2013 Joint IOUs
Workforce, Education & Training Program Annual Report

The Joint IOUs in compliance with D.09-09-047 submit this WE&T Program update to the Commission.

May 1, 2014
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Joint IOU Workforce Education & Training Program

The Statewide (SW) Investor Owned Utilities (IOUs) Workforce Education and Training (WE&T) Program works to: (1) educate and train the future energy efficiency (EE) workforce, (2) promote EE and integrate distributed generation (DG) and demand response (DR) knowledge and skills in the existing workforce, and (3) partner with other organizations to help develop job placement and promotion opportunities in the energy efficiency economy in order to meet California’s Long-Term Energy Efficiency Strategic Plan (Strategic Plan) goals. WE&T program work is implemented by Pacific Gas and Electric Company (PG&E), San Diego Gas & Electric (SDG&E), Southern California Edison (SCE), and Southern California Gas Company (SoCalGas) (collectively, the IOUs).

The SW WE&T Program includes three subprograms:

The **WE&T Centergies** Subprogram is made up of eight IOU Energy Centers targeting specific market segments, including agriculture, food service commercial, and residential sectors. Centergies focuses on skills building and market building trainings (such as classes that focus exclusively on end users rather than implementers), technical consultations, outreach events, and building performance tool loans. The Energy Centers focus on educational strategies and partnerships that result in high-road education and training development to provide the trained, knowledgeable workforce necessary to meet California’s EE, DG and DR goals.

The **WE&T Connections** Subprogram seeks to promote EE and energy/green sector career awareness along all educational paths (levels), from K-12 to post-secondary. Connections achieves its EE educational goals by working with community-based organizations (CBOs), state education agencies, and educational stakeholders to facilitate EE strategic planning and educational programming at all educational paths. The subprogram infuses the EE, DR, and relevant career messages through interactive curricula and educational materials, student assemblies, and teacher workshops. As appropriate, curricula and educational materials are correlated to the California Department of Education’s content standards.

The **WE&T Strategic Planning and Implementation** Subprogram provides the SW framework for planning, coordinating, and implementing WE&T activities and recommendations to meet the WE&T goals in the California Long-Term Energy Efficiency Strategic Plan (Strategic Plan). In addition, and as appropriate, this subprogram addresses the WE&T recommendations in the Needs Assessment for Energy Efficiency, Distributed Generation and Demand Response (Needs Assessment). Planning and implementation efforts include facilitating the transition of pilot programs at local and statewide level, managing and incorporating new and best practices, an monitoring and recalibrating efforts to ensure attainment of planned outcomes.
Overview of Statewide Program Activities

As directed by the Commission, the SW Planning and Implementation team hired a consultant to develop a comprehensive approach for WE&T to align with the Strategic Plan and the Needs Assessment as appropriate. Through a competitive solicitation, bidders were asked for their proposals to study, analyze, and make recommendations on WE&T areas such as market forecast, and accountability to disadvantaged communities. The consultant, the Don Vial Center on Employment in the Green Economy (DVC), is expected to deliver this comprehensive approach, referred to as the WE&T Strategy Guidance Plan (Guidance Plan) in 2014.

The SW Centergies Subprogram offered 1,420 class sessions, 817 technical consultations, and 393 outreaches. Specific to the budget allocation for class sessions, the IOUs spent approximately 45% on training workers on new or upgraded skills (implementer focused) and approximately 55% on market building (end user focused).

Since 2010, the IOUs have supported the training of 1,800 California Advanced Lighting Controls Training Program (CALCTP) certified electricians. Of these, 444 were certified in 2013.

The IOUs offered 83 Building Operator Certification (BOC®) training class sessions, including expansion of efforts targeting disadvantaged communities.

The SW Connections Subprogram surpassed its goal of enrolling participating students from low-income, inner city or urban, Title 1 schools by at least 10 percentage points. Further, between all seven SW and local Connections programs (e.g., PEAK and Energenius), the student participation target was far exceeded (See Statewide Connections Subprogram, herein).

Needs Assessment Highlights:

1. The IOUs, with input from the DVC and the Peer Review Group (PRG), developed a Sector Strategy definition, providing clarification on the direction of sector strategy efforts across WE&T subprograms and IOU resource programs, alike.
2. Statewide the WE&T Centergies Subprogram expanded its offerings of the Institute of Heating and Air-Conditioning Institute (IHACI) classes as well as comprehensive HVAC courses, including classes that support the Quality Maintenance (QM) program.
3. Through the DVC guidance document under development, the IOUs collaborated with the consultant and WE&T PRG stakeholders to develop an actionable framework for meeting the Strategic Plan goals and the Needs Assessment recommendations, as appropriate.

1 D.12-11-015, OP 34
**SDG&E Highlights**

1. The BOC® program offered training, including graduate mentors and job placement guidance, directed at unemployed veterans.
2. SDG&E incorporated program stakeholder feedback to strengthen skills development training focusing on residential contractors. This completed the successful transition all Energy Upgrade California (EUC) training, including Building Performance Institute coursework, to the WE&T Program.
3. SDG&E’s WE&T program was successful in facilitating implementation of First Source hiring practices and job tracking in third-party programs during 2013. SDG&E partners with the San Diego Workforce Partnership to implement First Source, which provides CBOs who serve the disadvantaged workforce advance notice of new job or internship opportunities.

**SCE Highlights**

1. In partnership with HVAC resource programs and HVACRedu, SCE implemented hands-on Advanced Digital Economizer (ADEC) certification, training qualified HVACR technicians on the programming and repair of digital economizers.
2. SCE developed new intermediate- and advanced-level Programmable Logic Controls (PLC) training workshops to enhance the Automation Academy.
3. SCE established a partnership agreement with the College of the Sequoias and the U.S. Green Building Council (USGBC) to integrate Centergies courses as requirements for its “Sustainability Skill Certificate” program.
4. SCE launched efforts to complete a comprehensive audit of workshops and seminars to identify opportunities to enhance the approach to Integrated Demand Side Management (IDSM) teaching (adult learning principles), technologies and building systems integration, and applicable rebate and incentive programs.

**SoCalGas Highlights**

1. SoCalGas partnered with several Tankless Water Heater Companies - Navien, Rinnai, and Noritz - to hold classes for plumbers, installers, and repairmen. SoCalGas showcased a Water Heating Demonstration Lab at the Energy Resource Center (ERC) at which water heating experts test equipment and associated delivery systems. More importantly, the lab is used by SoCalGas to hold hands-on seminars/training on water heating.
2. SoCalGas partnered with IHACI to offer the highly requested economizer module to its HVAC training series. The training exemplified a sector strategies outcome and addressed the request for more “hands on” training.
3. SoCalGas used its ERC to deliver a non-paid internship landscape/facilities maintenance opportunity to qualified Home Builders Institute (HBI) trainees. During their 4-6 week stay, the trainees learned how to maintain the “California-friendly” landscape, edible garden, and succulent landscape. They attained several landscaping skills and performed minimal facilities-related tasks: painting, assisting in seminar and meeting room setups and capabilities, and grounds cleaning.
PG&E Highlights

1. PG&E signed a contract agreement with the Center for Employment Training (CET) to offer classes integrated into CET’s disadvantaged workforce development programs, specifically with the California Division of Apprenticeship Standard (DAS) approved Electrician Training.

2. PG&E partnered with the Sheet Metal and Air Conditioning Contractors National Association (SMACNA) Bay Area Chapter to develop a journeymen training on the topic of Smart Grid.

3. WE&T connected two regionally-focused disadvantaged workforce development non-profits (Rising Sun’s and Proteus’s training), to PG&E’s Energy Savings Assistance (ESA) Program training. This connection allowed disadvantaged students to enter the ESA Program in a prequalified fashion, shortening the ESA series length. Shorter ESA training avoids training duplication—ESA can focus on high level energy efficiency and program requirements and the partners can focus on baseline skills and workforce development. Employers received an added benefit as; trainees spend less time in the classroom and therefore less time off the jobsite.

4. PG&E worked with the American Institute of Architects California Council (AIACC) to include energy performance criteria for all design award submittals. This is the first time, nationwide that a state AIA chapter has adopted energy as a standard criterion for all awards, not simply “green buildings”, indicating a significant attitude shift in the design market.

WE&T Program Implementation Plan (PIP) Target Update

Statewide Centergies Subprogram

WE&T Energy Centers

In 2013, the IOUs focused on meeting quantitative targets provided in their respective Program Implementation Plans (PIPs) while shifting their priorities toward specific parts of the Needs Assessment and WE&T Process Evaluation. Examples of these efforts included the expansion of skills building classes and increased number of IHACI and BOC® trainings.

The IOUs remained committed to compliance and achieving the goals originally set for 2013-2014 while developing additional offerings to improve the quality and qualifications of the green energy workforce, and increasing new pathways into energy efficiency careers, as described in the statewide and IOU highlights above. Training the workforce, educating workers through seminars on market and industry changes, and offering hands-on consultations, demonstrations, and presentations on equipment remained key near-term metrics for supporting quality installations and comprehensive solutions in energy efficient design.

The 2013 results for each of the IOUs, along with their PIP targets, are provided in the tables below:
### Pacific Gas and Electric Company

<table>
<thead>
<tr>
<th></th>
<th>Seminars</th>
<th>EE Consultations</th>
<th>Tool Loan Transactions/Loaned Tools</th>
<th>Outreach</th>
<th>Total Attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2013</strong></td>
<td>525</td>
<td>305</td>
<td>1,013/NA</td>
<td>123</td>
<td>11,213</td>
</tr>
<tr>
<td><strong>Goal</strong></td>
<td>401</td>
<td>180</td>
<td>820/NA</td>
<td>92</td>
<td>NA</td>
</tr>
</tbody>
</table>

### San Diego Gas & Electric Company

<table>
<thead>
<tr>
<th></th>
<th>Seminars</th>
<th>EE Consultations</th>
<th>Tool Loan Transactions/Loaned Tools</th>
<th>Outreach</th>
<th>Total Attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2013</strong></td>
<td>197</td>
<td>149</td>
<td>115/NA</td>
<td>302</td>
<td>30,704</td>
</tr>
<tr>
<td><strong>Goal</strong></td>
<td>150</td>
<td>100</td>
<td>NA</td>
<td>50</td>
<td>NA</td>
</tr>
</tbody>
</table>

### Southern California Edison Company

<table>
<thead>
<tr>
<th></th>
<th>Seminars</th>
<th>EE Consultations</th>
<th>Tool Loan Transactions/Loaned Tools</th>
<th>Outreach</th>
<th>Total Attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2013</strong></td>
<td>393</td>
<td>164</td>
<td>236/408</td>
<td>238*</td>
<td>11,027</td>
</tr>
<tr>
<td><strong>Goal</strong></td>
<td>290</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

* In 2011, SCE defined outreach as where SCE Energy Education Center staff presented at or attended an event to promote the Centers. In 2012, SCE’s definition also included group visits and tours.

### Southern California Gas Company

<table>
<thead>
<tr>
<th></th>
<th>Seminars</th>
<th>EE Consultations</th>
<th>Tool Loan Transactions/Loaned Tools</th>
<th>Outreach</th>
<th>Total Attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2013</strong></td>
<td>222</td>
<td>199*</td>
<td>NA</td>
<td>47</td>
<td>14,586</td>
</tr>
<tr>
<td><strong>Goal</strong></td>
<td>125</td>
<td>220</td>
<td>NA</td>
<td>40</td>
<td>NA</td>
</tr>
</tbody>
</table>

*Includes 7 equipment certifications

### Statewide Building Operator Certification (BOC®) Program

Building Operator Certification (BOC®) is a nationally recognized, competency-based training and certification program that offers facilities personnel the improved job skills and knowledge
to transform workplaces to be more comfortable, energy efficient, and environmentally friendly. Employers have demonstrated high levels of support by sending their employees to BOC® class series and some employers require BOC® certification as part of their hiring criteria. To date, BOC® has offered 166 BOC® Level I and II courses statewide. In 2013, 83 BOC® trainings were offered to commercial building operators, engineers, and facility managers. The IOUs met their PIP goals and offered nine Level 1 courses and five Level 2 courses, with a total of 297 registrants. Of participants in BOC® Level 1 trainings, 59 percent of the students passed the Level 1 certification exam. BOC® Level 2 trainings, which included fewer students and increasingly more technical material, certified 35 percent of participants. This decrease in percentage from Level 1 certifications to Level 2 certifications indicates the complexity and difficulty of the higher level material. BOC® also continued its four-part technical web-based series in 2013, as advised by Opinion Dynamics Corporation (ODC) in the 2010-2012 Process Evaluation.

In 2013 BOC® and WE&T participated in the 2013 Impact Evaluation Report by ODC. The section on Evaluation of Workforce Outcomes provides more information on the evaluation findings.

PG&E led efforts to improve the BOC® Program to better reflect California best practices. In turn, the IOUs discussed approaches to better integrating BOC® best practices into IOU curricula. Beyond general best practices, these curricula modifications material included operating zero net energy (ZNE) buildings, continuous energy use monitoring, as well as diagnostic and troubleshooting strategies.

Building on a 2012 pilot project between BOC®, PG&E and the Alameda Workforce Investment Board, BOC® trained 15 unemployed veterans during 2013, in partnership with SDG&E, California Employment Development Department (EDD), CB Richard Ellis, and California State University, San Marcos. Nine veterans graduated and earned their certificate of completion and two entered part-time employment during the training phase. Out of the six students who did not complete the BOC® training, two entered employment and one entered a post-secondary education program. The veteran participants will continue to receive job search assistance through the Employment Development Department (EDD).

The BOC® program is designed around working with incumbent workers. As such, employer commitment is necessary to allow students to attend and participate in classes. In 2013, a large variety of employers supported their employees in receiving BOC® training. The breakdown by employer type is as follows:

<table>
<thead>
<tr>
<th>Employer Type</th>
<th>Percent of total 2013 BOC® attendees by employer type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community College</td>
<td>22%</td>
</tr>
<tr>
<td>Property Management</td>
<td>18%</td>
</tr>
<tr>
<td>Government (city/county)</td>
<td>15%</td>
</tr>
<tr>
<td>Other</td>
<td>10%</td>
</tr>
<tr>
<td>College/University</td>
<td>8%</td>
</tr>
</tbody>
</table>
Participating employees represented organizations such as Raytheon Corporation, Chevron and University of California, City of Brea, and the San Bernardino Unified School District.

**Statewide Connections Subprogram**

The K-12 sector programs — Energenius, Green 360, LivingWise®, PEAK, and PowerSave Schools -- not only met their student outreach target, but also their Low Income, Inner City or Urban, Title 1 target, Teacher Training target, and Outreach and Green Career targets. In response to the Needs Assessment, the programs enhanced their green career offerings. PG&E’s Green 360 program added a standalone version of their career profile, which increased the reach to a broader audience of students in underserved communities to include middle school, community college, and CBO employees. All programs also included IDSM concepts and activities. It is worth noting the statewide PEAK program was selected as one of the youth coordinators for the 2013 Department Of Education’s (DOE) Solar Decathlon’s XPO Exhibit hosted in Southern California. The exhibit engaged young visitors in a myriad of energy-focused activities, including a special PEAK theatrical production that taught about demand response concepts and behaviors.

The Community College sector program, Developing Energy Efficiency Professionals (DEEP), kicked-off its second year of implementation in April. Through year end, program management outreached to past participants and new colleges, enrolling one new college². Two other colleges nearly completed the enrollment process in 2013 and are on schedule for enrollment by mid-2014.

The University sector program, PowerSave Campus (formerly Green Campus), continued its presence in 16 universities across the state and had over 75 participating paid interns. Intern activities outreached (directly and indirectly) to 463,531 students, staff, and community members through a total of 215 outreach and 37 workforce events state-wide. Examples of workforce events include career panels, job fairs, and hands-on trainings. In 2013, the IOUs, in collaboration with the program vendor, started development of a sustainability plan. This sustainability plan proposes a model by which longer tenured campuses can continue PowerSave Campus activities at a reduced level of support from the program’s vendor, freeing funding for outreach to new campuses.

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² The four-month hiatus, prompted by vendor contractual matters, resulted in the three 2012 participating colleges dropping out of the program.
Moreover, PowerSave Campus interns collaborated with a total of 58 faculty/curriculum developers on academic infusion initiatives, including some focused on IDSM. And, as indicated in the Connections PIP, two campuses inventoried their campuses course offering to identify and promote energy and sustainability related courses at their campuses. Lastly, the program was recognized as the 2013 California Internship & Work Experience Association’s (CIWEA) Employer of the Year.

Below is a summary of 2013 program target results for the Connections Subprogram.

<table>
<thead>
<tr>
<th>Program Name</th>
<th>Program Target 2013</th>
<th>2013 Results</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>University Sector</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PowerSave Campus (Statewide)(formerly Green Campus)</td>
<td>14-16 campuses</td>
<td>16 campuses</td>
</tr>
<tr>
<td><strong>Community College Sector</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DEEP (SCE)</td>
<td>3 campuses</td>
<td>1 campus (see footnote 2 on page 8)</td>
</tr>
<tr>
<td><strong>K-12 Sector</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PEAK (Statewide)</td>
<td>18,000 students</td>
<td>26,633 students</td>
</tr>
<tr>
<td>Energenius (PG&amp;E)</td>
<td>60,000 students</td>
<td>74,360 students</td>
</tr>
<tr>
<td>Green 360 (PG&amp;E)</td>
<td>1,000 Online Course/Community Participants</td>
<td>2,400 participants</td>
</tr>
<tr>
<td>LivingWise (SoCalGas, SCE)</td>
<td>20,000-30,000 students</td>
<td>35,885 students</td>
</tr>
<tr>
<td>PowerSave Schools (SCE) (formerly Green Schools)</td>
<td>25,000 students</td>
<td>25,520 students</td>
</tr>
</tbody>
</table>

As with these PIP results, the subprogram also made notable advances on other activities identified in the 2013-2014 WE&T PIP and the recommendations from the Needs Assessment. Among these notable efforts were the planning and development of an energy education sector strategy and the increased emphasis on career development and environment integration in the K-12 curricula.

In the first three months of the year, with the advice and collaboration of an IOUs-assembled team of 80 plus education-related partners, the team focused on two core activities. The section on Support for Sector Strategies elaborates on the activities and progress.
As identified in the Needs Assessment, the Connections team worked with its K-12 program implementers to increase emphasis on career development and environment integration. Additional information on the progress through year-end is provided in the sections Collaborate with Educators and Career Education. These sections also provide updates on other activities engaged by the subprogram.

**Needs Assessment Recommendations Update**

In 2011, the WE&T Needs Assessment outlined a number of areas where the IOUs should focus efforts to more effectively meet the workforce development needs of the Strategic Plan. Specifically the Needs Assessment focused on workforce development with the construction trades: inclusion of disadvantaged communities; and sector strategy efforts to better align market, employer, and policy goals with worker trainings. In 2013, the IOUs continued updating its efforts in alignment with the Needs Assessment, as well as strengthening existing programs currently in alignment with the Needs Assessment as explained below.

**Support Sector Strategies**

In 2013, the IOUs began to develop a comprehensive approach to their sector strategies based on guidance from Energy Division and lessons learned from 2012 sector strategy efforts. These initial efforts were further informed by a sector strategy definition outlined by the IOUs. The IOUs worked with the PRG to help inform their initial sector strategy efforts leading to this overview.

While under development, planning, and implementation of specific potential strategies continued in parallel. Some efforts may have statewide potential:

- **Energy Workforce Sector Strategy**: This strategy expanded to become the umbrella approach for all current and future commercial building sector strategies. Development and implementation of several classes took place in partnership with the IOUs and community colleges.
- **California Advanced Lighting Controls Training Program (CALCTP)**: The IOUs worked to ensure the sustainability of CALCTP through support with program implementation, training (at both IOU energy center and external partner facilities) and a resource program effort exploring incentive approaches to CALCTP.
- **Architecture**: WE&T began work with the AIACC to test a hybrid on-demand/in person high performance building enclosure skills training course slated to go statewide in 2014. Additionally, due in part to IOU partnership work, the AIACC agreed to include energy performance as criteria in selecting its design award winners. Discussions are underway for a statewide summit for all stakeholders on Energy and the Architecture profession for 2014.
- **Small and Medium Business Auditing and Commissioning**: The IOUs directed and advised various community colleges on the development of new auditing and commissioning classes and coursework. In 2013, the commissioning class graduated its first class with self-reported energy savings of 1,000,000 kWh and 150,000 therms.
• **Building Operator Certification:** The IOUs continued to support BOC® credential training in 2013 (see BOC® section above for more detail on program highlights).

• **HVAC:** The IOUs met with members of Energy Division, Labor, and HVAC sector experts to explore specific opportunities in the commercial sector and selected a focus area. As new data regarding the savings potential of the focus area became available in late 2013, the HVAC sector strategy stakeholder team chose to reevaluate their focus area. This resulted in more robust engagement with the Western HVAC Performance Alliance (WHPA) as the team started the development of a statewide training going forward into 2014.

• **Automation Academy:** A multi-utility effort with PG&E focusing on PLC and their application in markets such as manufacturing, processing, logistics and others. The curriculum is designed to meet specific market needs and provide for future certification. In 2013, the IOUs developed new intermediate- and advanced-level PLC training workshops to enhance the Automation Academy.

• **Energy Education:** This strategy aims to round up energy education resources to support (1) the integration of IDSM and career awareness content into existing K-12 programs, curriculum, and resources and (2) the creation and expansion of partnerships with California Partnership Academies (CPAs), Regional Occupational Programs (ROPs) and other similar career-based technical institutions. Through the end of 2013, the team identified resources and started development on an outreach plan.

The IOUs are in the process of taking the lessons learned from these initial efforts to inform future efforts. Where appropriate, the IOUs will continue to build upon these efforts and ensure alignment with the sector strategy definition and process agreed upon in late 2013, as well as the forthcoming strategy recommendations from the DVC.

**Collaborate with Construction Trades**

The IOUs have collaborated to review and determine potential statewide benefits in existing local partnerships to achieve further alignment with strategic objectives and recommendations in the Needs Assessment study.

Regionally focused efforts are intended to meet the local needs and serve as incubators for potential future statewide efforts. As an example, SoCalGas teamed with manufacturers, distributors and industry trade involved with delivering advanced water heating technologies to confer about curriculum and training to take advantage of its newly created water Heating Demonstration lab. Partnering with Navien, Rinnai, and Noritz, SoCalGas held classes for plumbers, installers, and repairmen. PG&E signed a contract with the Center for Employment Training (CET), a statewide non-profit technical training organization serving disadvantaged communities. Initial work with the CET focused on integrating current Centergies trainings to supplement the DAS Standards recognized pre-apprenticeship Electrician curriculum. In conjunction with the Sheet Metal and Air Conditioning Contractors National Association (SMACNA), Bay Area Chapter, the PG&E Energy Centers were developing journeymen training on EE, DR and IOU programs and rebates. SCE, in partnership with HVAC resource programs and industry’s HVACRedu, implemented hands-on Advanced Digital Economizer
(ADEC) certification, training qualified HVACR technicians on the programming and repair of digital economizers.

The IOUs examined ways to gradually integrate standards curriculum in a consistent manner into training seminars that educate major EE workforce groups, such as architects, builders, contractors, and construction workers. The goal is to improve energy efficient practices among these groups, rather than solely making trade industry relationships. Noting additional stakeholder input on IOU plans with trade group relationships, the IOUs will look at ways to grow relationships to allow for quick access to curricula or accelerated curriculum development.

**Support Credentials and Certifications**

The IOUs made further progress in their coordination efforts to identify subject matter areas where approaches and concepts could be expanded or duplicated at the respective utilities. The HVAC industry was a targeted area, because of the potential to greatly impact energy efficiency in this sector. Existing work with BOC®, CALCTP certifications, and expansion into other certifications continued in support of these efforts.

Centergies’ credentialing and certification offerings are dependent on third-party industry workgroups and standards setting entities. The IOUs continued to offer various courses that lead to certifications and complement current third-party certification and continuing education programs.

The IOUs began consideration of consolidation of certification/credentialing as the programs assessed the adequateness of a given certifications. The IOUs ultimately would prefer to use approved industry standards to offer consistent quality in the statewide curricula; in many cases, however, no such industry recognized standards exist.

The certification programs, continuing education, and/or partners include:

- Building Operator Certification (BOC®)
- North American Training Excellence (NATE)
- National Association of the Remodeling Industry (NARI)
- Bureau of Real Estate Appraisers (BREA)
- Bureau of Real Estate (BRE)
- BuildIt Green (BIG)
- California Advanced Lighting & Controls Training Program (CALCTP)
- Home Energy Raters Training (Residential Energy Services Network (ResNET), CalCerts, ConSol Home Energy Efficiency Rating Services (CHEERS)
- American Institute of Architects (AIA) - local chapters and statewide through AIA California Council
- Green Building Certification Institute (GBCI) - LEED prep/certification courses and continuing education
- Institute of Heating & Air Conditioning Industries (IHACI) – Quality Improvement/Quality Maintenance (QI/QM)
Restructure Classes

The IOUs and Sacramento Municipal Utility District WE&T staff met in the first statewide “all staff” WE&T meeting to prioritize and organize restructuring efforts. The meeting was organized around working sessions focusing on specific Needs Assessment and ODC Process Evaluation recommendations including online learning, diversity and inclusion, and prioritized training assessments for: HVAC QI and QM, Codes and Standards, ZNE, and automation systems among others. The purpose of the working sessions was to start statewide restructuring efforts in a coordinated fashion.

The IHACI training series continued to be offered statewide and were incorporated along with other standards as part of the Statewide Commercial HVAC Quality Maintenance program.

The IOUs continued to develop series of classes with industry including a hybrid On-demand/In person skills session with the AIA California Council, piloted in 2013 and scheduled to go statewide in 2014. Additionally the IOUs offered a ZNE Residential Retrofit and a ZNE Residential New Construction classes series statewide focused on skills for designers and builders in support of the Strategic Plan. Late in 2013, SoCalGas added several new classes for 2014 related to ZNE classes, bringing instructors from PG&E to teach a ZNE class at both SDG&E and The Energy Resource Center. Additionally SDG&E, PG&E, and Sacramento Municipal Utility District (SMUD) co-developed a four part ZNE Residential Retrofit series and offered it across the state in 2013.

In compliance with the 2013-2014 PIP, the IOU Training Centers continued to work with the statewide Codes and Standards Program (C&S) team to offer the “Standards Essentials” trainings. These trainings support the Certified Energy Analyst and Certified Plans Examiner certifications sponsored by the statewide C&S Program.

The Energy Centers focused on portfolio strategies with the intention of elevating the skills-building education provided by IOU WE&T programs. The IOUs continued to investigate and expand industry-credible certifications and continuing education credits including BPI, NATE, NARI, BREA, BIG, NCQLP, GBCI and FSCI (See Support Credentials and Certifications above). Additionally, HVAC training addressing the Needs Assessment suggestion of more “hands on” training was addressed through the fact that module 4 of the 4 part series is dedicated solely to hands-on training utilizing mock-ups of various economizers found in the field. The models allow instructors to present various scenarios the participants will encounter on a daily basis.

Initial work in 2013 by SCE to develop a platform for on-demand and online class work has resulted in PG&E agreeing to share the platform and exchange course content across utilities.
The goal for this online training platform is to provide consistent statewide messaging on products, programs and trainings as appropriate, while reaching more customers in a cost effective manner.

Multiple IOUs focused efforts on including Learning Objectives for their course as directed by the Needs Assessment. The IOUs looked to include a greater amount of Adult Learning principles in their coursework. Specific effort at PG&E included working with two Adult Learning consultants on best practices and SDG&E working with WE&T instructors, and targeting new and existing courses to incorporate adult learning principles. Instructors enhanced their curricula to engage participants in exploring new ideas, solving problems, and checking their understanding of information and concepts presented in class. In addition, IOUs reviewed their course material to support WE&T goals and IOU resource programs.

**Support Curricula Development**

In 2013, the IOUs continued to develop and expand workforce development training opportunities to increase skills building activities in occupations identified by the Needs Assessment, including with the trades through IHACI, CET and NATE and with professionals through the AIA. In collaboration with various commercial and residential trades, and while supporting certifications and credential programs and targeting the disadvantaged workforce where possible, the result was an average of 45 percent of statewide WE&T budgets supporting skills building training in these occupations.

The IOUs continued partnerships with organizations such as CalCERTS, California Builders Performance Contractors Association (CBPCA), Conservation Service Group (CSG) and CHEERS to host their member trainings to assure opportunities are being provided statewide. Likewise, the IOUs continued to partner with IHACI to deliver series of courses designed to teach the participants comprehensive skill sets required to understand and evaluate whole HVAC systems, with a focus on QI/QM. These skill sets train contractors to install and service HVAC systems that are safe, reliable, and operate at the highest capacity and as energy efficient as possible. Further, the IOUs, in conjunction with IHACI, co-sponsored a series of seminars specifically designed to help participants prepare for successfully completing the NATE Certification Exam. For the convenience of working professionals, these classes were offered during non-business hours (weekday evenings) followed by the exam on a Saturday. The IOUs also explored new HVAC technician training opportunities, leveraging existing partnerships with HVACRedu to expand online-only and online/hands-on blended offerings focusing on QI/QM for ADEC.

The IOUs partnered with California Community Colleges (CCCs) in 2013 to establish articulation agreements to enhance workforce development training in core educational pathways. Also in 2013, the IOUs engaged in discussions with the CCCs Chancellor’s Office Energy and Utilities Sector Navigator to update relevant trade curricula to 2013 Title 24 updates. The outcomes of this partnership are expected to be scalable to CCCs throughout IOU service territories. The CCCs partnerships are expected to formalize in 2014.
The IOUs also focused on IDSM curricula integration and enhancements: (1) developed seminars and exhibits focused on DG, EE, and DR; (2) evaluated current curricula to identify opportunities to enhance their IDSM potential; and (3) worked with IOU specific DSM resource program groups to develop IDSM training in a way that is consistent with other IOU offerings. In an effort to improve the quality of the curriculum and seek stronger DSM integration, the IOUs worked collaboratively to complete a comprehensive audit of workshops and seminars to identify opportunities to enhance the approach to IDSM teaching (adult learning principles), technologies and building systems integration, applicable rebate and incentive programs, and reporting. Specifically, the IOUs worked to develop offerings with the resource program teams. These efforts will continue through 2014.

**Inclusion of Disadvantaged Workers**

The Centergies Subprogram continued collaborations with organizations representing and serving military veterans, low-income communities, at-risk youths/adults, and minority (under-represented) populations. The IOUs continued to make progress in working with local CBOs such as the CET, Rising Sun Energy Center, Proteus, and the Frontier Project, to leverage existing pathways to low-income and disadvantaged populations, while in some cases establishing articulation agreements to integrate WE&T and Energy Savings Assistance (ESA) Program offerings. In the case of IOU partnerships with the CET, WE&T programs have integrated applicable EE offerings into the DAS Standard recognized Electrician Training. WE&T staff serve on multiple curriculum and industrial advisory panels in support of these partnerships as well.

These partnerships also provided opportunities for the statewide Centergies programs to share IDSM resource program and training opportunities. The IOUs leveraged their existing training, such as weatherization and solar maintenance and installation programs to enhance the programs offered by CBOs, certified energy organizations, and non-profits. Activities such as customer forums, conferences, expositions, and lunch-and-learns were offered so that low-income and disadvantaged populations can participate in facility tours, seminars, consultations and demonstrations, and the Tool Lending Library. The IOUs will also continue to collaborate and expand partnerships with programs such as First Source language, which provides CBOs serving disadvantaged populations with job postings before release to the general public.

**Evaluation of Workforce Outcomes**

The IOU Evaluation, Measurement and Verification. (EM&V) teams took on several initiatives in 2013, detailed below:
- Centergies Program Theory and Logic Model Revision
- EM&V Response to EE Decision Data Collection Directive
- Evaluation of BOC®
**WE&T Centergies Program Theory and Logic Model Revision**

In 2013, the four IOU EM&V teams jointly completed a study with ODC. The study conducted a thorough revision of the Centergies program theory and logic model and potential success indicators, and recommended program data collection and tracking changes for the 2013-2014 WE&T Centergies program. The WE&T Program Theory and Logic Model was updated and is being finalized for all IOUs in California because of the redirection of WE&T requested by the Strategic Plan and the Needs Assessment. While these documents have not required WE&T to stop providing their traditional services, new objectives have been added to the old. The IOUs have been re-orienting themselves to include new objectives that focus on workforce training toward developing a green workforce capable of supporting the Strategic Plan goals, and toward bringing disadvantaged workers into that workforce. In addition, the updating of the Program Theory and Logic Model facilitated the generation and selection of new success indicators that are based on new needs and demands.

The study team reviewed Centergies current data collection efforts in light of what Centergies needs to collect as evidentiary support for its Theory and Logic and identified opportunities to improve data systems and tracking to better support the Theory. As such, the study provided a number of suggestions for how the IOUs can collectively improve data tracking and collection efforts in support of its Theory and Logic. Details of the suggestions made in this area are being finalized in ODC’s evaluation report, scheduled to be published in 2014.

**Decision Response Investigation**

The 2013-2014 WE&T research roadmap references two decisions (D.12-11-015 and D.12-08-0443) which requested the WE&T program start assessing all costs and benefits associated with certification and skill requirements and to begin collecting labor data from contractors such as pay scales and benefits. The WE&T roadmap called for the IOUs to initiate a study to explore these decisions, how the IOUs have responded to the decisions thus far, and what options they might have for responding to them in the future. The study team found that some effort is already under way:

- EM&V effort to explore the costs and benefits associated with the quality installation training requirement for SCE’s QI Residential HVAC program and CALCTP
- PY10-12 Residential and Small Commercial HVAC Impact Evaluation by DNV-KEMA
- HVAC Market Effects Study by NMR Group

Further, there is one planned study, HVAC Contractor & Technician Behavior Phase II, to be released in the fourth quarter of 2014, in the Residential HVAC roadmap that appears to be focused on specifically addressing the EE Decision as its research objectives are “to further [understanding the] opportunities and challenges surrounding HVAC contractor and technician behavior. Quality Installation Skills Standards – estimate impacts of program requirements for

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\(^2\) D.12-11-015, OP 35
skill standards that promote technician certifications on program participation rates as well as potential incremental costs and benefits for customers.”

There is still research to be done to determine the overall costs and benefits of CALCTP lighting installations compared to non-CALCTP installations. Currently there is one EM&V-funded statewide lighting control training and certification assessment planned in this area over the next few years. In addition, the SCE and PG&E Lighting Program teams are likely to initiate CALCTP/lighting control studies in the 2013-2015 cycle.

The ODC report will be finalized in 2014.

Building Operator Certification Program Evaluation

In 2013, ODC conducted an Evaluation of the California Statewide BOC® Program with 2010-2012 participants. The purpose of the evaluation was to better understand savings and whether there were methods that would allow for a higher level of rigor when estimating savings from training programs. Detailed findings are provided in the ODC evaluation report. A few key findings were:

- 80% of all BOC® program participants who become BOC® certified are in a position to save energy, because they directly manage a facility or conduct maintenance operations. Other participants included students, unemployed participants (some who have switched careers since the training), and others in maintenance-related positions such as plumbers.
- Participant comments and responses demonstrated the value of the BOC® program with more than half (58%) of participants stating that they took some energy-saving action post-program.
- In total, 543 people participated in the BOC® program and received certification for building operation between 2010 and 2012. The savings from these participants’ facilities totaled approximately 17.4 GWh, 2.43 MW, and 285,000 therms in net impacts per year.
- The BOC® program resulted in an average per-student net savings of 32 MWh/year, 4.5 kW/year, and 525 therms/year. Given some study limitations (site accessibility, non-response bias, and timing) the savings are most likely underestimated.
- Program influence on savings is high. Similar to resource acquisition programs, slightly over two thirds of actions occurred due to BOC® training.

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4 Posted on Basecamp: “CA HVAC Contractor & Technician Behavior Phase II Study” Work Plan by Energy Market Innovations – April 17, 2014 P.4
• Only 12 of 392 actions taken by BOC® respondents (3.1%) were also found in the database of 2010-2012 EE paid measures. If this minimal amount of channeling is true then the BOC® program may be inducing more direct savings that are not accounted for in other programs than previously thought.

**Collaborate with Education**

In 2013, the IOUs continued collaborations with elementary, secondary, and post-secondary educational partners, to enhance the Connections and Centergies programs’ energy education efforts. Partners supported various areas, including 2013’s increased focus on curriculum enhancements to (1) emphasize K-12 career awareness, exploration, and preparation (as age appropriate) and (2) IDSM concepts and activities. In addition, the energy education sector strategies efforts were supported through the collaboration of an IOU-assembled team of over 80 education-related partners.

**K-12**

Efforts to emphasize K-12 energy/green sector career development resulted in:

- Career exploration modules added to the PEAK and PowerSave Schools programs.
- Enhancements to existing LivingWise career sections.
- Green 360 launched the Career Catalyst, a stand-alone “greened” career profile tool that helps students – in middle school through college - to identify their best fit careers. The Catalyst facilitates a cross-walk of green career futures within any subject area. The Energenius program will also be linking participating middle schools to the Career Catalyst, a stand-alone version of the career profile added to the Green 360 program. The Energenius program will also be linking participating middle schools to the career catalyst.
- The Energenius program is developing an Energy Sources and the Environment program for 6th graders.

As a result of the 2010-2012 Connections process evaluation, action steps for a more robust and evident IDSM integration were identified to best help participants understand the various loading order components (conservation, EE, DR, etc.) and their energy savings, energy resources, and environmental impacts. With this effort, K-12 curricula was enhanced with (1) a Water and Energy Nexus module and a Solar activity (PEAK); (2) a peak demand activity using watt meter to learn how much power equipment and appliances draw (LivingWise, PowerSave Schools); (3) an activity to design a net zero aircraft (PEAK); and (4) IDSM- and career-focused school assemblies (PowerSave Schools).

In an effort to increase outreach to low-income, inner city or urban, Title 1 schools, the IOUs partnered with: California Head Start, CDE after school programs, the County Office of Education, and several CBOs. The IOUs also continued to identify and develop new educational partnerships, such as the California Partnership Academies (CPAs) and other high school organizations to introduce them to available resources to facilitate wider energy education implementation.
Community Colleges

The Community College system was supported by the SCE-funded DEEP. This student-drive program collaborates with campus partners to deliver IDSM outreach, energy/green sector career activities, and hands-on engagement (mostly with campus facility partners in energy related projects).

Universities

The University of California (UC) and California State University (CSU) systems were supported by the IOU-funded, statewide PowerSave Campus program. This year, the program was implemented at 16 universities and employed over 75 interns. Interns and their partners engaged in projects and activities to influence energy and IDSM academic infusion, deliver outreach activities, build pathways to green careers, and realize measurable energy savings. A few 2013 activities included a forum for faculty to share ideas for integration of IDSM curricula into their academic courses, IDSM outreach through educational campaigns, career/job training events, and working with their campus facility managers to identify potential and actual energy saving opportunities.

PG&E worked with a local college architecture program to investigate adding formal, regular technical reviews to student architectural projects. This effort is innovative in that students of architecture have had little exposure to engineering professionals before they enter practice. PG&E Energy Center staff helps organize this effort and participates in reviewing student work. This review process provides a strong base and complement to Architecture Faculty who may not specialize in technical subject matters. PG&E has begun discussions to encourage participation with other university Architecture programs.

In mid-2013, the Connections Subprogram began evaluation of a new partnership with the CSU, Chancellors’ Office, Center for Community Engagement (CO CCE)’s “Campus as a Living Lab” initiative. SCE and SoCalGas had partnered with the CO CCE on this initiative for the 2012-2013 academic year. This initiative is a unique opportunity to partner faculty and facilities management staff in using the campus as a forum for the exploration of sustainability concepts and theories. The program aligns the CSU’s long-standing commitment to sustainability with the fundamental goal of preparing students for the workforce. While goal alignment is to be discussed in early 2014 and the partnership needs to be formalized, this is a promising opportunity for 2014.

Career Education

In 2013, the IOUs continued to identify, leverage, and track partnerships and collaborations supporting the incorporation of career education into K-12, community college, and university level education.

For the K-12 level, these efforts included the IOUs and their funded program partners working directly with local high school students to emphasize energy/green sector careers, personal career
paths, and recognition of alternate career options (such as trade/technical schools). Examples of resulting activities were mentoring engagements, high school career day activities, Youth Education Motivation Program, and Junior Achievement events. Such career education partnerships and collaborations resulted in all IOUs adding or supplementing, age-appropriate career awareness, exploration, and preparation materials to all curriculum, content-based IOU-funded programs, such as Energenius, Green 360 (formerly Green Pathways), LivingWise, PEAK, and PowerSave Schools.

Notably, in 2013:

- Energenius integrated career awareness and exploration information and activities for different grade levels as appropriate throughout pre K–middle school programs.
- Green 360 expanded outreach to include CBO youth programs, After School programs, Community Colleges, and Middle Schools and engaged 37 Green Gurus and six Career Coaches who share career information in the Green 360 Online Community. The statewide PEAK program’s Career Explorer packet and various fun and innovative approaches advanced the IOUs’ message on the what, why, and how of green careers. Further, it added Career Exploration modules and updated student assemblies to include an energy/green sector career interactive component.
- PowerSave Schools program added a career section to all of its lessons.
- SCE and SoCalGas engaged with the Applied Technology Center, a pathways school in the Montebello Unified School District, to provide student mentoring through the nationally recognized Architecture, Construction, Engineering Architecture, Construction, and Engineering (ACE) Mentor Program and through a local program focused on college preparation. The two IOUs intend to better-understand the educational system as well as the relevance, value, and scalability of these preparatory mentoring services to grade 9-12 students.

Beyond K-12, IOUs’ efforts are reaching other education and training market actors such as Green Academies, CTE’s, and/or Regional Occupational Center Programs (ROCP). Efforts that stand out include: (1) compiled contact information for the ROCP programs and energy-related academies, (2) a Green Resource guide for teachers and career counselors, and (3) a speaker bureau body to present environmental, EE and career awareness topics to disadvantaged high school students.

As mentioned in the Collaborate with Education section, the IOUs also continued to identify and develop new educational partnerships with the California Partnership Academies (CPAs) and other high school organizations introducing them to resources facilitating wider energy education implementation.

At the university level, all 16 PowerSave Campuses met their workforce events goals of two events per year. Also related to career education is the impact and influence the PowerSave Campus program has on its interns to pursue green careers. In 2013, results from the Campus Alumni Survey (a tool for tracking alumni’s career and academic status), indicated 63 percent (52 of 82 respondents) are working in the sustainability field.