low-income students. This is a K-12 school program but in support of the California Needs Assessment, will make every effort to enroll a greater number of high schools in the program so as to prepare students for careers in the green workforce and/or higher education with an emphasis in a green career.

- Information about our residential EE, DR, DG, and renewable energy programs are provided through the Green Schools program. This information will be included as part of class discussion as well as taken home to be discussed with parents.

iv. IOU program interactions with CEC, ARB, Air Quality Management Districts, local government programs, other government programs as applicable.

- Will continue to work with State Department of Education (Curriculum Commission) on the development of Energy and Utilities Sector Curriculum Standards that includes the science of energy, energy efficiency and some discussion about green careers.
- Will also work with the UC Office of the President of Academic Affairs and the CSU Office of Degree Programs and Educational Opportunities to 1) promote energy minor or major degree programs, 2) collaborate and/or provide expertise in the development of complementary new and revised courses that will form a comprehensive integrated approach to energy education, and 3) consult with campus-specific administrators to define additional courses needed to meet the growing need for graduates with skills in energy efficiency and related fields.

- Will work with CBOs, FBOs, NGOs, and others as part of the through a WE&T taskforce in an effort to advance WE&T goals.
- Will work with water management agencies, air management agencies or other government entities to establish a network of internship opportunities for students in pursuit of a green career.

v. Similar IOU and POU programs

Similar IOU programs have been described, and no similar POU programs have been brought to our attention.

b) Program delivery and coordination

i. Emerging Technologies program

This program will have regular communication with the ETP, as emerging technologies will be very important in what is taught all levels of the education system.

ii. Codes and Standards program

We have discussed this WE&T effort with Codes and Standards and have agreed to keep the lines of communication open and schedule ongoing discussions.

iii. WE&T efforts

The WE&T Connections Subprogram will support the other IOU EE Programs as appropriate.

iv. Program-specific marketing and outreach efforts (Budget provide in Table 1)

Refer to Section 6.2.a.iv. for all discussion of marketing and outreach plans.

v. Non-IOU Programs

We currently collaborate with local water agencies with a few of our programs and will continue doing so for the 2013-2014 cycle. Additionally, we will work to involve and coordinate some of our educational efforts with environmental agencies/groups to show the linkages between energy conservation and the environment.

vi. CEC work on PIER

No anticipated direct work with PIER from this Subprogram's activities.

vii. CEC work on codes and standards

The IOUs will work with the CEC and the IOU Codes and Standards programs to improve code compliance through coordinated education and training delivery.

viii. Non-utility market initiatives

Refer to WE&T Planning Subprogram Section 6.3 for more discussion on efforts in the education and community sectors.

c) Best Practices

These programs have incorporated already California Needs Assessment Study recommendations and will work to incorporate Opinion Dynamics study recommendations as the study is released in 2012.

**Green Campus** – Lessons learned from past program cycles have been transformed into best practices as well as feedback of past process and impact evaluations, and included in program re-designs. Some recommendations provided in mid-cycle that were feasible for implementation, were implemented successfully. Additionally, the California Needs Assessment recommendation have incorporated has been included in the redesign for 2013-2014.

**DEEP –** DEEP was created as a result of the CA Needs Assessment study form 2011. The study identified a gap in service for this community college sector and SCE moved quickly to close that gap by developing an innovative community college program.

**CLEO** - Media marketing has proven to be the primary mechanism to generate community awareness about the CLEO Program and its offerings. Internal metrics further outline the importance of the marketing mix, as well.

The program relies on a dynamic EM&V to gauge the program's success and to listen to the customer for feedback. These are transformed to 'lessons learned' and incorporated in to the program strategy and offerings. For example, in 2006-2008, costly television spots were swapped for effective newspaper and radio spots, as illustrated above.

**PEAK** – The first PEAK program was launched in Laguna Beach in 1979 and since then has evolved into the comprehensive, standards based program that exists today, reaching thousands of students across California. Past experiences have lead to best practices in the following years. Additionally, PEAK is the recipient of the 2010 Governor's Environmental and Economic Leadership Award.

**Energenius** - This educational series continually evolves to address the changing needs of classroom teachers and their students. The Energenius program strives to create quality materials that reflect California State Department of Education (CDE) frameworks and connect with content standards.

Another important practice that has increased in importance over the years is the early involvement of classroom teachers beginning with pre-development focus groups. Teachers are recruited to review draft materials and submit written evaluations. The piloting of selected lessons and activities with students is encouraged. Input from teachers, both formal and informal, has been valuable in the development of the teacher guides, student activity books and other materials found in the eight Energenius programs.

Exhibiting and meeting teachers at educational conferences has been another important practice. Besides providing a "pulse" to what is going on in schools teachers at these conferences offer numerous comments and ideas related to existing and future materials. Teachers for example, at an early childhood conferences were asking when PG&E will have its pre-kindergarten program as we know that "good energy-saving habits" begin early. With this encouragement, a new Energenius pre-K program is being launched in 2012.

**LivingWise®** - Lessons learned from past program cycles have been transformed into best practices as well as feedback of past process and impact evaluations, and included in program re-designs. Some recommendations provided in mid-cycle that were feasible for implementation, were implemented successfully. Additionally, the California Needs Assessment recommendations have been incorporated in the redesign for 2013-2014 .
**Green Schools** - Lessons learned from past program cycles have been transformed into best practices as well as feedback of past process and impact evaluations, and included in program re-designs. Some recommendations provided in mid-cycle that were feasible for implementation, were implemented successfully. Additionally, the California Needs Assessment recommendations have been incorporated in the redesign for 2013-2014.

d) Innovation

**DEEP –** This program was developed and implemented to address a gap in services identified in the CA Needs Assessment study of 2011.

**Energenius** - The program materials have been developed by PG&E so the cost for implementing statewide (printing and developing new programs with statewide reach) keeps the cost low. It is relatively easy to make changes to the curriculum and incorporate information about energy efficiency programs and services, issues related to global climate change, and green careers.

e) Integrated/coordinated Demand Side Management

IDSM concepts are incorporated in Connections programs on an age appropriate basis, as described in previous sections.

f) Integration across resource types

All of the University, Community College, and K-12 components will include curriculum to help students understand the science of energy, energy efficiency and conservation,

demand response, and renewable and distributed generation, as well as the environmental and economic impacts of energy consumption. Also, the goal is for students to understand the energy-related environmental connections, such as global climate change and the linkage between greenhouse gas emissions and energy use. In addition, materials will go beyond the energy efficiency fundamentals and introduce information on careers and job opportunities in energy-related fields and in the green economy.

g) Pilots

i. **Green Training Collaborative (SCG):** This program pilot by SCG will continue in 2013-2014. This is a pilot program to involve local community education institutions and training programs in energy related career development strategy sessions. SCG will coordinate with regional implementers of such career programs to discuss projects that allow students and other potential green workforce candidates to explore energy efficiency, integrated demand-side management technologies and resources management techniques. The program would be to add experience to participants pursing green careers and employment unique to the region. The program will be evaluated to determine best practices that evolve in tailoring career develop coordination for specific regional needs. The program will rely upon fund and resource sharing from among the collaborative.

h) EM&V

The utilities are proposing to work with the Energy Division to develop and submit a comprehensive EM&V Plan for 2013-2014 after the program implementation plans are filed. This plan will include process evaluations and other program-specific studies within the context of broader utility and Energy Division studies. More detailed plans for process evaluation and other program-specific evaluation efforts will be developed collaboratively by the utilities and the Energy Division. Development of these plans will occur after the final program design is approved by the CPUC and, in many cases after program implementation has begun, since the plans need to be based on identified program design and implementation issues.

7) Program Diagram

See above Section 6.2.

8) Program Logic

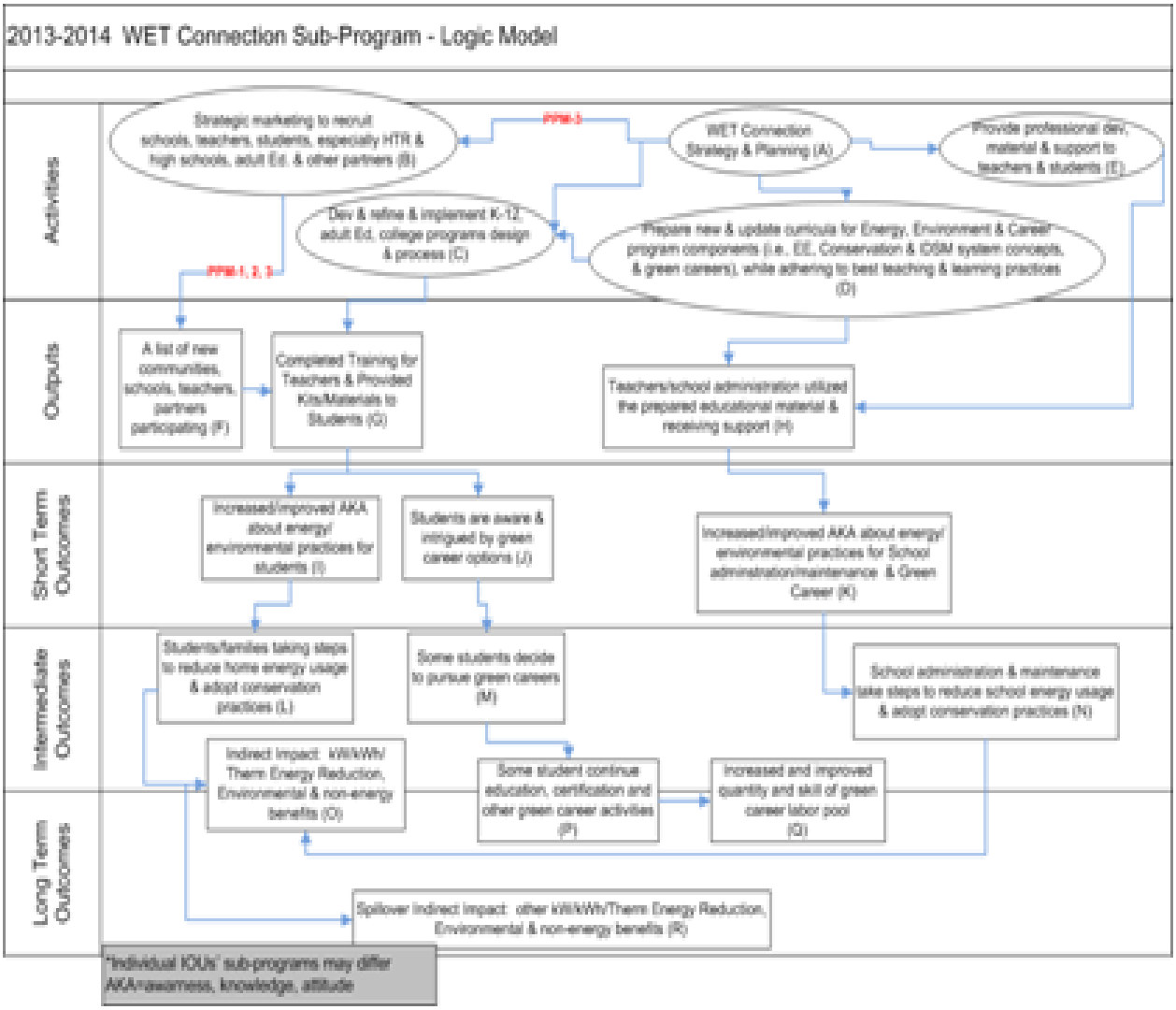
Below is the logic model for the WE&T Connections Subprogram.

The activities shown in the Connections logic model fall into two primary categories. The first is focused on marketing programs, especially to hard-to-reach and disadvantaged communities. In addition to marketing efforts directed at Title 1 schools, this activity will include partnering with organizations that operate in the communities of Title 1 schools.

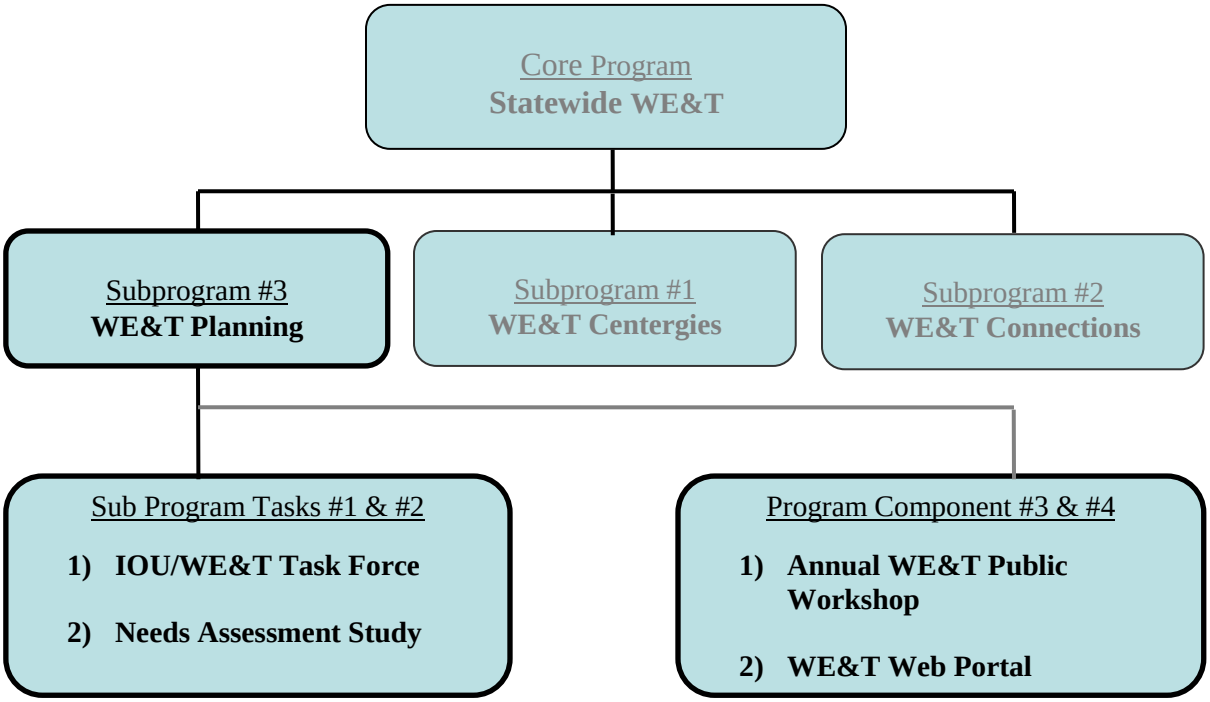
The second focus of the Connections activities is on preparing new curricula and refining program design and processes. It is expected that these activities will produce programs and curricula that lead students to understand energy and conservation and their importance, as well as how to use energy efficiently in their households. They are also expected, as a result, to influence their families to do the same. Likewise, some curricula support the incorporation of energy efficient practices and technologies in classrooms and schools.

The curricula and program design will include information and resources on career options in energy-related fields, with an intended outcome being that some of the students exposed to green career resources will ultimately decide to pursue green careers as a result.

All of these activities are expected to lead to classes that improve AKA of students, their families and teachers and encourage students to pursue green career options. Activities focusing on saving energy on school campuses will also lead to improved AKA about energy and environmental practices within the school and at home for the students. Ultimately, these activities and outputs are expected to result in indirect energy savings.


2013-2014 WET Connection Sub-Program - Logic Model
Activities
Outputs
Short Term Outcomes
Intermediate Outcomes
Long Term Outcomes
Strategic marketing to recruit schools, teachers, students, especially HTR & high schools, adult Ed. & other partners (B)
PPM-1
WET Connection Strategy & Planning (A)
Provide professional dev, material & support to teachers & students (E)
Dev & refine & implement K-12 adult Ed, college programs design & process (C)
PPM-1, 2, 3
Prepare new & update curricula for Energy, Environment & Career program components (i.e., EE, Conservation & O3M system concepts, & green careers), while adhering to best teaching & learning practices (D)
A list of new communities, schools, teachers, partners participating (F)
Completed Training for Teachers & Provided Kits/Materials to Students (G)
Teachers/school administration utilized the prepared educational material & receiving support (H)
Increased/improved AKA about energy/ environmental practices for students (I)
Students are aware & intrigued by green career options (J)
Increased/improved AKA about energy/ environmental practices for School administration/maintenance & Green Career (K)
Students/families taking steps to reduce home energy usage & adopt conservation practices (L)
Some students decide to pursue green careers (M)
School administration & maintenance take steps to reduce school energy usage & adopt conservation practices (N)
Indirect Impact: kW/kWh Therm Energy Reduction, Environmental & non-energy benefits (O)
Some student continue education, certification and other green career activities (P)
Increased and improved quantity and skill of green career labor pool (Q)
Spillover Indirect Impact: other kW/kWh/Therm Energy Reduction, Environmental & non-energy benefits (R)
*Individual IOUs' sub-programs may differ
AKA=awarness, knowledge, attitude

6.3) Sub-Program Implementation – WE&T Planning




a) Statewide IOU Coordination

i. Program name

Statewide WE&T Planning is a Sub-Program within the Statewide WE&T Core Program, formed by the IOUs as a direct response to the California Long-Term Energy Efficiency Strategic Plan (Strategic Plan). The WE&T Planning Sub-Program involves management and execution of several strategic statewide planning tasks intended to help sustain momentum in long-term WE&T development and strategic planning, including identification of funding streams and market sector specific needs.

The WE&T Planning Sub-Program was created to facilitate implementation and completion of the four key strategic tasks identified in the Strategic Plan to drive long-term WE&T development:

1) Form an IOU/CPUC WE&T Task Force
2) Conduct a Needs Assessment
3) Create a WE&T Specific Web Portal
4) Annual WE&T Public Workshops

In order to meet the state's growing workforce demand, a concerted planning effort that includes a variety of initiatives and funding sources beyond ratepayer funds is required. Such an effort will demand the collaboration and involvement of secondary and post-secondary education leaders, technical and professional organizations, state agencies, economic and labor development organizations, utilities, and construction and manufacturing businesses that deliver energy efficiency solutions. The IOUs will support the larger statewide effort, and will help ongoing development of WE&T programs through their WE&T Planning coordination.

ii. Program delivery mechanisms

Implementation activities will be informed by the statewide scoping study and needs assessment. The IOUs are expected to direct much of the work needed to complete the assessment, which will identify existing WE&T infrastructure and capacity, anticipate future needs, and specify urgent gaps that need to be addressed.

Based on the statewide needs assessment, a strategic plan, outlining at least existing and anticipated green collar jobs and the skill sets that are likely to be demanded by industry, will be presented. Organizing these skill sets into practical career paths should influence communication, development, and implementation of future WE&T programs.

Funding for actions based on the above mentioned scoping study, needs assessment, dialogue with stakeholders and task force conclusions will be required to impact the WE&T needs in time to support the urgent needs of the Integrated Demand Side Management (IDSM) Portfolio. Such implementation actions may include collaboration with appropriate educational sectors as prioritized by the needs assessment to act as catalysts to enhance conventional educational efforts to accelerate the mainstream adoption of green career support.

The statewide IOU Planning tasks will be shared among any other statewide planning and training implementers and be coordinated, where plausible, with the IOU WE&T Centergies and IOU WE&T Connections Sub Programs. A statewide WE&T web portal could ultimately serve as a central repository for exchanging training and job opportunities, as well as statewide and national developments linked to California workforce initiatives.

Four specific key actions to be completed in the near term to drive long-term WE&T development and strategic planning. The Taskforce formed from the California strategic plan is intended to identify funding streams other than ratepayer funding, identify market sector specific needs, and inform short-term actions to initiate longer-term strategies for each market and educational sector.

1) Energy Efficiency WE&T Task Force. The Task Force is expected to be comprised of energy efficiency and demand side management IOU

program representatives, CPUC staff, labor, industry representatives, and educational experts to fulfill administrative functions including: developing a needs assessment RFP; selecting the third party to conduct the needs assessment; and managing the needs assessment evaluation. The Task Force members will continue to help implement the goals and strategies set forth in this Strategic Plan. Beyond the representation listed above, the WE&T Task Force will rely on commitments for involvement from educators and educational administrators, labor representatives, community-based job training leaders and other non-IOU energy efficiency program implementers

The WE&T Task Force is in the early stages of formulation. Reports on existing WE&T related programs and efforts as well as discussion of new WE&T programs and efforts will be core topics of these meeting sessions. The Taskforce will provide a formal framework for all members to get updates, provide feedback and be actively involved in discussing studies, programs, projects, and WE&T efforts being implemented under the strategic plan and other related state initiatives. Task force meetings represent work sessions to review and refine WE&T coordination efforts among stakeholders.

During 2013-2014, the Task Force is no longer in its early stages of formulation and will continue to engage with stakeholders and provide updated reports on WE&T programs and efforts.

An update on Needs Assessment recommendations was provided in the Joint IOU WE&T Annual Report, submitted on May 1, 2012. Per the Guidance Decision, the IOUs will work with Commission Staff on the WE&T Task Force to develop a data request template to be submitted by Staff as needed for periodic updates on the status of the utility's Sector Strategy activities. This provides a more specific and extended role for the Task Force.

2) *WE&T Needs Assessment:* The Workforce Needs Assessment study identifies preliminary findings, and in some instances, recommendations, for statewide WET program and/or subprogram considerations. The Joint Utilities worked collaboratively with Energy Division staff to select a subset of these findings and/or recommendations to evaluate implementation feasibility as part of the 2010-2012 program activities, which were approved by the Commission through a joint WE&T Advice Letter. The findings of the Needs Assessment (ordered in Decision 08-09-040) and recommendations were presented within one month of dissemination at a public workshop to allow for public comments and further discussion. The findings were made publicly available through posting to the energy efficiency web portal (engage360.com) to the service list in this proceeding and the Distributed Generation and Demand

Response proceedings. Within 60 days from the date of the workshop the utilities will jointly file an Advice Letter to modify the existing Workforce Education and Training statewide program consistent with the Needs Assessment.

Update from May 2012 PIP Addendum:

In compliance with Commission Decision 09-09-047, a joint IOU advice letter was approved by Energy Division by letter dated October 28, 2011. PG&E Advice 3212-G-B/3852-E-B can be found at this link: http://www.pge.com/nots/rates/tariffs/tm2/pdf/ELEC_3852-E-B.pdf.

In addition to the information provided in PG&E's Advice 3212-G-B/3852-E-B, in 2012, PG&E launched a Commercial EE Sector Strategy at a Strategic Convening (Convening) in order to get alignment and coordination around the creation of the Commercial EE jobs necessary to reach PG&E's portfolio goals, as well as initiate new partnerships. PG&E has initiated steps to develop sector strategies in other sectors, including the commercial building HVAC sector, the architectural design sector, and small/medium business building audits. PG&E has restructured educational programs toward structured course series to serve particular sectors. PG&E has also allocated resources and partnered with community colleges and workforce investment boards to assist unemployed building operators toward completing a certificate program series.

Details on these efforts will be provided in the 2012 WE&T Annual Report.

IOUs will implement WE&T sector strategy programs started in 2012. In compliance with Decision (D.) 09-09-047, the Investor Owned Utilities submitted for approval their joint IOU Advice Letter (AL) and supplemental filing proposing modifications to the existing Statewide Workforce Education and Training (WE&T) program based on the recommendations of the WE&T Needs Assessment. The Needs Assessment recommendations focused on a Sector Strategies approach, working closer with trades associations, collaborating with more parties on credentials and certifications, restructuring Energy Center course presentment, support for curricula development, targeting of disadvantaged workers, and evaluation of workforce outcomes. Other relevant Needs Assessment recommendations focused on collaboration with the all educational sectors, career education, and evaluation plans on K-12 programs. The Advice Letter provided a general outline of the plan the IOUs would be following to achieve progress for enhancing and more clearly demonstrating necessary changes to the IOU WE&T program to align with shifts in IOU resource program requirements and industry workforce demands. Comments submitted prior to the Guidance Decision illustrate the varying uncertainty on long-term career pathways into green jobs. The IOUs indicated actions to be achieved during 2012 based

primarily in response to the Needs Assessment recommendations, recognizing there were impending change forthcoming in such areas as IOU Residential, Commercial and HVAC SW programs. The current 2013-2014 Guidance Decision provides significant guidance that will allow the IOUs to move more decisively on its Sector Strategies action plan. The general plan of action proposed for 2012 will take greater shape and the 2013-2014 period will provide a critical space to apply and align Sector Strategies approaches with the Residential sector Energy Upgrade California program, Emerging Technologies, Commercial Buildings programs and Codes & Standards.

Per the Joint IOU Advice Letter, activities to develop sector strategies that are currently in progress and will be put into place as other workforce sectors become part of the Energy Centers' focus include:

- Develop partner criteria desired to help achieve goals and objectives for each targeted Sector Strategy area
- Identify potential Sector Strategy Partners based on desired criteria and existing collaborations as well as necessary "new" ones for each targeted Sector Strategy area
- Outreach to identified partners for each targeted Sector Strategy area
- Initiate IOU / Partner working group for each targeted Sector Strategy area.
- Identify shared goals & objective for each targeted Sector Strategy area.
- Develop a shared vision & mission statement with corresponding goals & objectives for each targeted Sector Strategy IOU / Partner working group
- Identify and develop timelines & roadmaps / action items / roles & responsibilities for each targeted Sector Strategy IOU / Partner working group
- Identify reporting vehicles and reporting schedule for each targeted Sector Strategy IOU / Partner working group

- Within each Sector Strategy working group, initiate identification of lessons learned / best practices and executable partnership activities that help achieve goals and objectives previously identified. These lessons learned, best practices and activities will be included in program planning for the next program cycle.

The IOUs propose continuation of the approved joint IOU Advice Letter plan of action through 2013-2014 in coordination with changes occurring among resource programs directed in this Decision, as well as workforce skills and qualifications demanded in the market place.

3) *WE&T Web Portal:* The web portal will include links to various demand-side management (DSM) related training programs and will allow for a single point of communication. The portal will also serve as a repository for demand-side management and energy efficiency training, educational conferences, and career opportunities. This portal will be created and funded in collaboration with other appropriate entities, and linked to the statewide energy efficiency web portal. The initial planning was to develop the WE&T web portal within the existing EE Web Portal (www.engage360.com). However, the October 13, 2011 Assigned Commissioner's Ruling from Commissioner Ferron required that IOUs suspend all spending on the EE web portal. Further direction was provided in D. 12-05-015 (OP 127) that the web portal content from Engage 360, shall be fully migrated to the Energy Upgrade California web portal, with the Engage 360 web portal decommissioned, by no later than the end of 2013. Once the web portal content has been migrated, the WE&T Program seeks to also minimize web portal maintenance costs while maintaining its commitment to delivering a workforce portal... IOUs will work with the ME&O program to explore creating web content linked to the statewide eEnergy Upgrade California web portal.

IOUs propose continuing portal development of relevant WE&T functionality under EUC portal as part of 2013-2014:

- Including links to training programs, adult educational facilities, labor and trade organizations, as well as IOU training.
- Include an events and activities component that highlights upcoming green energy conferences and workshops.
- Feature a Career Center that will be organized around the Energy Upgrade California Program.
- Include information on industry authorities, associations and advisory bodies, including the WE&T statewide Task Force.
- Leverage features of the EUC web portal that support profile pages, online repository and connectivity with IOU programs and market opportunities. Integrate/utilize available social web technologies/applications to build online interaction.
- Leverage connectivity tools/functionality of the EUC web portal to connect users with specific interests, job listings, training program announcements, webinars, and conferences.
- Explore the ability for users to communicate with other users, hosted on the site.

4) *Identify And Implement Specific Programs For Each Educational Sector:* WE&T needs are best studied and approached by supporting educational sectors. Thus, five educational sectors have been identified as key in fulfilling WE&T needs and opportunities: Kindergarten through high school, adult education and community colleges, technical training, colleges and universities, and minority, low income and disadvantaged communities.

iii. Incentive levels

Not applicable

iv. Marketing and outreach plans

*Market Transformation Information*
Completion of the Needs Assessment, along with the aggregation of other developing study workforce training could be used to establish baselines from which to establish measureable goals. A few reasonable metrics to measure market transformation in the interim might be identifying funding streams for statewide parties to implement WE&T programs; WE&T Taskforce initiated actions, status and results; measuring utilization of WE&T web portal statistics.

*Market Barriers and Solutions*
The WE&T Planning Sub Program is intended to focus performs tasks that keep statewide stakeholders connected and focuses on delivering a sustainable long-term education and training network that creates a green jobs workforce. The tasks to be completed involve leveraging the resources of the CA-IOUs to help disseminate available statewide energy efficiency curricula and training from among education, labor, industry and grassroots community sectors. This will require a considerable commitment and trust among disparate agencies and entities that make up these sectors where there are inherent barriers which mike it difficult to form an effective energy career training network.

The WE&T Planning is a complimentary program to make the best use of IOU resources to achieve multiple objectives. The IOU education and training activities primarily center around utilization of Energy Center and Training Center assets, but training efforts now reach beyond the internal walls of IOU facilities shown in the form of relationships with non-IOU training contractors, education institutions, community groups and governmental agencies. This is important in order for IOUs to help share a role in the growth of coordinated statewide workforce education and training. But just as the IOUs have pursued statewide consistency in offering education and training over several years, expectations to see the same occur among California's various education and training stakeholders cannot be over simplified.

The IOUs have represented a reliable and experienced delivery channel of education and training program curricula when few other options have been available. Like other service providers, all parties must expect a process that will involve progressive steps toward solutions that make achievement the State's energy objectives reasonably possible.

*Advancing Strategic Plan goals and objectives*

In support of the Strategic Plan vision that "by 2020 California's workforce is trained and engaged to provide the human capital necessary to achieve California's economic energy efficiency and demand-side management potential," IOUs plan to implement a variety of workforce development strategies that encourage and nurture the development of "green collar" jobs through their strategic planning initiatives, and education and training programs.

Training that advances the business of DSM, EE, and green energy technology benefits students, who then enter green careers and advance the State's very intense energy efficiency goals. Statewide IOU representatives, key traditional education sector representatives, the business community and professional / industry associations at all levels will work together to share protocols and best practices for energy efficiency education through the WE&T Taskforce.

WE&T Planning tasks are intended to outreach to minority, low income and disadvantaged communities for greater participation. This more focused and targeted step will be coordinated with IOU Low-income, Community outreach and Community affairs departments, as well as coordination, where possible, with Marketing, Education and Outreach.

California must quickly increase and integrate statewide efforts to train people at all levels to plan, administer, and deliver energy efficiency in the public and private sectors. The effort will require planning among secondary and post-secondary educational leaders, technical and professional organizations, state agencies, economic and labor development organizations, utilities, and construction and manufacturing businesses that deliver energy efficiency solutions. The Statewide IOU WE&T Program is directed to initiate ongoing dialogue with market participants and education stakeholders by means of annual stakeholder public workshops to help advance a long-term workforce training designs and plans at all levels of California's educational systems and accommodate the dramatic increase in energy efficiency potential envisioned by the Strategic Plan.

The proposed Statewide IOU WET Program relies on collaboration among CPUC Staff, representatives from the education sector, state bodies, each of the IOUs, professional/trade organizations, and the business community to be successful in initiating energy efficiency training needs, along with recommended existing and potential educational delivery strategies and resources that will serve each market an educational sector in the Strategic Plan through 2020 and beyond.

The WE&T Program is constructed to work in cooperation with the IOUs and the WE&T Taskforce to identify sponsors and funding sources to design and expand effective workforce training activities and projects throughout the state.

***Strategy 1-1: Define, initiate and drive long-term WE&T development and strategic planning, including identification of funding streams and market sector specific needs.***

Implementation Actions:

| | |
|---|---|
| Potential Stakeholders | • Statewide IOU Team, including other utilities as well as internal partners<br>• CPUC Staff<br>• Key traditional education sector representatives, including UC/CSU, community colleges, and accreditation programs<br>• Business Community<br>• Professional organizations, including the AIA and United States Green Building Council |
| Sub Program Implementation | • Conduct an in-depth formal statewide energy efficiency training and education resource inventory and needs assessment.<br>• Assess current and alternative funding and partnership mechanisms for WE&T activities.<br>• Create a WE&T specific Web portal and identify entities to co-fund and co-sponsor the Web portal with utilities. Partners shall contribute content toward Web portal<br>• Initiate regular on-going dialogue with broad group of market participant and education stakeholders by way of annual workshops.<br>• Establish task force to oversee and help to evaluate utility specific WE&T activities. |
| Delivery Channel | *WE&T Taskforce* – Conduct resource inventory and needs assessment.<br>*WE&T Taskforce* – Assess and summarize various funding mechanisms for WE&T activities as a needs assessment element.<br>*WE&T Taskforce* – Work with statewide team to develop Web portal for workforce needs.<br>*WE&T Taskforce* – Facilitate the convening of stakeholders for initial and ongoing dialogue with stakeholders.<br>*Ed Train* - Collaborate with WE&T program to inform the process.<br>*WE&T* – Be specific about the scope of work to define what can/will be done and what lies outside the scope of the task force. |

Other long-term strategies and implementation efforts included as goals for the Statewide IOU WE&T Program are addressed in detail within the WE&T Centergies and WE&T Connections Sub-Program sections of the PIP. In summary however, they include:

***Strategy 1-2: Support the community college and adult education efforts to allow students to develop their education based on visible career paths in energy efficiency and related fields***

| | |
|---|---|
| Potential Stakeholders | • California Community Colleges Chancellor's Office<br>• California Board of Education<br>• Adult Education Leadership |

| | |
|---|---|
| | • Department of Employment Development<br>• Industry and Labor Associations<br>• Business Community<br>• Professional organizations with members who need to maintain accreditation<br>• Building Operators Certification Program (BOC) |
| Sub Program Implementation | • Utilize community colleges to provide technical training, such as HVAC maintenance and building operator certification.<br>• Develop appropriate linkages with K-12 programs, focusing on high-school "green academy."<br>• Coordinate with the community colleges and adult education sector to incorporate energy and resource efficiency. Component into their career laddering concept.<br>• Explore ways of disseminating materials electronically through effective use of the Internet. |

***Strategy 1-3: Incorporate energy / resource efficiency and demand side energy management into traditional contractor and technician training, such as for plumbers and electricians, and expand training resources to produce target numbers of trained workers.***

Summary:

| | |
|---|---|
| Potential Stakeholders | • California Community Colleges Chancellor's Office<br>• Community College HVAC program<br>• California Board of Education<br>• Adult Education Leadership<br>• Department of Employment Development<br>• Industry / Labor Associations<br>• Technical and Vocational Training Programs |
| Sub Program Implementation | • Expand or establish training curricula and training and professional career development programs in building construction, services, building operator and other energy efficiency technical fields.<br>• Establish or expand key financial and placement partnerships that demonstrate employment prospects for trained personnel.<br>• Expand upon existing certification programs to try to include student certificate in "green workforce." |

***Strategy 1-4: Create or expand college and university programs with energy efficiency focus and foster green campus efforts to apply this knowledge in clear view of students and faculty.***

Summary:

| | |
|---|---|
| Potential Stakeholders | • California Community Colleges Chancellor's Office<br>• WE&T Task Force<br>• UC/CSU education system<br>• ACEEE education committee |
| Sub Program Implementation | • Utilize existing UC/CSU extension programs to incorporate a continuing education curriculum component.<br>• Work with Universities and colleges to expand professional energy related degree offerings and contribute to tailored curriculum.<br>• Work with colleges and universities to formalize internship opportunities with energy and resource efficiency institutions, including engineering firms, architecture firms, and utility programs. |

***Strategy 1-5: Develop K-12 curriculum to include energy efficiency fundamentals (e.g., math, science, behavior) across various content areas and identify how career education in energy-related fields can be incorporated across the grades.***

Summary:

| | |
|---|---|
| Potential Stakeholders | • CPUC Staff<br>• Key traditional education sector representatives<br>• California Board of Education<br>• WE&T Task Force<br>• Business community<br>• After-school community education programs |
| Sub Program Implementation | • Identify opportunities to leverage governor's career technical initiative.<br>• Identify opportunities to work with the California Department of Education to develop curricula with specific content for energy and GHG issues.<br>• Support outreach into<br>• K-12 schools on energy, water and environmental issues.<br>• Support K-12 schools to develop curricula that support their local communities as part of class assignments. |

***Strategy 2-1: Collaboratively identify appropriate goals and strategies to build California's energy efficiency workforce through 2020, focusing on training that increases participation from within minority, low-income and disadvantaged communities in achieving California's economic energy efficiency potential.***

The number of units receiving education and weatherization services during 2013-2014 program period is expected to expand greatly. During 2009, WE&T will focus on expanding behavior modification in existing training programs to increase emphasis on energy efficient practices.

Additionally, training in the form of train-the-trainer sessions may be possible with third party groups to design and expand teaching of weatherization and energy efficiency in minority and disadvantage communities specifically.

Summary:

| | |
|---|---|
| Potential Stakeholders | WE&T Task Force<br>• CPUC<br>• Key traditional education sector representatives<br>• Business Community<br>• California Community Colleges Chancellor's Office<br>• Continuing Education Programs<br>• Laney and Delta College HVAC program (PG&E)<br>• Department of Employment Development<br>• Industry / Labor Associations<br>• Technical and Vocational Training Programs (e.g., State Prison System)<br>• Community Youth Centers (e.g., YMCA) |
| Sub Program Implementation | • Leverage Marketing Education and Outreach and WE&T task forces to partner with community based organizations and provide targeted outreach on employment opportunities with energy efficiency.<br>• Develop Low Income WE&T Plan<br>• Train qualified diverse business enterprises from minority, low-income and disadvantaged communities to undertake or expand efficiency services. |

b) Program delivery and coordination

WE&T Planning includes involvement from a wide range of stakeholders. Implemented in the appropriate manner, WE&T Taskforce members will represent technology, industry, government, community groups, utilities, education and non-energy segments which should facilitate discussion on ways to share current and emerging opportunities to expand the scope of existing WE&T training curriculum, but introduce new WE&T training activities in the area of emerging technologies, codes and standards, and non-IOU programs.

c) Best Practices

Formulation of statewide WE&T Taskforce and regularly scheduled meetings with statewide WE&T stakeholders represent a best practice that facilitates open discussion among are vested parties. The WE&T planning process will have best practice inputs gathered from evaluation of IOU education and training programs to rely upon in discussing real opportunities and the long-term considerations of programs being shared and presented to the WE&T taskforce and IOUs.

d) Innovation

The whole program can be considered innovative to the degree that statewide coordination and strategic planning is being done, which will help shape California economics in the near term.

e) Integrated/coordinated Demand Side Management

WE&T Planning includes involvement from a wide range of stakeholders. The IOU WE&T representatives in support of the long-term workforce strategy of California to achieve statewide coordination, will work to create coordinated technology demonstration and DSM training to ensure there are no missed opportunities for offering IDSM training and that opportunities to receive such training are made available to the fullest extent possible which will aid efforts in achieving energy neutral buildings by 2020.

f) Integration across resource types

WE&T Planning includes involvement from a wide range of stakeholders. Implemented in the appropriate manner, WE&T Taskforce members will represent technology, industry, government, community groups, utilities, education and non-energy segments and facilitate discussion on ways to share current and emerging opportunities to expand the scope of existing WE&T training curriculum to include water and GHG mitigation.

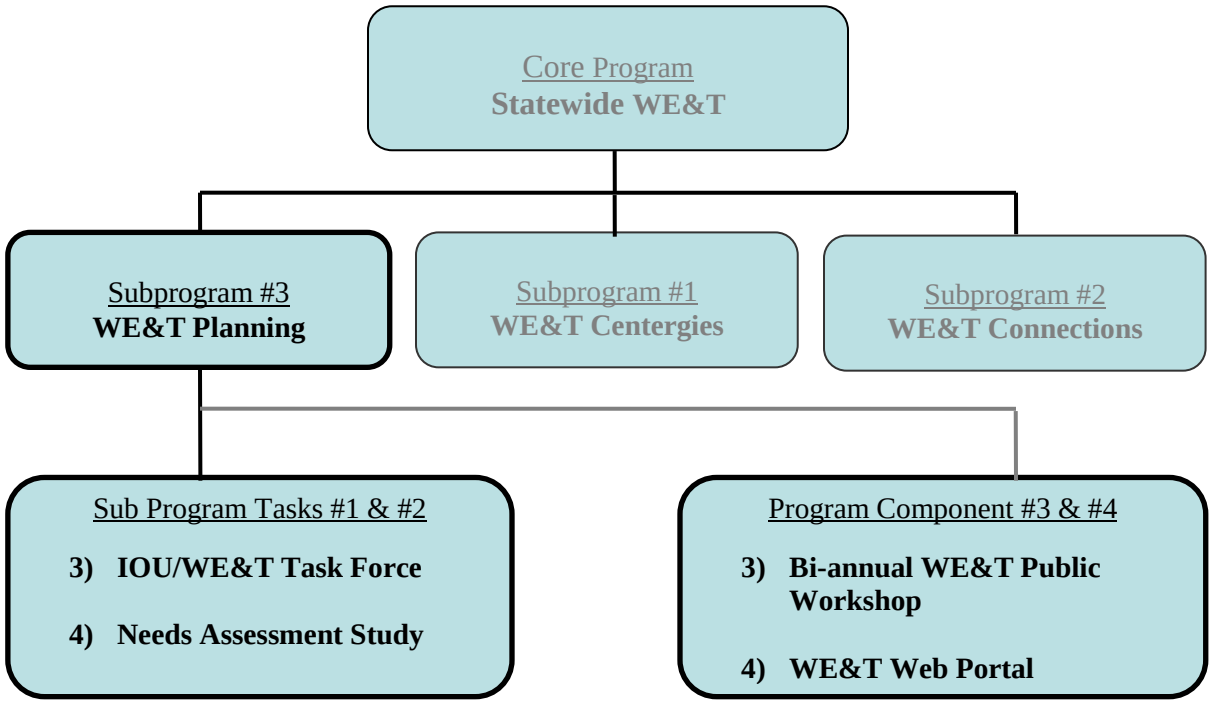
g) Pilots

The whole program can be considered innovative to the degree that statewide coordination and strategic planning with regard to workforce training is being done in a manner that require iteration and learning in order to arrive at implementation models and action steps that can be deemed effective.

h) EM&V

The utilities are proposing to work with the Energy Division to develop and submit a comprehensive EM&V Plan for 2013-2014 after the program implementation plans are filed. This plan will include process evaluations and other program-specific studies within the context of broader utility and Energy Division studies. More detailed plans for process evaluation and other program-specific evaluation efforts will be developed collaboratively by the utilities and the Energy Division. Development of these plans will occur after the final program design is approved by the CPUC and, in many cases after program implementation has begun, since the plans need to be based on identified program design and implementation issues.

7) Diagram of Program




8) Logic Models

See Centergies and Connections subprograms for revised logic models for 2013-2014.

# 2013-2014 PIP Addendum

| | | | |
|---|---|---|---|
| **Program Name** | Integrated Demand Side Management | **Date Submitted** | 7/2/2012 |
| **Subprogram Name** | | **Utility Name** | San Diego Gas & Electric |
| **Program ID** | | **IOU Program Contact** | |
| | | **Program Cycle** | 2013-2014 |

This form is to be used to document any required changes to the Program Implementation Plans (PIPs). The following are triggers that will require a PIP change:

1. Changes to eligibiity rules
2. Changes affecting incentive levels (indicate advice letter approval below if required)
3. Fund shifts (indicate advice letter approval below if required)
4. Portfolio Budget and Other Commission–Directed Changes
5. Changes to Program Theory/Logic Models
6. Addition or elimination of programs and/or sub-programs (indicate advice letter approval below)
7. Changes in program targets
8. Change in sub-program approach - unless the IOUs submit logic models for the sub-programs (to be defined) with IOUs
9. Changes in incented measures
10. Changes in adopted PPMs/MTIs (indicate advice letter approval below if required)

**Identify Specific Trigger (above) requiring the PIP change**

4. Portfolio Budget and Other Commission-Directed Changes

**Driver of Change:**

Program implementation changes as directed in Commission Decision (D.)12-05-015 Decision Providing Guidance on 2013-2014 Energy Efficiency Portfolios and 2012 Marketing, Education and Outreach.

**Description of Change (if advice letter approval required, indicate Commission resolution or approval and provide hyperlink to advice letter):**

Revisions to the Statewide IDSM PIP as directed in D.12-05-015.

SDG&E's Local IDSM program efforts have been incorporated within the statewide IDSM Program. Funding for Integrated Education and Training has been transitioned to the statewide WE&T Program.

**PIP Section and/or Wording to be Changed or replaced:**

As shown in the attached revision.

**Replacement Language or Information**

As shown in the attached revision.

**Revised Energy Savings (If Any):**

N/A – nonresource program.

**Other PIP Changes Required:**

As indicated above

Revision Date: 05/11/2012

1) **Program Name**: Integrated Demand Side Management[1]
**Program ID#:**
**SDG&E Program Type:** Core

2) **Projected Program Budget Table**

Table 1

| Program Code | Program Name | Administrative Amount | Marketing Amount | Direct Install Amount | Incentive Amount | Total Budget Amount |
|---|---|---|---|---|---|---|
| | SW Integrated Demand Side Management | | | | | |
| 3282 | SW-IDSM-IDSM | $60,925 | $0 | $354,125 | $0 | $415,050 |

3) **Projected Program Gross Impacts Table**

Non-resource program.

4) **IDSM Program Description**

a) Description

The California Long Term Energy Efficiency Strategic Plan (Strategic Plan) encourages programs that integrate the full range of demand-side management (DSM) options including energy efficiency (EE), demand response (DR), and distributed generation (DG) as fundamental to achieving California's strategic energy goals. This program implementation plan (PIP) presents the coordinated effort that Pacific Gas and Electric Company (PG&E), Southern California Edison (SCE), San Diego Gas and Electric Company (SDG&E) and Southern California Gas Company (SoCalGas), (together referred to as "the IOUs") will make to integrate those DSM options in full collaboration with the Commission's Energy Division in compliance with Decision (D.) 09-09-047 that approved the IOU Statewide IDSM program and the 2013-2014 Guidance Decision that required continuation of IDSM activities.

In addition to the IOUs' individual IDSM pilots, projects, programs, and activities, the IOUs will establish a Statewide Integration Task Force (Task Force). Responsibilities of the Task Force will encompass activities that promote, in a statewide-coordinated fashion, two specific IDSM strategies identified in the Strategic Plan. These include stakeholder coordination (Strategy 1.3)[2] and new technologies (Strategy 1.4)[3]. The IOUs believe that Strategy 1.1—"Carry out integrated marketing of DSM opportunities across all customer classes" should be coordinated with the statewide Marketing, Education and

[1] D.09-09-047, Ordering Paragraph (OP) 33 directs Pacific Gas and Electric, Southern California Edison, San Diego Gas and Electric, and Southern California Gas to jointly submit a revised program implementation plan for the statewide IDSM program through an Advice Letter within 120 days of the effective date of the Decision. This PIP was submitted on January 22, 2010 through Advice 3079-G/3595-E (PG&E) and again at Energy Division's request through supplemental Advice 3079-G-B/3595-E-B (PG&E) on March 10, 2010, and approved in a disposition letter issued by Energy Division on March 12, 2010. The 2013-2014 PIP Addendum incorporates direction from D.12-05-015.

[2] *Id*., Strategy 1.3: Develop integrated DSM programs across resources, including energy, water, and transportation.

[3] Id.,Strategy 1.4: Promote development and support of new technologies that enable or facilitate DSM Coordination and Integration.

Outreach (ME&O) efforts (*see* SW ME&O program implementation to be filed in a separate application for the 2013-2014 period) and implemented at the local level by the IOUs focused on particular segment and customer-specific strategies.

In 2013-2014, the IDSM Task Force will continue to expand its role as a coordinating body across many proceedings, programs, and across the IOUs to identify gaps, best practices and to improve efficiencies around delivery of programs in a comprehensive manner to customers. Task Force representatives will strive to actively participate in all applicable proceedings to help develop of a record in each proceeding that will aid in developing policies, funding opportunities, and mechanisms to promote IDSM.

The Guidance Decision directs the IOUs to continue and expand integration efforts in the following areas:

- **Increased Coordination** across different proceedings with the IDSM Task Force as lead.
- **IDSM Funding**: Consideration of appropriate funding from the other proceedings to support IDSM efforts
- **Increased involvement of Stakeholders**: Inclusion of stakeholders and experts in the efforts of the IDSM Task Force
- **Information on IDSM Projects**: Detailed information on the Pilot programs and projects
- **Audits**: Continued development of the integrated Audit tool
- **IDSM Marketing**: Increased integrated marketing efforts and improved reporting / communicating with ED

b) Statement of Problem and Solutions to Overcome the Problem

There is a policy requirement and need to focus on integration of DSM activities and programs on a statewide and local level by customers, utilities, regulators and legislators.

The CPUC's Strategic Plan provides its vision that "energy efficiency, energy conservation, demand response, advanced metering, and distributed generation technologies are offered as elements of an integrated solution that supports energy and carbon reduction goals immediately, and eventually water and other resource conservation goals in the future." The State Legislature has proposed Assembly Bill AB51,[4] requiring the Commission to integrate the DSM programs within its jurisdiction in order to enable offerings of integrated packages that will maximize savings and minimize costs to ratepayers.

In order to ensure that the vision of IDSM progresses operationally to meet the Strategic Plan, the Task Force will continue to meet regularly to identify and promulgate best practices, address implementation and policy issues, and design effective metrics to measure progress on IDSM

[4] Assembly Bill No. 51, Amended in Assembly June 1, 2009, Amended in Assembly May 5, 2009, Amended in Assembly April 14, 2009, California legislature—2009–10 regular session; An act to amend Section 399.4 of the Public Utilities Code Relating to Energy.

The Task Force will focus on the eight tasks as defined in D. 09-09-047:

1. **Development of a proposed method to measure cost-effectiveness for integrated projects and programs including quantification and attribution methods that includes GHG and water reductions benefits and the potential long-term economic and electric/gas hedging benefits.**

   ***a. Description:***

   The Commission has approved the California Standard Practice Manual that serves as the reference document for proposed cost effectiveness tests and methodologies for EE programs. IRulemaking (R.) 07-01-041 is considering identifying and approving a cost effectiveness methodology for DR programs, and R.08-03-008 is considering cost effectiveness methodologies to measure the cost benefit of DG programs. To effectively integrate DSM program design, a set of internally consistent proposed cost-effectiveness methodologies need to be developed for integrated projects, and for program efforts that seek to combine all of these demand side resource options within an integrated portfolio. Cost effectiveness is being considered in R.09-11-014.

   ***b. Tasks and Timelines:***

   - Under contract to the IOUs, Black and Veatch completed a whitepaper on integrated cost effectiveness and presented observations and recommendations via a public workshop the first quarter of 2011. The progress of this activity has been on hold pending guidance from the Energy Division.

2. **Development of proposed measurement and evaluation protocols for IDSM programs and projects.**

   ***a. Description:***

   In order to effectively evaluate IDSM programs, activities and pilots, specific protocols need to be developed to document and attribute energy savings, demand reductions and CO2 reductions from various DSM customer activities . The Task Force will coordinate with IOU and ED EM&V resources to develop a proposal of appropriate metrics for assessing integration.

   Draft EM&V protocols will also be applied to the IOU IDSM pilot programs. This exercise will allow for immediate feedback as to the feasibility of the draft IDSM EM&V protocols.

   ***b. Tasks and Timelines:***

   - The Task Force will explore a phased approach to developing appropriate EM&V protocols for IDSM programs and projects. In collaboration with IOUs, ED EM&V resources will develop a white paper that will be publicly vetted.

- Energy Division has put the development of the EM&V white paper on hold until the next steps are determined for the Integrated Cost Effectiveness development activity.

- The IOUs and CPUC will work together on next steps for integrated EM&V efforts.

**3. Review IDSM enabling emerging technologies for potential inclusion in integrated programs.**

***a. Description:***

The Commission has approved various research and development (R&D) and Emerging Technologies (ET) programs in both Energy Efficiency and Demand Response that promote IDSM.

The ET program will focus on integrating hybrid and renewable technologies as well as study and assess interactive effects, especially for technologies like lighting and HVAC. The program will launch demonstration showcases and scaled field placement featuring integrated energy systems for proof-of-concept, technology and usability assessment, market exposure, and public awareness. The IDSM Task Force will track the results of the ET program's technology integration and help to chart its future course and monitor the inclusion of integrated ET products into customer projects.

**b.** ***Tasks and Timelines:***

- The IOUs will explore leveraging emerging-technology efforts through various channels to offer and promote multiple integrated measures such as efficient lighting, HVAC equipment, or pumps coupled with controls that will provide both energy savings and auto-DR capabilities. The IOUs will also explore leveraging existing or emerging technologies that individually or as a system combine EE, DR, DG, AMI, or water-savings potential as part of an integrated program offering.

**4. Development of cross-utility standardized integrated audit tools using PG&E's developed audits as a starting point.**

***a. Description:***

Program evaluation studies conducted for program cycles 2002, 2003, and 2004-2005 clearly identify energy surveys and customer site audits as one of the most powerful tools in creating awareness of energy conservation potential. The IOUs currently offer integrated audits to medium and large customers (generally with demands upwards of 200 kW) that include appropriate EE, DR, and DG/CSI project and/or program recommendations. Integrated audits were described in the Commercial, Industrial and Agricultural Statewide PIPs under the Customer Services sub-program.

**Standardization of Audit and Survey Tools**

The IOUs are working to standardize a statewide audit and survey tools portfolio and customize audit recommendations based on customer profiles, operating characteristics, market sector potential and cost-effectiveness of the offering. This process will consider more meaningful ways to implement the audit and survey tools for the customer and identify choices of potential measures in various DSM programs or technologies specific to a particular customer.

**b.** ***Tasks and Timelines:***

- Timeline for the online tool development for each utility can be found in the Commercial PIP.

**5. Track integration pilot programs to estimate energy savings and lessons learned and develop standard integration best practices that can be applied to all IOU programs based on pilot program evaluations and the results of additional integration promoting activities (i.e., EM&V and cost-benefit results).**

***a. Description:***

In addition to the formal Task Force, the internal IOU teams will actively participate in discussions of the pilots, perform assessments based on data collected from the pilot program managers, and return recommendations based on lessons learned to the management-level staff of the Task Force.

During the 2013-2014 portfolio cycle, the IOUs will work with Commission Staff to ensure that an adequate level of detail is provided in their reports on Integrated Demand Side Management pilot efforts. In addition, per the Commission's direction, the table below describes all Integrated Demand Side Management pilot programs and projects. The offerings address CPUC guidance on resource comprehensiveness, design characteristics, promotion of emerging technologies, and the testing of integrated cost-effectiveness and evaluation methodologies that support IDSM objectives.

**Table 1 – Integrated Pilots**

| Pilot Program | Demand Side Resources Included (1) | Enabling Technologies Included (2) | Emerging Technologies Included (3) | Existing or New Construction (4) | % of ZNE Anticipated (program / avg project) | | Anticipated Savings kWh (program / avg project) | | Anticipated Savings KW (program / avg project) | | Anticipated Savings Therms (program / avg project) | | Program Cycle Budget Allocation (6) | Estimated Avg Cost Per Building | Accounts Included in the Pilot (7) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PG&E- Zero Net Energy | EE, DR, DG | AMI, O | X | RNC NRNC | 40-50% | 40-50% | n/a | n/a | n/a | n/a | n/a | n/a | $6 million (2010-12) | n/a | 25 | Other (O) Enabling Technologies as appropriate based on building type. |
| SCE- Zero Net Energy | EE, DR, DG | AMI, Battery Storage | X | NC | 75 | 80 | 4000 | 200 | 10 | 0.5 | 3000 | 150 | 400,000 | 20,000 | 30 | Have looked at AMI; including any enabling or emerging technologies that make sense for a specific project |
| SCE- Sustainable Communities | EE, DR, DG | AMI, Battery Storage | X | NC | 10 | 1 | N/A | N/A | N/A | N/A | N/A | N/A | 1,100,000 | 55,000 | 8 | Have looked at AMI; including any enabling or emerging technologies that make sense for a specific project |
| SDG&E Behavioral Pilot | EE | AMI Data | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | $2.9 million | $10/year | at least 100K | Comparative usage pilot continuation |
| SCG - Sustainable Communities | EE, DG | AMI, Fuel Cells | X | NC | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 650,000 | N/A | N/A | Other Enabling Technologies as appropriate based on project characteristics |

b. ***Tasks and Timelines:***

During the 2013-2014 period, the IOUs will explore existing project tracking and reporting systems and determine the best approach to consolidate and improve these systems across multiple programs (EE, DR, DG/CSI) and business areas to benefit customers, customer facing staff, internal planning and reporting.

**6. Develop regular reports on progress and recommendations to the Commission.[5]**

***a. Description:***

The Task Force has developed a communications strategy that will include regular meetings and reports to ED; the template is under review.

b. ***Tasks and Timelines:***

- Since Q1 2010, the IOUs have provided quarterly reports accessible through EEGA; discussions are ongoing to determine the appropriate reporting requirements for 2013-2014,
- The Task Force (including IOU and Energy Division representatives) meet in person, as needed, for a deep dive discussion on some of the key area of interest in the report and will continue in 2013-2014.

[5] Heading remains consistent with CPUC directive in D. 09-09-047.

- The Task Force, including subcommittees, holds regular planning and coordination conference calls to discuss progress on integrated activities and will continue in 2013-2014.

**7. Organize and oversee internal utility IDSM strategies by establishing internal Integration Teams with staff from EE, DR, DG, marketing, and delivery channels.**

***a. Description:***

The IOUs will establish internal integration teams with representatives from EE, DR, Energy Savings Assistance Program (ESAP), distributed generation (DG)/Solar, green programs, marketing and delivery channels.

**Deliverables of the Integration Team:**

- Facilitate and communicate to promote inclusion of EE, DR, solar and other offerings (e.g., DG, Rates) into comprehensive energy cost reduction offerings to customers
- Coordinate with marketing team to promote integrated offerings including a centralized marketing function and consistent messaging
- Develop and implement sales and program training for integrated offerings including a targeted customers approach and sales training plan
- Coordinate responses to Commission directives, inquiries and data requests
- Coordinate development and delivery of integrated programs to create seamless market-segment-based customer solutions
- Coordinate/track delivery and progress of integrated pilots and activities
- Participate in regulatory proceedings and filings to maintain consistent, coordinated message
- Review and provide comments on regulatory filings

SCE will develop and begin implementation of an IDSM Action Plan that sets goals, strategies, and tactics across the organization to facilitate and optimize efficiencies gained through the utilization of integrated approaches.
In order to educate and share best practices and experience with integrated products, marketing and sales, integrated sales training will be developed, or in some cases continued, for IOU customer facing, marketing and Program teams. Training will focus on how to present integrated audits and offerings to customers and promote knowledge transfer among participants. Elements will include:

- Training sales representatives from all appropriate delivery channels and program staff on IDSM integration to improve the sales effectiveness of programs; and

- Incorporating IDSM into external events and internal training of customer-facing Sales staff, as appropriate.

***b. Tasks and Timelines:***

These tasks are ongoing within each utility.

**8. Provide feedback and recommendations for the utilities' integrated marketing campaigns including how the working group will ensure that demand response marketing programs approved as category 9 programs are coordinated with EE integrated marketing efforts.**

***a. Description:***

All IOUs are conducting Residential and Non-residential outreach events, developing and delivering collateral, and utilizing website updates and campaigns to cross market programs. Research on customer approach has also been conducted on the effectiveness and appropriate order, timing and combination of bundling of programs to customers. In addition, the utilities held a statewide coordination and communication meeting in May 2011 to discuss integrated efforts and best practices and identify opportunities to coordinate and collaborate. Additional statewide coordination meetings are being held in 2012.

<u>Integrated Local Marketing Education and Outreach Strategy</u>

The IOUs' integrated marketing plans are designed to generate ongoing customer engagement in Energy Efficiency, Demand Response and other DSM programs and services, by providing residential and non-residential customers with the right message, through the right channel, at the right time. The plans will leverage and complement the statewide ME&O activities, which will be designed to provide general energy education and demand side management program information, while prompting residential and small business customers to immediately take action.

In 2013-2014, a new statewide ME&O campaign will focus on creating awareness and educating customers about energy management and integrated DSM. The IOUs expect to leverage the increased interest generated by the statewide ME&O campaign and use that point of contact and education as a step towards deeper EE engagement. PG&E's local integrated marketing strategy will focus on helping customers understand the relevance of EE programs and services and enabling customers to take actions that are appropriate to their needs -- including one-time measures such as rebates as well as deeper whole house retrofits. This local EE marketing strategy will be coordinated through a variety of channels and tactics, with the intent of reaching customers at the right place and at the right time to drive increased participation and ongoing engagement.

Integrated Local Marketing Education and Outreach Messaging
In order to provide customers with relevant messages, the IOUs will use segmentation and internal data analysis to help refine our current understanding of customers' IDSM needs, by customer segment and target offerings appropriately. By cross-selling DSM programs and services that are meaningful to the customer, the IOUs will encourage customers to take action.

When appropriate, integrated messaging will deliver information to customers in a way that bundles relevant EE, DR and other DSM programs and services. For example, the IOUs will develop print and electronic cCase sStudies that feature customers who have implemented integrated solutions in order to address their energy management needs.

In addition to cross-selling DSM programs and promoting bundled solutions ,through integrated campaigns, integrated messaging will also be designed to motivate customers to enroll in web-based billing and analysis tools. This action will enable and encourage customers to better understand and manage their energy usage by taking advantage of the online tools. It will also provide the utilities with additional opportunities to continue to cross-sell DSM programs and services.

Integrated Local Marketing Education and Outreach Tactics
Local integrated marketing campaigns leverage multiple tactics and multiple communications that combine to present customers with a holistic view of programs and service offerings and a connection to the actions customers can take to participate. To reach California's diverse customers, the IOUs will use a mix of communication channels and languages. When possible, the IOUs will utilize the customer's preferred method for receiving communications. Marketing channels may include, but are not limited to: customer call centers, business account representatives, direct mail, email, IOU and 3rd Party websites, bill inserts, outreach events, partnership activities, social media, and ethnic advertising.

Integrated Local Marketing Education and Outreach Reporting
To increase and showcase marketing integration, IOUs will continue to conduct regular coordination meetings to share integration results, review best practices, and identify potential areas for improvement. For example, in May 2012, the IOUs presented an overview of their marketing integration efforts at the Quarterly IDSM Task Force meeting. Additionally, IOUs will continue to submit updates of their integrated marketing activities within their quarterly report.

***b. Tasks and Timelines:***

- The Task Force will continue to work in 2013-2014 with the statewide ME&O effort to ensure integrated messaging and coordination at a statewide level and will identify areas of integration with other demand-side programs by identifying and developing a product planning/review process that involves ME&O members of the IDSM Task Force.

- In 2013-2014, the Task Force will conduct internal review of local utility marketing efforts where there are opportunities to integrate messages and campaigns, resources, and program offerings that promote demand side integration of DR, EE, and DG resources.
- The IOUs will continue to share information with the Task Force on local IOU integrated marketing, training, and education efforts. The IOUs will report all integrated marketing activities in the quarterly reports and will highlight integrated marketing efforts at the regular IDSM Task Force meetings.

c) Program Goals, Strategies and Measurable Objectives

The primary purpose of the Task Force is to facilitate the integration of the full range of IOU DSM program options for California. To achieve this purpose the Task Force will pursue several objectives:

1. Determine membership and identify key liaisons and stakeholders

   Initial Task Force membership will include representatives from each of the utilities, non-utility representatives as appropriate, and from the Commission's Energy Division. Utility membership will include people representation from strategic planning, EE, LIEE, DR and DG programs as well as emerging technologies, marketing, delivery channels and regulatory coordination, and possibly advanced metering. Statewide membership may be expanded to include representatives from the municipal utilities, the California Energy Commission (CEC) and other stakeholders. The Task Force may have regular representation from each of the leads of the other SW Program working groups, such as Industrial, Agricultural, Commercial, Residential, ME&O, WE&T, and New Construction.

   In the 2013-2014 period, the IDSM Task Force will make strides to include subject matter experts and other external stakeholders in the discussions of the eight specific directives in order to get perspective and additional feedback on the various topics and subjects. As directed, the IOUs will work in collaboration with the CPUC to identify and invite stakeholders to participate where and when appropriate.

   The Task Force will coordinate and communicate with teams associated with other programs and proceedings. Included in this effort is the ESA Integration Working Group; the Task Force and the ESA Integration Working Group /subcommittee work together to maintain directional alignment and to identify and report on best practices across the EE, ESAP and other proceedings.

2. Continue to identify and describe progress of:

   - Existing utility activities, efforts, programs and pilots,
   - IDSM best practices, and

- IDSM metrics (including pilots) and cost effectiveness methodologies

3. Identify key issues affecting successful integration cost-effectiveness, enhancing progress on technical innovations and regulatory jurisdictional issues. The Task Force will work with ET and program planning staff to develop potential solutions to the issues raised, and then follow through to see that the solutions are represented in future program modifications.

4. Develop metrics and reporting mechanism for tracking success of integrated efforts (EM&V protocols) consistent with the EM&V development plan described earlier in section 4.A.2.

5. Develop proposals for policy and program initiatives necessary to forward IDSM.

6. Establish program-funding protocols.

7. Identify and recommend adoption of enabling/supporting policies for inclusion in appropriate DSM programs and reports consistent with descriptions in prior sections of this PIP.

8. Identify and propose changes to inhibiting policies, metrics and reports consistent with descriptions in prior sections of this PIP.

***Tasks and Timelines***

Goals defined above will involve ongoing efforts of the Task Force.

d) Target Audience(s)

The target audience for this statewide IDSM program effort is IDSM stakeholders including, but not limited to, the IOUs, CPUC, CEC, DSM solutions providers (e.g., EE service providers, DR aggregators, CSI installers) and utility customers.

e) Identify If and How this Program will Provide any Elements of Workforce Education and Training (WE&T)

To date, the Task Force has collaborated with the statewide WE&T team to develop the acceptable protocol for integrated training at the training centers. The Task Force will continue to identify and report best practices. Any IOU budgets associated with Integrated WE&T are included in the WE&T PIP.

## 5) Program Rationale and Expected Outcome

The Strategic Plan calls for an ongoing task force to establish a blueprint for integration. A statewide non-resource program is an effective means of coordinating such a blueprint.

a) Quantitative Baseline and Market Transformation Information

Program Performance Metrics (PPMs)

On December 2, 2010, the Commission issued Resolution E-4385, approving Program Performance Metrics (PPMs) for Pacific Gas and Electric Company, Southern California Edison Company, Southern California Gas Company and San Diego Gas and Electric Company for 2010-2012 statewide energy efficiency programs and subprograms. The Commission gave each PPM a metric type which indicated the reporting frequency: Metric type 2a indicates that the IOUs should report on the metric on an annual basis (unless indicated otherwise). Metric type 2b indicates the IOUs should report on the metric at the end of the program cycle.

Below are the approved PPMs and metric types for the Integrated Demand Side Management Statewide Program (Resolution E-4385, Appendix A):

| PROGRAM PERFORMANCE METRIC (PPM) | Metric Type |
|---|---|
| 1. Awareness and knowledge among relevant IOU program staff (to be specified – e.g. account reps, engineers that administer the audit (3rd party); program designers and managers) regarding how IDSM relates to and impacts their efforts and programs | 2b |
| 2. Complete and make available integrated audit or survey tools (on line and on-site) to residential and non-residential customers in all IOU programs that provide audits / surveys (and include EE, Demand Response (DR), and Distributed Generation (DG) recommendations). (Y/N) | 2b |
| 3. Number and percentage of integrated audits provided to each customer class and NAICS code. | 2b |
| 4. A status report that identifies how well "integrated" (EE, DR, DG) all IOU demand-side energy program offerings and components are (e.g., CEI, Commercial, Agricultural, Industrial, Residential, Audits) including lessons learned, best practices, improvement plans, and how the program portfolio is addressing strategic planning goals / objectives and D.09-09-047 directives regarding integration, as well as the IDSM program objectives specified in the PPM Worksheet. The report will review how the IOUs have developed internal and external frameworks that support integration of IDSM programs and technologies. (Y/N) | 2b |
| 5. Number and percent of integrated audit participants (identify NRA participants) in all customer classes (Residential, Commercial, Industrial, Agriculture) that implement recommended DSM measures / participate in other DSM programs (EE, DR, DG – Track which categories implemented / participated in) or other recommended technical process and practice improvements. (If possible, identify whether participants received incentives or not.)*<br><br>*Data sources for reporting will come from (a) program tracking databases and (b) process evaluation to refine estimates. | 2b |
| 6. Program participant awareness of IDSM practices in each of the market sector subprograms. | 2b |

b) Market Transformation Information

Per Resolution E-4385, a subset of market transformation indicators (MTIs) for statewide energy efficiency programs and subprogramswas presented at a public workshop on November 7, 2011, to allow for public comments and discussion before being finalized. No MTIs were identified for the IDSM Program.

c) Program Design to Overcome Barriers

As stated in the Strategic Plan, "Historically, demand side management (DSM) options for energy consumers have been "siloed" activities within regulatory bodies, utilities, environmental organizations, and among private sector service providers. The current narrow focus on a single product offering does not maximize energy savings nor minimize the costs of program delivery." The Task Force and associated integration efforts within each utility is working to overcome this and other barriers to maximize benefits for customers and reduce costs for ratepayers.

d) Quantitative Program Targets

Not applicable for this non-resource program.

e) Advancing Strategic Plan goals and objectives

In support of the Strategic Plan,[6] the IOUs will evaluate the DSM pilot programs and determine what components will lead to successful DSM integration, consistent with the strategies in the Strategic Plan. The Task Force will discuss the applicability of these Emerging Technologies and initiatives in the context of IDSM. The ET program will undertake a coordinated effort to support innovation in EE, DR, and renewable / self-generation. ET forums will be used by the Task Force to review and vet proposed ET technologies that can be funded and integrated across DSM programs. Lastly, through coordinated DSM marketing, the Task Force will promote program integration across the DSM campaigns in order to maximize EE, DR and DG opportunities.

**6) Program Implementation**

a) Statewide IOU Coordination

This is a statewide program.

i. Integrated Demand Side Management

ii. All program delivery mechanisms

[6] California Long Term Energy Efficiency Strategic Plan, Section 8,4 pp. 72-73.

As described earlier in this document, the Task Force does not replace the individual IOU governance of DSM programs and is not intended to duplicate reporting or regulatory activities.

iii. Marketing materials and message

The Task Force will work with the Statewide Marketing and Outreach and internal IOU M&O teams to leverage statewide awareness and coordinated program messaging, and explore utilizing educational efforts that direct customers to local utility integration efforts and offerings.

iv. IOU program interactions with CEC, air resources boards, air quality management districts, local government programs, other government programs, community-based organizations, non-governmental organizations, manufacturers, retailers, trade and business associations, as applicable.

The IDSM Task Force will explore opportunities to interact with other programs/ organizations that could include municipal utilities, local and state government, water districts and DSM solutions providers to offer integrated services, obtain input/feedback, share knowledge/best practices, and generally promote IDSM efforts and activities. Expansion of Task Force participation may be in the form of periodic expert input and ad hoc workshops as needed to solicit input from the broader group of participants in a fair and equitable manner. Future program milestones, lessons learned, and best practices can be shared with outside stakeholders to further IDSM activity outside of IOU programs.

v. Similar IOU and POU programs

The IDSM Task Force will coordinate with all IOU SW programs and will interact with other programs/ organizations, municipalities and DSM solutions providers to offer integrated services. Future program milestones, lessons learned, and best practices can be shared with outside stakeholders to further IDSM activity outside of IOU programs.

b) Program Delivery Mechanisms

The Task Force will not be involved in direct implementation but will develop and provide the knowledge necessary to promote integrated program delivery mechanisms.

c) Marketing Plan

The Task Force will not be providing direct marketing services, but the coordination of marketing will be an integral part of integrated approaches and will be included in each individual program's approach where applicable. In addition, as described in Task 8, above, the Task Force will work with the Statewide and internal Marketing and Outreach teams to leverage statewide awareness and coordinated program messaging; and explore

utilizing educational efforts that direct customers to local utility integration efforts and offerings.

d) Best Practices

The Task Force's involvement in reviewing utility integration activities, pilots and practices (e.g., Zero Net Energy, Food Processing) will lead to the establishment of Integrated Best Practices.

e) Innovation

Individual utilities are working on integrated approaches locally to meet customer needs on a comprehensive, solutions-based level and coordinating and tracking of these integrated pilots and activities.

f) Integrated/coordinated Demand Side Management

The basis of this program is entirely integrated and coordinated demand side management on a statewide basis with local efforts feeding into the overall strategy.

g) Integration Across Resource Types

Where possible, the Task Force will identify opportunities for integrating across non-energy areas. Most likely, this information will come from pilots and other customer-focused activities and will be considered future pilots and best practice recommendations.

h) Pilots

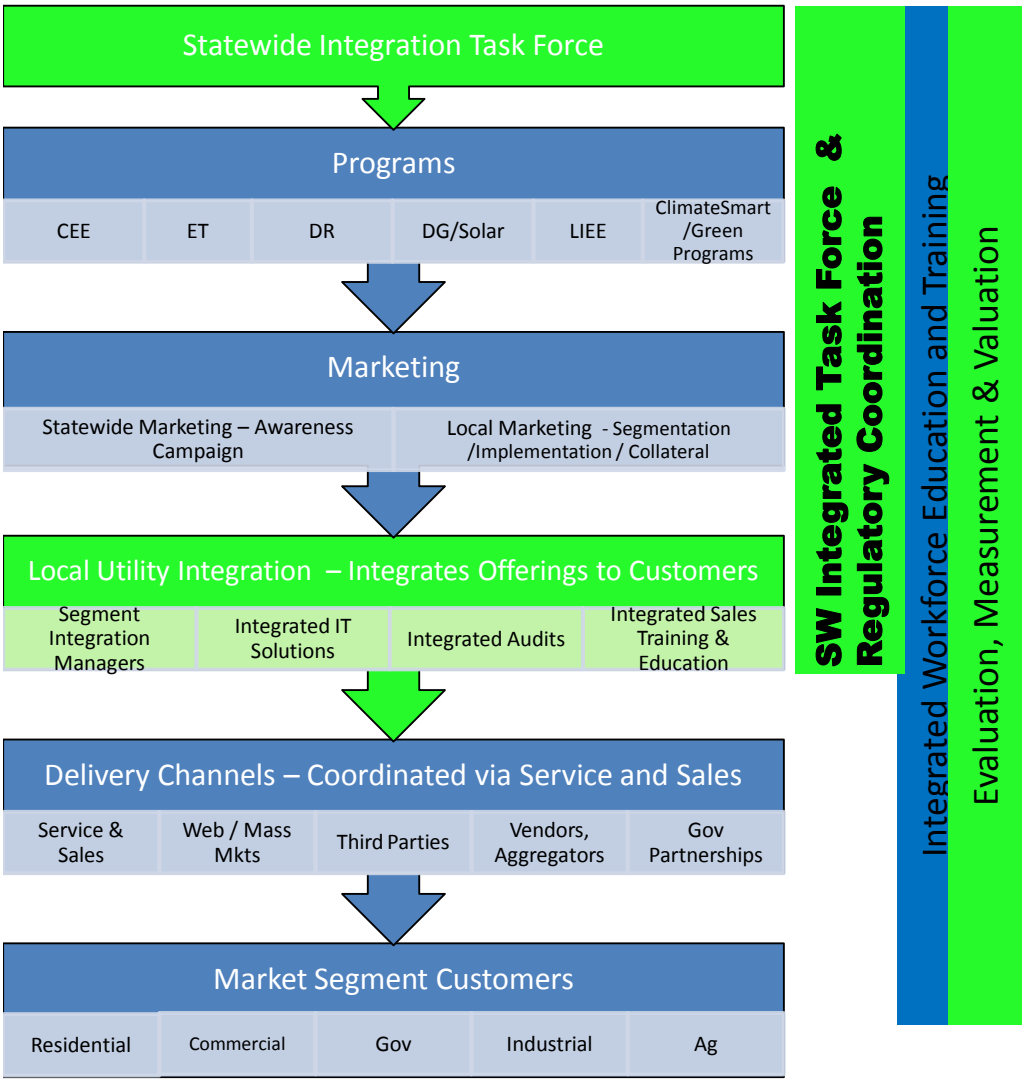
The Task Force will be the principal governance structure to track the integrated efforts of the IOUs and develop statewide metrics to evaluate their success. The Task Force will identify pilots, projects, programs and activities being conducted by individual IOUs that might be replicated in other parts of the state. As described in section 4.b.5, above, integrated pilots and activities will continue to be identified and tracked by the Task Force in quarterly reports. A critical component of evaluating these pilots, projects, and program activities is identifying what data should be captured to optimally evaluate the ongoing success of these pilots and IDSM activities. The Task Force will coordinate with ED staff to ensure that an adequate level of data is collected.

i) EM&V

The Task Force will continue tracking and measuring the metrics described in Section 5 of this PIP, leveraging evaluation studies and resources where appropriate. The IDSM Omnibus Process Evaluation is underway and will provide recommendations for overcoming barriers and improving future IDSM offerings. Subsequent evaluation needs will be determined at the conclusion of the Omnibus Evaluation.

**7) Diagram of Program**

# Program Diagram – IDSM Task Force



## 8) Program Logic Model

Note: On December 2, 2010, the Commission issued Resolution E-4385, approving Program Performance Metrics (PPMs) for Pacific Gas and Electric Company, Southern California Edison Company, Southern California Gas Company and San Diego Gas and Electric Company for 2010-2012 statewide energy efficiency programs and subprograms. In addition, this Resolution approved updated logic models for the statewide programs. Below is the approved logic model for the Integrated Demand Side Management Program.