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Southern California Edison Energy Efficiency Business Plan

Cross-Cutting: Workforce Education and Training Sector

DRAFT October 28, 2016

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I. Overview: Supporting California's Long-Term EE Strategic Plans

Workforce Education & Training (WE&T) is a cross-cutting program that delivers educational offerings, tools, and other resources in an effort to equip the California energy efficiency (EE) workforce with the knowledge to recognize EE opportunities, and the skills to act upon those opportunities. WE&T provides education and training for current and future workers to perform the work needed to reach California's clean energy goals. During the next several years, SCE, in coordination, with the other IOU program administrators will continue to support the California Long Term Energy Efficiency Strategic Plan's (CALTEESP) vision for Utility Workforce Education and Training programs:

"By 2020, California's workforce is trained and fully engaged to provide the human capital necessary to achieve California's economic energy efficiency and demand-side management potential."¹

A. Cross-Cutting WE&T Program Offerings

WE&T program offerings span multiple sectors and customer end-uses. They are provided through a range of delivery methods including in-person workshops, demonstrations, evaluations, webinars, online and on-demand training, educational series and pathways to industry-recognized certification programs. Courses are offered in sub-sectors such as Heating, Ventilation, Air Conditioning and Refrigeration (HVACR), Lighting and Controls, Codes & Standards, Building Performance, and SCE's Rebate & Incentive Programs. A variety of other educational offerings supplement portfolio of workshops and seminars, such as building performance tool loans through the statewide Tool Lending Library, EE and emerging technologies equipment demonstrations, project consultations by industry subject matter experts, and on-site tours of SCE's Energy Education Centers in Irwindale and Tulare.

B. EE Workforce Opportunities

The WE&T Program promotes EE workforce opportunities across customer segments. WE&T also supports market penetration by disseminating information about efficient technologies and practices to electric, natural gas, and water utility customers and providing services to a variety of midstream and upstream market actors (e.g., architects, engineers, distributors, technicians, and contractors) who use information and tools to design more efficient buildings and processes, and to conduct efficient energy and water system retrofits and renovations. WE&T also supports educating residential and nonresidential new construction industries on ways to achieve zero net energy (ZNE) targets.

¹ *California Long Term Energy Efficiency Strategic Plan*, California Public Utilities Commission, 2008 (updated 2011).

C. Expansive Offerings for EE Market Participants

WE&T is a non-resource program, and thus is not expected to provide direct energy savings to the IOU EE portfolio. However, WE&T targets a wide variety of EE market participants throughout the end-use customer sectors of Industrial, Commercial, Residential, Agriculture, and Public. A majority of SCE's WE&T offerings target contractors and technicians who serve Heating, Ventilation, and Air Conditioning (HVAC) Quality Installation and Maintenance and Advanced Lighting Controls; two areas of significant EE savings. In addition, WE&T offerings serve cross-sector DSM markets aimed at Architects, Designers, Building Owner/Operators, Engineers, Facility Management and Maintenance staff, Plans Examiners and Building Inspectors, Home Energy Raters, and Auditors that support the workforce. Through WE&T course offerings and educational opportunities, market participants learn how to influence energy savings through their decisions and work performance.

D. Local WE&T Administration & Resources

Many offerings are provided through two dedicated SCE Energy Education Centers located in the greater Los Angeles area and San Joaquin Valley. Novice and advanced EE professionals attend the training centers, as well as take advantage of in-field, on-location, and online/on-demand training opportunities that expand and enhance access throughout SCE's service territory. SCE's WE&T Program establishes and maintains relationships with educational institutions such as community colleges and trade schools for individuals at different stages in their careers, from post-secondary students exploring entry-level career opportunities to seasoned energy professionals interested in refreshing their knowledge or learning about more up-advanced technologies and practices.

II. Market Characterization

A. Customer Landscape

The Statewide WE&T program addresses two primary audience types:

- Customers and in-house staff/decision makers:
 - Building Owners/ Homeowners
 - Facility Managers
 - CEOs/Business Owners
 - Developers
- Market Actors that influence and serve customers:
 - Designers & Architects
 - Contractors & Builders
 - Engineers
 - Educators
 - Future Market Actors – Students, Workforce

Figure 1. Energy Education Center Offerings by Sector

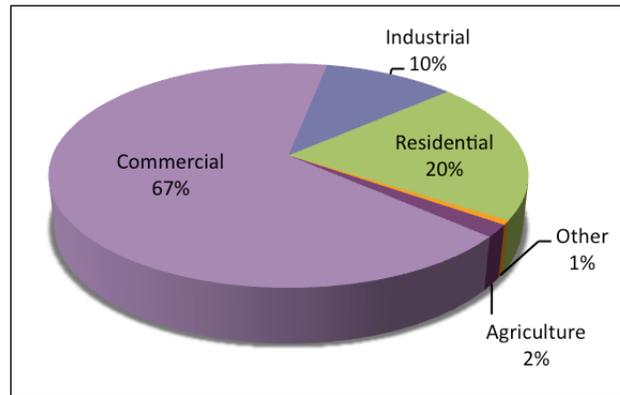
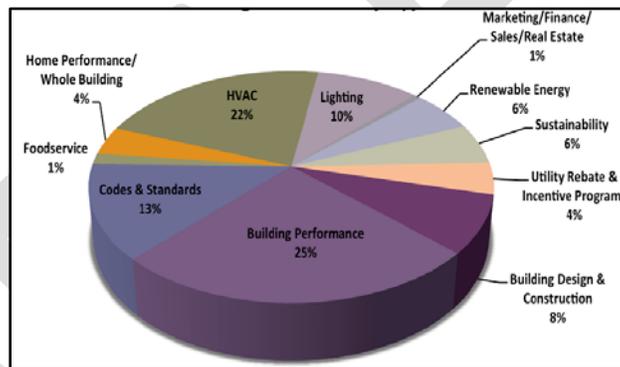


Figure 2. Energy Education Center Classes by Type



These audiences have different needs and requirements depending on the sector(s) in which they are engaged: residential – single family, residential – multifamily, commercial, industrial, or agricultural. WE&T provides the most extensive services to the commercial sector – 65 percent, with 20 percent for residential audiences, and 10 percent for industrial audiences. A wide range of classes are offered for these audiences with 25 percent in "building performance," 22 percent in HVAC, 13 percent in codes and standards and 10 percent in lighting.²

B. Market Actors Reached by Industry Area

The table below³ (Figure 3) provides an estimate of the percent of industry actors that WE&T reached based on the Don Vial Center (DVC) assessment. In certain industries, such as HVAC, engineering and architectural design, and government regulators, the WE&T program has reached over 20 percent of the market.⁴ In other

² Joint IOU WE&T Program data and documentation.

³ *California Workforce Education and Training Needs Assessment for Energy Efficiency, Distributed Generation, and Demand Response*, page 191, Don Vial Center on Employment in the Green Economy, Institute for Research on Labor and Employment, University of California, Berkeley, 2011.

⁴ Ibid.

areas, such as facility operators and maintenance or construction, for example, only two percent and six percent respectively were reached.⁵ While this information has value in helping to identify gaps and successes, there is a need to establish the appropriate level of education required, and how much knowledge was acquired, rather than focus on the number of people reached.

Figure 3. WE&T Program Reach

Industry Area	Market Actors (Statewide)	Estimated Reach by Centers	Percent Reached (Statewide)
HVAC and Refrigeration	19,700	9,427	44%
Government Agency/Regulatory/Inspector	12,500	3,263	26%
Engineering/Architectural Design	58,200	13,053	22%
Lighting	68,300	8,339	12%
Construction	161,200	9,064	6%
Boilers/Water Heating Sales	56,000	3,263	6%
Other	55,800	2,901	5%
Motors	49,400	2,538	5%
Facility Operations and Maintenance	163,000	3,263	2%
Energy Technology Research/Consulting	N/A	5,801	N/A
Pumping/Hydraulic Equipment	N/A	2,175	N/A
Renewables	N/A	5,076	N/A
Don't Know/Refused	N/A	2,175	N/A

III. Trends

The electric industry is going through a period of significant change including technological advances, policy changes, market characteristics, and customer expectations. These changes are requiring new types of WE&T program offerings that support the EE workforce.

A. Policy Trends

In addition to AB 758 (2009) leading to the *Existing Buildings Energy Efficiency Action Plan* that addressed WE&T activities and continues to be further refined over time, new legislative bills were recently enacted into law that further addresses the DSM workforce. For example:

- SB 350 (2015) tasks the CEC with adopting a responsible contractor policy to ensure that ratepayer funded EE measures meet high quality performance standards and reduce energy savings lost due to poor quality workmanship.

⁵ Ibid.

The bill also addresses workforce development and job training for residents in disadvantaged communities.

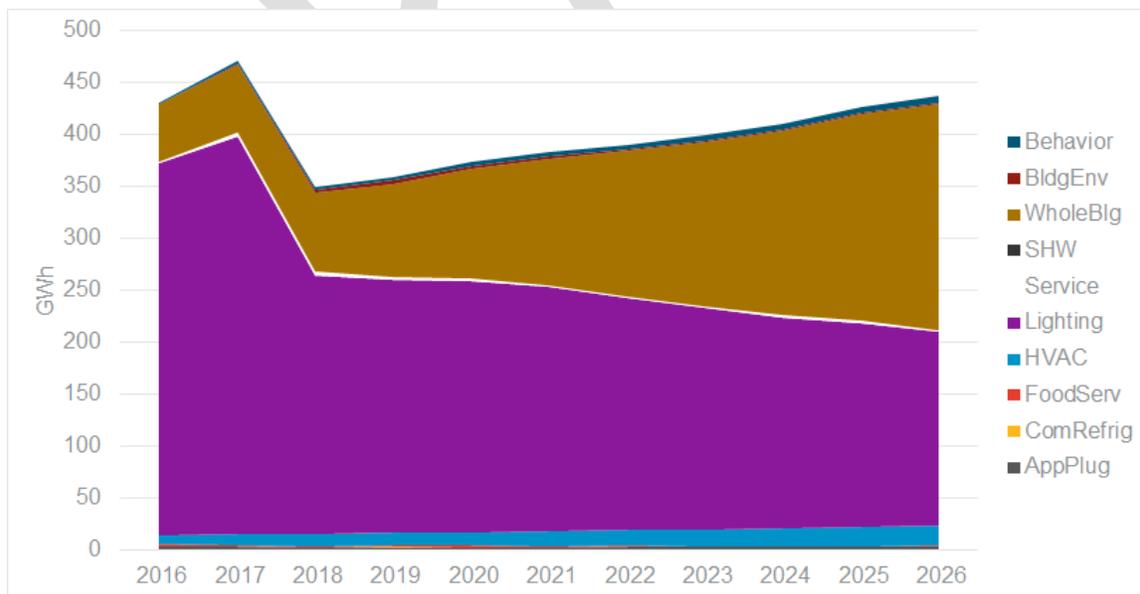
- AB 802 (2015) requires the IOUs to provide aggregated energy usage data to qualified multifamily buildings. The bill also authorizes the IOUs to provide incentives based on normalized metered energy consumption as a measure of savings.

SCE will work with stakeholders and regulatory agencies to implement new WE&T activities resulting from this legislation. This includes addressing any responsible contractor policies that impact the EE portfolio; increasing workforce and development training opportunities for disadvantaged communities; and providing new training in response to AB 802 (2015) on the best ways to incorporate normalized metered energy consumption as a measure of savings in to EE project development.

B. Energy Savings Trends

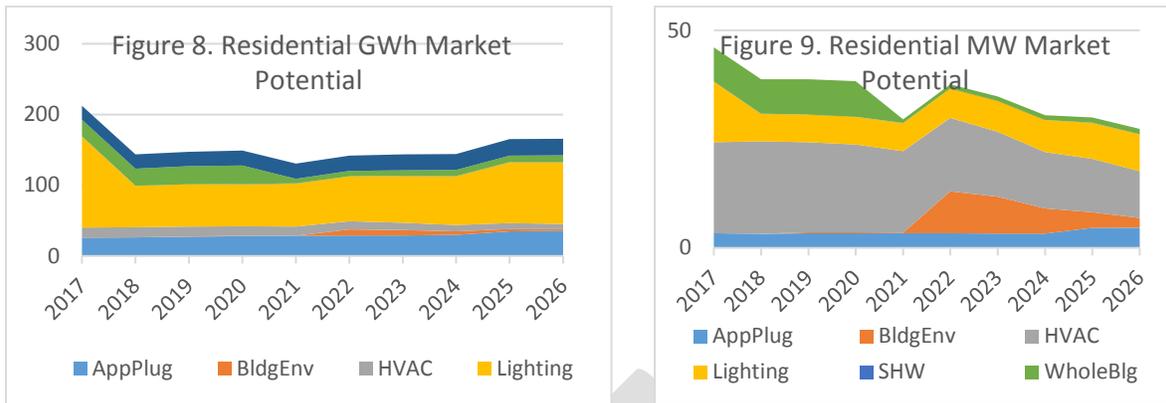
The figures below outline the EE Programs market potential that forecasts the highest-potential areas for energy savings in Commercial and Residential sectors - the highest and lowest level activity sectors, respectively, in SCE's WE&T portfolio. The Commercial forecast shows high potential in HVAC, Whole Building, and Lighting, while the Residential forecast shows high potential in Lighting, Appliances, and Whole Building.

Figure 4. Achievable Potential (Commercial Sector, GWh, 2016-2026)⁶



⁶ AB 802 Technical Analysis – Potential Savings Analysis, March 2016. *Note:* The savings are pre-AB 802 savings.

Figure 5. SCE's Potential for the Residential Sector by End Use⁷



Through a statewide framework of strategic stakeholder engagement, the IOU WE&T programs coordinate with industry partners, regulators, and other educational providers to help identify trends in the EE workforce and opportunities where additional trained professionals are needed to fill critical skills gaps to achieve EE portfolio needs.

C. Education & Training Trends

Secondary, post-secondary and adult continuing education providers, along with other training providers working within the building trades, are recognizing the importance of integrating EE concepts and best practices into their professional and applied skills training curriculum.⁸ Specifically, 2-year colleges and other trades training schools are identifying high-potential areas of focus⁹ that include high performing building operators, skilled residential and commercial HVAC system designers, installers and maintainers, designers and installers of process automation and controls technologies, facility managers, and EE building systems and technology integrators. In response, IOU WE&T programs have begun to collaborate with these training providers, infusing existing curriculum with key EE concepts and best practices and providing train-the-trainer sessions to help improve the knowledge and skills of faculty and industry experts.

As these trends evolve, the IOUs will continue to seek opportunities for alignment and integration of EE education into relevant apprenticeship and pre-apprenticeship programs; secondary career technical education (CTE) and Science, Technology, Engineering and Mathematic (STEM) programs; and 2-year college certificate and degree programs that seek to close skills gaps in energy-related occupations at an earlier level than with the incumbent workforce.

⁷ Ibid.

⁸ Cite

⁹ *Workforce Issues and Energy Efficiency Programs: A Plan for California's Utilities: Recommendations 2.1.1.1.2*, The Donald Vial Center on Employment in the Green Economy, 2014.

D. EE Cross-Sector Market Trends

Many EE market trends experienced throughout the EE portfolio inform WE&T activity and interventions to overcome a number of participation barriers. SCE's EE Portfolio identified some key opportunities where WE&T can help to achieve energy savings goals and overcome barriers to participation. These new and expanding market areas include:

- Continuation and development of enhanced work quality improvement training for HVAC contractors participating in EE programs;
- Continuation and development of enhanced pump training services for Program participants;
- Developing and delivering technician and installer training that will support meter-based energy savings projects related to AB 802 (2015) implementation; and
- Introduction of training needs for distributor community about more energy efficient products as SCE's EE Portfolio shifts downstream offerings more to midstream.

In addition to SCE's EE Portfolio unique WE&T needs, research has identified other key areas where IOU WE&T offerings can intervene and help overcome barriers to participation in EE opportunities. These observations and opportunities include:

1. **Commercial Lighting:** There is great potential for energy savings through more efficient lighting and lighting control systems in California nonresidential buildings. Developing installers' skills specific to advanced lighting controls can help realize those potential savings.¹⁰ Furthermore, research has determined that advanced lighting controls systems design, along with comprehensive manufacturer's training integration, is needed.¹¹
2. **Commercial and Residential HVAC:** Research and stakeholder feedback indicate that the HVACR technician workforce has significant skill gaps related to performing standards-based Commercial Quality Installation and Maintenance, and that quality installation and maintenance should become the industry and market norm.¹² Additionally, common knowledge and skills gaps exist in the residential HVAC workforce include understanding the value of EE, how different systems work together, and how to communicate these concepts to customers. Additional commonly cited gaps included understanding customer needs and being able to bid, manage, and supervise work.¹³

¹⁰ *Lighting Controls Training Assessment Report. CALMAC Study ID SCE0392.01*, Opinion Dynamics Corporation, 2016.

¹¹ *Ibid.*

¹² *California HVAC Contractor and Technician Behavior Study Phase II*, EMI Consulting, 2015.

¹³ *Contractor Training Market Characterization*, Opinion Dynamics Corporation, 2016.

3. **Commercial and Industrial Facilities Management:** Building operators and facility managers function as the hub for HVACR activities at their site, and stand out as the one group most engaged in activities that affect an individual building's performance.¹⁴
4. **Public Sector Code Compliance Improvement:** As codes have increased, local governments and jurisdictions face challenges when pursuing the adoption and implementation of reach codes that are more advanced than T24. Additionally, local jurisdictions are more focused on better understanding code changes, rather than code compliance.¹⁵
5. **Residential and Commercial Zero Net Energy:** The California market is not currently ready to embrace a ZNE mandate for all residential new construction.¹⁶ Market actors and decision makers throughout the Residential Homes market value chain have unique drivers and barriers to adopting upcoming ZNE mandates.¹⁷ Additionally, the Commercial Sector faces unique drivers and barriers to adopting upcoming ZNE mandates, as well as strategies to improve ZNE retrofits on existing commercial building stock.¹⁸
6. **Residential and Commercial Whole Building Design and Construction:** A majority of the Southern California Energy Efficiency Employment landscape is primarily focused on designing and increasing EE in buildings. Utility WE&T offerings should align and target EE opportunity awareness and skills development in the Commercial and Residential whole building/integrated focus area.¹⁹
7. **Agricultural Cross-Cutting:** There are many barriers to adoption of EE technologies and programs among market actors and decision makers in the agricultural sector. Examples include the lack of awareness of EE opportunities and understanding of the value of EE, methodologies and sensibilities span multiple generations, increasing resistance to change, emerging agricultural markets increased energy use without naturally occurring efficiency, and a varying array of financing and program options can be confusing.²⁰
8. **EE Sales Training:** AB 758 (2009) goals state the need to focus on training contractors and other market actors to sell EE. Research shows that EE sales skills can increase efficiency project quality, and that over 80% of those

¹⁴ *High Performance Building Operations Professionals - Achieving Zero Net Energy*, California Community Colleges Chancellors' Office, 2014.

¹⁵ *Residential ZNE Market Characterization Report*, TRC, 2015.

¹⁶ Cite

¹⁷ Ibid.

¹⁸ *Zero Net Energy Action Plan: Commercial Building Sector 2010-2012*, Engage 360, 2011.

¹⁹ *Energy Employer Survey*, Advanced Energy Economy Institute, 2014.

²⁰ *SDG&E Agricultural Sector Market Study*, Evergreen Economics, 2015.

implementing efficiency projects are also responsible for selling new opportunities.^{21, 22}

IV. WE&T Gaps and Barriers

A. Gaps in SCE's WE&T Sector

Figure 6 presents the overall sector breakdown of SCE's WE&T offerings and highlights the cross-cutting nature of the portfolio. Offerings that target the Commercial Sector represent the largest categorization at just over 55 percent.²³ Of those offerings, over 20 percent provide training that applies to the Residential Sector as well (HVAC Quality Installation technician training).²⁴ Overall, 44 percent of SCE's WE&T portfolio is cross-cutting in nature. At the time of this analysis, SCE's WE&T participant database and offering categorization did not break out Public Sector classification. Those offerings that target Public Sector end-use customers, market actors and decision makers are grouped into Residential and Commercial Sector categories.

Figure 6. Categorization of Offerings by Sector

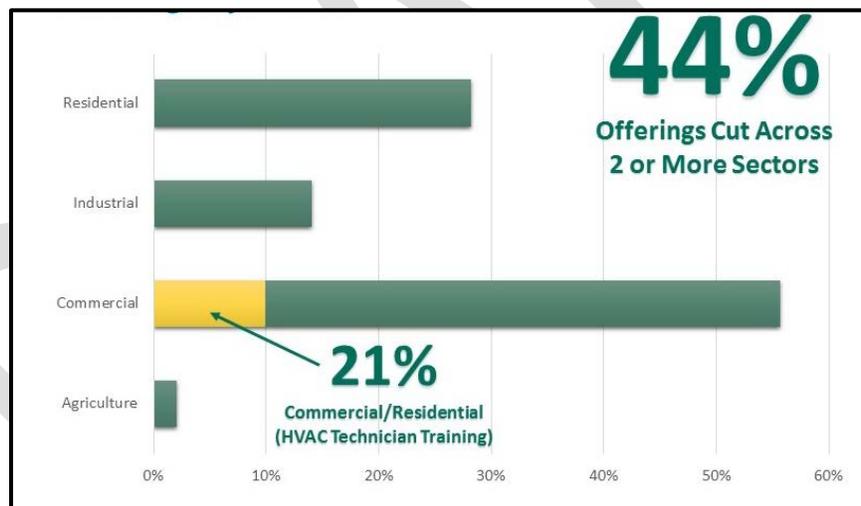


Figure 7 outlines the overall sub-sector breakdown of SCE's WE&T portfolio of offerings, with Lighting, HVAC, Codes & Standards, and Building Performance representing the largest categorizations. This figure also outlines some potential gaps in proportionate level of activity in the areas of Home Performance/Whole Building, and Building Design & Construction.

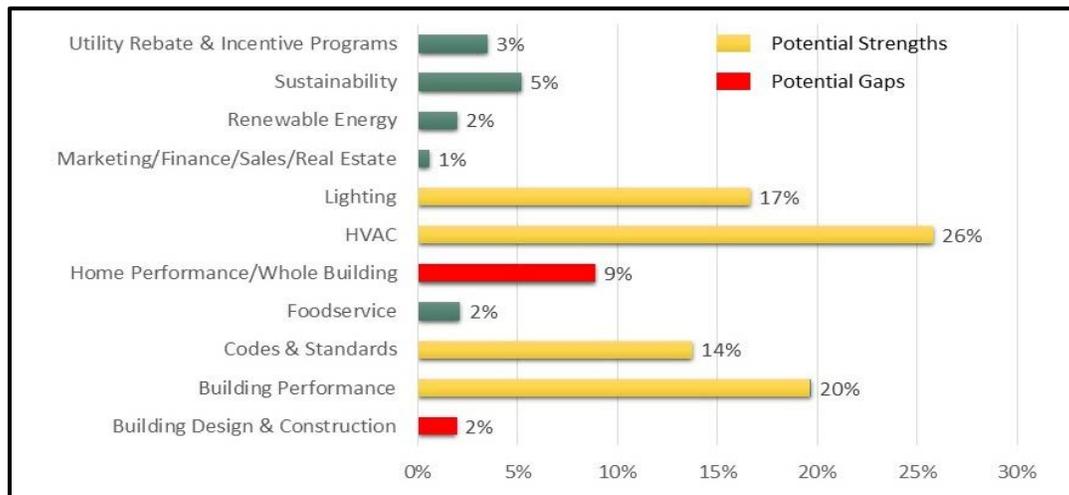
²¹ *Recommendations to Operationalize Employer Support for the HVAC Sector Strategy*, Western HVAC Performance Alliance, 2016.

²² *California HVAC Quality Installation/Quality Maintenance Customer Decision-Making Study*, EMI, 2015.

²³ SCE's WE&T Program data and documentation 2014-2015.

²⁴ Ibid.

Figure 7. Categorization by Sub-Sector²⁵



SCE continuously improves its WE&T program by addressing the most significant gaps in the current SCE WE&T portfolio of offerings as identified by program data collection and documentation. Historically, SCE's WE&T offerings indicated an unbalanced approach toward whole building design and construction and building performance curriculum with respect to the rest of the portfolio. Of the 29 percent of SCE's portfolio these categories represent, almost 70 percent are focused solely on the Commercial and Industrial sectors in the form of comprehensive Industrial automation and controls. Other important areas of whole building performance, building operations, integrated whole building energy management, and facilities management needed additional focus.

Additionally, WE&T Program data and documentation indicated that SCE's WE&T Lighting training portfolio lacked enough emphasis on targeted, relevant offerings directed towards designers advanced lighting controls and integrated daylighting systems. As lighting systems have become more automated and complex, SCE needs to keep pace with the changes in the workforce needs to address this complexity.

WE&T Program data also identified the Agricultural Sector as an area of opportunity for new curriculum development and delivery. SCE has an Energy Education Center in Tulare, CA that is focused on the needs of the Agriculture sector, yet only three percent of our portfolio focused on this high-potential sector.

B. Market Barriers for the WE&T Sector

Participants and key stakeholders face five significant barriers in the WE&T Market:

- WE&T offerings need greater market/industry alignment to help support CALTEESP, Policy, Industry, and IOU EE Portfolio goals. In order to meet the State's aggressive, long-term savings goals, the California EE workforce

²⁵ Ibid.

must be equipped with the knowledge to recognize EE opportunities and the skill to act upon these opportunities;

- California's EE goals are aggressive and require substantial engagement by a diverse mix of stakeholder participants throughout the State;
- It is difficult to measure the effectiveness and role of WE&T programs in market transformation efforts; and
- Maintaining operational efficiency is challenging in a complex and continuously evolving EE market.

Specific SCE intervention strategies and tactics to address these challenges are detailed later in this business plan.

V. Benefits of WE&T

A. Support for the California Long Term Strategic Plan

WE&T was established to support the State's EE goals to support the CALTEESP. The CALTEESP vision for California's overall workforce education and training is: "By 2020, California's workforce is trained and fully engaged to provide the human capital necessary to achieve California's economic energy efficiency and demand-side management potential."²⁶

WE&T, as a cross-cutting program, is one sector in a complex matrix of these key stakeholders, collaborators, and other service providers that cannot solely address all EE market transformation efforts needed²⁷ to help support the achievement of California's aggressive energy savings goals. As the WE&T program administrator, SCE will work in conjunction with all stakeholders including government, educational institutions, community-based and non-profit organizations, industry and labor organizations to find ongoing ways to enable WE&T to provide value as an important non-resource program supporting DSM programs.

B. Support for the EE Portfolio

The WE&T program provides foundational support to the overall EE portfolio in several different capacities. These areas include:

- Ensuring the market is aware of EE programs opportunities;
- Educating programs participants on key EE policy and code requirements;
- Increasing higher levels of workforce quality, knowledge and Influence that provides indirect impact on EE savings throughout the portfolio;

²⁶ *California Long Term Energy Efficiency Strategic Plan*, Section 9, Page 74. California Public Utilities Commission (2008, updated 2011).

²⁷ *Workforce Issues and Energy Efficiency Programs: A Plan for California's Utilities: Excerpt from Recommendation 2.1.1.1.2*, The Donald Vial Center on Employment in the Green Economy, 2014.

- Providing WE&T support for changing, new and innovative, high-potential, energy efficiency program areas;
- Offering customer educational resource center benefits (new technologies, training market transformation benefits); and
- Enabling behavior change by creating advocates of smart energy management in both students and the public.

C. Support for the other Cross-Cutting Sectors

Because WE&T's target audience includes key market actors and decision makers throughout the EE value chain, WE&T offerings can support the other cross-cutting sectors with subject matter expertise and technical assistance and can inform market actors and customers about the cross-cutting sectors' programs and services.

1. Codes and Standards (C&S)

WE&T will support the SCE's Codes and Standards Program with its education and training needs, particularly in the area of Compliance Improvement. SCE's WE&T offerings will inform market actors and decision makers across multiple end-use customer sectors about upcoming code changes, the need for compliance, the value proposition of energy efficiency, and modeling software tools and resources.

2. Emerging Technologies Program (ETP)

Through the Energy Education Centers in Irwindale and Tulare, WE&T will continue to provide ETP with technical assistance and other resources to support the awareness and adoption of relevant emerging technologies. Where appropriate, WE&T will include information about ETP projects as part of WE&T educational programs, and develop education and training programs specific to ETP activities. WE&T will also make its energy centers available for demonstrations, installations, and new product and program launch events, while integrating appropriate WE&T offerings.

3. Finance

SCE's WE&T Program has historically offered courses to high-potential market actors and decision makers on how to make a business case for EE projects. Where appropriate, WE&T will integrate the Finance sub-sector's programs into relevant WE&T courses, particularly those targeted at customers and their building operator/maintenance staff, or in other sectors where gaps in awareness of available financing programs exist.

D. Benefits for Customers and Market Participants

The WE&T Programs are viewed by customers and market participants as a trusted resource of subject matter expertise on EE. End-use customers and high-potential EE market actors look to WE&T Programs for relevant and timely training

content, expertise, and related services. The WE&T Programs provide the workforce with the knowledge to recognize EE opportunities and the skills and abilities to take action on those opportunities, ultimately resulting in energy savings that achieve EE goals. Collaborations with other education providers offer broader coverage and greater access to EE opportunities for our customers. The end result is increased participation in EE Programs.

E. Benefits to External Communities

The WE&T program provides an excellent opportunity for workers in the external communities to gain knowledge and develop skills that will support their participation in DSM program delivery. The development of a more skilled and knowledgeable workforce allows individual workers in their own communities to become better prepared for existing and emerging DSM opportunities. The WE&T program extends to all interested workers in the DSM space, including disadvantaged workers in low income and disadvantaged communities. The WE&T program also provides opportunities for local residents to become advocates in their own communities for smart energy management.

VI. Vision

California will need to ensure a qualified workforce is in place that can implement the objectives that California envisions ahead for the electric industry. Layered over the need for a qualified energy workforce is the need to implement and enforce a responsible contractor policy for use across all ratepayer-funded energy efficiency programs that involve installation and/or maintenance by building contractors to ensure that retrofits meet high quality performance standards and reduce energy savings lost due to poor-quality workmanship. In addressing this vision, SCE has set out a business plan to support the energy efficiency programs by offering learning and development opportunities through our WE&T program that will increase access to both new workforce entrants and long-time professionals. SCE envisions increasing partnerships with external workforce, education, and training entities in achieving the necessary level of expertise for the market enablers that support SCE's energy efficiency programs.

To accomplish this vision, SCE has established the following Workforce Education & Training sector goals:

- **Goal 1:** Align WE&T offerings to effectively support Regulatory, Policy, Industry, and IOU EE Portfolio Goals
- **Goal 2:** Equip the California EE workforce with the knowledge and skills to help achieve the State's aggressive long-term energy savings goals
- **Goal 3:** Advocate for engagement and collaboration throughout California's WE&T stakeholders
- **Goal 4:** Implement a data-driven approach to demonstrate the impact of WE&T

- **Goal 5:** Enhance operational efficiency of WE&T to support ratepayer cost savings throughout SCE's Energy Efficiency Portfolio

To successfully achieve these goals, SCE proposes several new strategies in addition to the existing tactics and level of activity. The 2018 program year will be used to better understand the impacts of these new and modified tasks on the program budget. SCE will adjust ongoing budget requests as necessary to deliver on the new and modified WE&T tactics identified in this business plan.

VII. SCE's Approach to Achieving WE&T Goals

The EE landscape is rapidly evolving in California as aggressive goals have been established and new methods and entities for meeting those goals arise. These new concepts are being deliberated and addressed in a number of regulatory proceedings, legislation, and forums that will affect how WE&T may implement and deliver programs.

A. Enhancing and Streamlining WE&T

To address the changing landscape, in 2016, SCE enhanced and streamlined the WE&T Program to facilitate cost efficiencies and focus on training opportunities that offer the most benefit for near-term employment opportunities. This occurred through the consolidation of program management staff that led to a one-stop-shop approach for WE&T programs and through elimination of K-12 activities, which have minimal impact on the development of DSM skills for workers currently in our about to enter the workforce.²⁸

Going forward, SCE plans to restructure the three WE&T subprograms (Connections, Planning, and Centergies) into one consolidated WE&T program. This restructuring will reduce the level of participant confusion in trying to distinguish the different offerings through the three various subprograms. In addition, this consolidation will result in fewer duplicative efforts between subprograms, leading to greater cost efficiencies in program delivery. Moreover, as part of the restructuring, the program will have updated and more clearly defined goals that are tied to specific benefits associated with the overall goals of the DSM portfolio.

SCE's Energy Education Centers will leverage IOU and industry resources to address gaps in information or relevant training while also identifying appropriate local and regional workforce training models that may be migrated across the state or integrated into the curriculum of educational institutions such as colleges and trade schools.

B. Collaborations

SCE's Energy Education Centers will collaborate with the education sector, leveraging existing providers for additional resources and training for workers. For example, SCE makes its WE&T curriculum available to educational institutions to either integrate into their own curriculum or for students to be eligible for college credit for their participation in SCE Energy Education Center offerings. SCE will

²⁸ See SCE Advice Letter 3465-E.

partner with key stakeholders and collaborators for the effective and efficient delivery of these WE&T offerings, including industry and manufacturer trainers, independent providers, trade associations, Community Based Organizations (CBOs), and apprenticeship/pre-apprenticeship training programs throughout the building trades.

C. Budget Considerations

Tables 1 - 5 identify WE&T market barriers, intervention strategies, and tactics that SCE will deploy in support of WE&T and the EE program portfolio goals. SCE proposes several new and modified tasks in supporting the WE&T program. The 2018 program year will be used to gather a better understanding of the impact of these new and modified tasks on the program budget. SCE will adjust ongoing budget requests as necessary to deliver on the new and modified WE&T tactics identified in this business plan.

D. Goal 1

Goal 1: Align WE&T offerings to effectively support State Policy, Industry, and IOU EE Portfolio Goals.

In order to position SCE's WE&T programs to effectively support the aggressive energy savings goals outlined in the CALTEESP, the portfolio of current and future offerings needs to align with and balance the needs of the markets and end-use customers and communities SCE serves. Utility EE Program market potential data, California energy policy mandates, continually evolving industry needs, and emerging trends are all factors that should inform WE&T program design and delivery. Ensuring this alignment can be difficult in a complex and dynamic EE environment. The 2014 Don Vial Center Guidance Plan for WE&T recommended that the IOUs engage a peer review group to help establish a priority setting process for the development of the WE&T portfolio of offerings²⁹. As a result, the joint IOU WE&T leadership established a comprehensive stakeholder engagement process to help ensure WE&T program alignment to the EE market. SCE will collaborate with the joint IOU WE&T team to continue this framework for comprehensive stakeholder feedback, and integrate where appropriate, recommendations from reports and other relevant EM&V work product.

Moving forward, SCE's WE&T program staff will collaborate with the joint IOU WE&T program team to initiate new efforts to evaluate program participant data collection, methodology, and metrics development to ensure alignment with near, mid, and long-term outcomes identified in the revised Program Theory and Logic Model for WE&T from 2014.³⁰ Details on how SCE will implement intervention strategies and tactics to address this market barrier are outlined in Table 1 below.

²⁹ *Workforce Issues and Energy Efficiency Programs: A Plan for California's Utilities: Recommendations 2.1.2, 2.2.1*, The Donald Vial Center on Employment in the Green Economy, 2014.

³⁰ *2013-2014 Statewide WE&T Program, Program Theory and Logic Model Update; Centergies Data Needs; and Critical WE&T Data Needs, CALMAC Study ID SDG0278.01*. Opinion Dynamics Corporation, 2014.

Table 1. Goal 1 Market Barrier and Intervention Strategies

Market Barrier 1				
WE&T offerings need greater market/industry alignment to help support CALTEESP, Policy, Industry, and IOU EE Portfolio goals				
Intervention Strategies	Tactics	E - Existing N - New M - Modified	S - Short-Term M - Mid-Term L - Long-Term	Cross-Cutting Sector Focus
Ensure alignment of WE&T offerings to support the energy efficiency market based on EE potential data, policy mandates, industry needs, and emerging trends	Establish a comprehensive engagement and feedback process to ensure delivery of the right services to the right audience through the right channels, where stakeholders will be actively engaged and part of a process of continuous improvement and feedback	E	S, M	WE&T
	Implement joint IOU WE&T initiatives locally to support State's goals, where WE&T programs are aligned to State needs and goals, and provide a consistency for the four IOUs	E	S, M, L	WE&T
	Where appropriate, assimilate recommendations from prior EM&V studies, evaluations, and reports, to help ensure alignment and to support joint-IOU efforts	E	S, M, L	WE&T
	Implement a process by which WE&T program and other performance metrics can be periodically evaluated for alignment with Program goals, policy mandates, and CPUC directives	N	M, L	WE&T

E. Goal 2

Goal 2: Equip the California EE workforce with the knowledge and skills to help achieve the State's aggressive long-term energy savings goals.

California's Long Term Energy Efficiency Strategic Plan (CALTEESP) states that Utility WE&T offerings play a significant role in advancing the state's EE and DSM goals by ensuring the training and engagement of workers with the proper skills to carry out the work and set forth the goal that by 2020, California's workforce is

trained and fully engaged to provide the human capital necessary to achieve California's economic energy efficiency and demand-side management potential. 31

To help fulfill this vision, SCE's WE&T program will intervene by:

- Developing and delivering WE&T offerings to support/shape the EE market and achieve the State's aggressive energy savings goals, based on EE potential data, policy mandates, industry needs, emerging trends, and IOU EE Portfolio goals;
- Assisting workers from disadvantaged communities in gaining skills leading to employment and/or advancement in rewarding career track jobs in EE fields; and
- Enhancing and modifying where appropriate, EE market and skills building educational offerings, resources, and tools that support and advance the WE&T portfolio of workshops and seminars.

These strategic interventions are supported by a comprehensive array of new and existing cross-cutting tactics, informed by a significant body of market research and relevant data, to be implemented in near, mid, and long-term timeframes. Some new WE&T efforts include, but are not limited to:

- Developing and delivering technician and installer training that will support meter-based energy savings projects related to AB 802 (2015) implementation. This training will enhance the skills necessary to measure energy savings at the time of intervention, upon measure installation, or at project completion;
- Developing targeted training to enhance soft skills in the technician and maintainer roles across sectors and sub-sectors, and promote the value proposition of EE to end-use customers;
- Developing and delivering EE program opportunity and new technology training targeted towards the distributor community as the EE Portfolio shifts downstream offerings more to midstream; and
- Developing and delivering new Agricultural-focused offerings targeted towards high-potential market actors and decision makers that focus on EE program participation opportunities, new and emerging technologies, and available financing opportunities.

Details on how SCE will implement intervention strategies and tactics to address this market barrier are outlined in Table 2, below.

31 California Public Utilities Commission (2008, updated 2011). *California Long Term Energy Efficiency Strategic Plan*.

Table 2. Goal 2 Market Barrier and Intervention Strategies

Market Barrier 2				
In order to meet the State's aggressive long-term energy savings goals, the California energy efficiency workforce must be equipped with the knowledge to recognize EE opportunities and the skills to act up on those opportunities				
Intervention Strategies	Tactics	E - Existing N - New M - Modified	S - Short-Term M - Mid-Term L - Long-Term	Cross-Cutting Sector Focus
Develop and deliver WE&T offerings to support / shape the EE market and achieve the State's aggressive EE goals, based on EE potential data, policy mandates, industry needs, emerging trends, and IOU EE Portfolio goals.	Develop and deliver technician and installer training that will support meter-based energy savings projects related to AB 802 implementation	N	S, M, L	Cross-Cutting
	Develop and deliver EE program opportunity and new technology training targeted towards the distributor community as the EE Portfolio shifts downstream offerings more to midstream	N	S, M, L	Cross-Cutting
	Continue to deliver industry-valued commercial advanced lighting controls installation and commissioning curriculum and pathways to certification	E	S, M	Commercial
	Support the development of curricula and other related educational resources to help improve commercial lighting system design	N, M	S, M	Commercial
	Work with current commercial advanced lighting controls training providers to enhance the existing curriculum by integrating major manufacturer training	N	M, L	Commercial

SCE Energy Efficiency Business Plan / Cross-Cutting Workforce Education & Training

Intervention Strategies	Tactics	E - Existing N - New M - Modified	S - Short-Term M - Mid-Term L - Long-Term	Cross-Cutting Sector Focus
Develop and deliver WE&T offerings to support / shape the EE market and achieve the State's aggressive EE goals, based on EE potential data, policy mandates, industry needs, emerging trends, and IOU EE Portfolio goals.	Work with current training providers to enhance technical and soft skills offerings that target the following subjects: <ul style="list-style-type: none"> • Understanding the lifecycle of installed Commercial measures • Knowledge of, and how to sell additional EE opportunities to end-use customers • Understanding end-use customer needs • Right-sizing of equipment and systems • Ability to bid, manage, and supervise projects • Knowledge of systems integration and overall functions/components 	M	S, M	Commercial
	Continue to deliver industry-valued standards-based commercial HVAC quality installation and maintenance curriculum and pathways to certification	E	S, M, L	Commercial
	Continue to deliver industry-valued standards-based residential HVAC quality installation and maintenance curriculum and pathways to certification	E	S, M, L	Residential
	Work with current training providers to enhance Residential HVAC technical and soft skills offerings that target the following subjects: <ul style="list-style-type: none"> • Understanding the lifecycle of installed Commercial measures • Knowledge of, and how to sell additional EE opportunities to end-use customers • Understanding end-use customer needs • Right-sizing of equipment and systems • Ability to bid, manage, and supervise projects • Knowledge of systems integration and overall functions/components 	N	M, L	Residential

SCE Energy Efficiency Business Plan / Cross-Cutting Workforce Education & Training

Intervention Strategies	Tactics	E - Existing N - New M - Modified	S - Short-Term M - Mid-Term L - Long-Term	Cross-Cutting Sector Focus
Develop and deliver WE&T offerings to support / shape the EE market and achieve the State's aggressive EE goals, based on EE potential data, policy mandates, industry needs, emerging trends, and IOU EE Portfolio goals.	Partner with CA Community Colleges and relevant trades to build curriculum targeted to building operators and facility managers that addresses HVAC QI / QM gaps	N	M, L	Commercial / Industrial
	<ul style="list-style-type: none"> Focus efforts in local jurisdictions through in-field offerings to Plans Examiners, Building Inspectors, and other decision makers in Government on baseline code and expected changes in future code, while encouraging the adoption of voluntary or measure-specific reach codes. Continue to collaborate with IOU Codes and Standards, Compliance Improvement teams to design, develop, and deliver relevant and timely codes training 	E	S, M	Public
	Continue to collaborate with IOU Codes and Standards, Compliance Improvement teams to design, develop, and deliver relevant and timely codes training to high-potential market actors and decision makers	E, N, M	S, M	Commercial/Industrial
	<ul style="list-style-type: none"> Develop new curriculum and other educational tools and offerings, targeted to high-potential market actors and decision makers, to enhance knowledge of technological innovations and integrated business strategies that are required to effectively understand, interpret, and meet the ZNE goals. Help develop a well-informed support industry including building inspectors, financial and real estate professionals, and other industries central to the advancement of ZNE 	N	M, L	Residential
	Develop new curriculum and other educational tools and offerings, targeted to high-potential market actors and decision makers, to enhance knowledge of technological innovations and integrated business strategies that are required to effectively understand, interpret, and meet the ZNE goals	N	M, L	Commercial
	Partner with IOU Savings By Design teams and other key industry stakeholders to develop integrated, whole building design curricula for targeted, high-potential market actors and decision makers in the Commercial new construction sector	N	M, L	Commercial

SCE Energy Efficiency Business Plan / Cross-Cutting Workforce Education & Training

Intervention Strategies	Tactics	E - Existing N - New M - Modified	S - Short-Term M - Mid-Term L - Long-Term	Cross-Cutting Sector Focus
Develop and deliver WE&T offerings to support / shape the EE market and achieve the State's aggressive EE goals, based on EE potential data, policy mandates, industry needs, emerging trends, and IOU EE Portfolio goals.	Enhance Benchmarking and Multifamily ENERGY STAR Portfolio Manager training awareness, availability, and frequency to high-potential market actors, decision makers, and building owners	M	M, L	Commercial / Residential
	<ul style="list-style-type: none"> Align WE&T offerings to both Commercial and Residential whole building/integrated energy efficiency, to enhance EE opportunity awareness and skills. Aside from traditional workshops and seminars, provide enhanced technical consultations, equipment demonstrations, and building performance tool loans from the Tool Lending Library. 	N, M	S, M, L	Commercial / Residential
	Include special skills training in core WE&T activities to help meet demand, spur innovation, and increase the body of knowledgeable building professionals. Examples of this type of special skills training are existing building Retrocommissioning (RCx) and Building Operator Certification (BOC) programs	E	S, M	Cross-Cutting
	Develop new Ag-focused offerings targeted towards high-potential market actors and decision makers that focus on EE program participation opportunities, new and emerging technologies, and available financing opportunities, while collaborating with other educational providers to expand access and reach of WE&T offerings.	N	M, L	Agricultural
	The IOUs will offer targeted Energy Efficiency Sales training programs to help increase energy savings potential, bring awareness to the value of energy efficiency, and support market transformation in market actors and decisions makers across industry sectors	N	M, L	Cross-Cutting

SCE Energy Efficiency Business Plan / Cross-Cutting Workforce Education & Training

Intervention Strategies	Tactics	E - Existing N - New M - Modified	S - Short-Term M - Mid-Term L - Long-Term	Cross-Cutting Sector Focus
Assist workers from disadvantaged communities in gaining skills that may lead to employment and/or advancement in rewarding career track jobs in EE fields	Support the development and delivery of the proposed Statewide Career and Workforce Readiness Pilot Program	N	M, L	WE&T
	Collaborate with other educational and/or service providers who already have connections and pathways to reach high-potential WE&T participants from disadvantaged communities (e.g. WIBs, CBOs, etc.)	N	M, L	WE&T
	Leverage the tools developed and knowledge gained from IOU WE&T Inclusion studies to inform activities and tactics with high-potential participants from disadvantaged communities	N	S, M, L	WE&T
Enhance and modify where appropriate, EE market and skills, building educational offerings, resources, and tools that support and advance WE&T portfolio of workshops and seminars.	Develop new hands-on teaching tools, exhibits, demonstrations, and training equipment that aligns with the portfolio of educational offerings to enhance the learning environment and drive adult learning principles	N, M	M, L	WE&T

F. Goal 3

Goal 3: Advocate for engagement and collaboration throughout California's WE&T stakeholders.

There is a large number of educational providers throughout California that have the ability to affect EE. Hundreds of training providers, including community colleges, the state-certified apprenticeship system, colleges and universities, and other institutions³² participate in a rich training and education infrastructure in which IOU WE&T programs play a supporting role. Cross-cutting WE&T is one sector in a complex matrix of these key stakeholders, collaborators, and other service providers that cannot solely address all EE market transformation efforts needed³³ to help support the achievement of California's aggressive energy savings goals.

To reinforce and enhance the role of WE&T as a statewide collaborator in this extensive educational landscape, SCE will intervene by:

- Providing EE education opportunities along an educational pathway for students and the EE workforce that includes career awareness, core energy education and career enhancement and technical upskill;
- Collaborating with relevant education and training providers to expand or enhance the energy efficiency content of their overall training program; and
- Supporting Statewide WE&T Programs and initiatives.

These strategic interventions are supported by a comprehensive array of new and existing cross-cutting tactics, informed by a significant body of market research and relevant data, to be implemented in near, mid, and long-term timeframes. Some new or enhanced WE&T efforts include, but are not limited to:

- Collaborating with external educational providers to deliver core EE education (e.g., community colleges, unions, vocational schools, etc.);
- Supporting workforce development agencies and organizations by providing EE teaching materials and career awareness resources;
- Leveraging IOU resources to develop new or deliver current/relevant WE&T offerings to teaching professionals within current education providers as well as trade training programs; and
- Continuing support for the continuous improvement and delivery of other existing and/or new statewide WE&T programs (e.g. Career Connections, Career and Workforce Readiness Programs).

Details on how SCE will implement intervention strategies and tactics to address this market barrier are outlined in Table 3 below.

³² *Workforce Issues and Energy Efficiency Programs: A Plan for California's Utilities*, The Donald Vial Center on Employment in the Green Economy, 2014.

³³ *Ibid.*: Excerpt from recommendation 2.1.1.1.2.

Table 3. Goal 3 Market Barrier and Intervention Strategies

Market Barrier 3				
California's energy efficiency goals are aggressive and require substantial engagement by a diverse mix of stakeholders throughout the state				
Intervention Strategies	Tactics	E - Existing N - New M - Modified	S - Short-Term M - Mid-Term L - Long-Term	Cross-Cutting Sector Focus
Provide EE education opportunities along an educational pathway for students and the EE workforce that includes career awareness, core energy education and career enhancement and technical upskill	Collaborate with external educational providers to deliver core EE education (e.g., community colleges, unions, vocational schools, etc.)	E, N	S, M, L	WE&T
	Collaborate with targeted organizations to expand access and reach to WE&T programs	E, N	S, M, L	WE&T
	Support specific industry-recognized certifications as well as workforce development agencies & organizations by providing EE teaching materials and career awareness resources	E, N	S, M, L	WE&T
Collaborate with relevant education and training providers to expand or enhance the energy efficiency content of their overall training program	Leverage IOU resources to develop new or deliver current/relevant WE&T offerings to teaching professionals within current education providers as well as trade training programs	E, N	S, M, L	WE&T
	Develop and share specific curriculum for high-potential opportunities with other education providers	E, N	S, M, L	WE&T
	Provide seed funding for curriculum development and sharing initiatives	E, N	S, M, L	WE&T
	Leverage established core WE&T offerings for direct infusion or articulation into the training portfolios of other education providers	E, N	S, M, L	WE&T
Support Statewide WE&T Programs and initiatives	Continue to support the continuous improvement and delivery of the joint-IOU Tool Lending Library	E	S, M, L	WE&T
	Continue to support the continuous improvement and delivery of the joint-IOU-offered curriculum and other energy center specific EE educational resources (e.g. BOC, CALCTP etc.)	E	S, M	WE&T
	Continue to support the continuous improvement and delivery of other existing and/or new statewide WE&T programs	N	M, L	WE&T

G. Goal 4

Goal 4: Implement a data-driven approach to demonstrate the impact of WE&T.

Measuring the effectiveness of market transformation and behavior change efforts, particularly in the WE&T sector, is challenging. In a 2011 CPUC-led market transformation workshop, participants widely concluded that indicators of market transformation are not always achieved through simple data collection, and that other methodologies and unconventional data collection efforts are sometimes needed, due to the complicated landscape of market transformation and behavior change³⁴.

Key observations addressing current and past EM&V activity relating to WE&T indicate opportunities to enhance program data collection, metrics development, measurement and evaluation, and reporting. For example, recent research indicates that participant data collection and subsequent analytics focus on level of activity vs. potentially more relevant longer term or market transformation indicators³⁵. Research also shows that the EE industry recognizes the benefit of IOU WE&T efforts, but the data that connects programs with EE market potential and influence is limited and can be based on outdated economic and other market indicators³⁶. Finally, previous EM&V efforts for WE&T may have relied on limited study methodologies and economic market indicators and new study methodologies should be considered to help increase efficacy and relevancy of efforts to better understand value and impact of WE&T as it relates to energy efficiency.

To enhance and increase efficacy in this area of focus, SCE will intervene by collaborating with IOU and CPUC EM&V teams to enhance data collection and evaluation efforts to ensure alignment with Program goals, policy mandates, and CPUC directives, while driving the value of WE&T market transformation activities. SCE will focus on EM&V data collection that results in actionable and fact driven data that will increase the efficiency of WE&T offerings for participants and the overall cost-effectiveness of the energy efficiency portfolio.

Details on how SCE will implement intervention strategies and tactics to address this market barrier are outlined in Table 4 below.

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³⁴ "Planning and Evaluating Market Transformation: What the Industry has Learned, and Possible Implications for California," Prah/Keating, 2011.

³⁵ "Indirect Impact Evaluation of the Statewide Energy Efficiency Education and Training Program, Volume I of IV," Opinion Dynamics, 2008-2009.

³⁶ "Program Theory and Logic Model Update Centergies Data Needs; and Critical WE&T Data Needs," Opinion Dynamics, 2013-2014.

Table 4. Goal 4 Market Barrier and Intervention Strategies

Market Barrier 4				
It is difficult to measure the effectiveness and role of WE&T programs in market transformation efforts.				
Intervention Strategies	Tactics	E - Existing N - New M - Modified	S - Short-Term M - Mid-Term L - Long-Term	Cross Cutting Sector Focus
Collaborate with IOU and CPU&C EM&V data collection and evaluation efforts to ensure alignment with Program goals, policy mandates, and CPUC directives, while driving the value of WE&T market transformation activities	Assimilate recommendations from prior EM&V studies to develop new data collection, analytics, and resulting metrics in alignment with program improvements, the program theory and logic model and potential market transformation indicators	E, N, M	S, M, L	WE&T
	Collaborate with statewide EM&V, CPUC's ED, and WE&T Programs teams to facilitate the use of additional impact evaluations in the overall EM&V roadmap, connecting SCE's WE&T Program activity with EE market potential	E, N, M	S, M, L	WE&T
	Continue to support efficient and effective data collection with ED, IOUs, or SCE initiated study efforts to maximize learning with respect to the benefit of the WE&T efforts as an embedded component of WE&T implementation	E, N, M	S, M, L	WE&T

H. Goal 5

Goal 5: Enhance operational efficiency of WE&T to support ratepayer cost savings throughout SCE's EE Portfolio.

In support of SCE's overall EE portfolio cost-effectiveness initiatives, it is incumbent upon SCE's WE&T program to ensure it is operating as efficiently as possible. As a cross-cutting program, WE&T also plays a key role in providing targeted support to the EE portfolio by ensuring the training and engagement of workers installing and implementing EE measures and projects with the proper skills to carry out the work.

In addition, SCE's Energy Education Centers have a unique opportunity to interact with key decision makers in high-potential sectors and cultivate new EE opportunities and Program participants. Finally, leveraging opportunities to lower

program and ratepayer costs, while still delivering comprehensive and compliant programming, are necessary in a dynamic and complex EE environment.

To enhance and increase efficacy in this area of focus, and to support the EE portfolio in overcoming cost-effectiveness challenges, SCE's WE&T program will intervene by:

- Reinforcing WE&T as a support and advisory role to the EE portfolio, providing efficiency and cost-effective interventions, offerings, and other educational resources targeted to specific portfolio needs, across all sectors;
- Enhancing and streamlining the WE&T Program to facilitate cost efficiencies and focus on training opportunities that offer the most benefit for near term employment opportunities;
- Modifying offering design and delivery to lower program implementation costs throughout the WE&T portfolio; and
- Improving and expanding access and reach, building awareness in high-potential sectors and target markets, while enhancing customer experience and ease of participation;

Details on how SCE will implement intervention strategies and tactics to address this market barrier are outlined in Table 5, below.

Table 5. Goal 5 Market Barrier and Intervention Strategies

Market Barrier				
Maintaining operational efficiency is challenging in a complex and continuously evolving energy efficiency market				
Intervention Strategies	Tactics	E - Existing N - New M - Modified	S - Short-Term M - Mid-Term L - Long-Term	Cross-Cutting Sector Focus
Reinforce WE&T as a support and advisory role to the EE portfolio providing efficiency and cost-effective interventions, offerings, and other educational resources targeted to specific portfolio needs across all sectors	Drive awareness of EE program opportunities through applicable WE&T offerings	E, M	S, M, L	Cross-Cutting
	Train and prepare high-potential participants for applicable EE Programs and other EE opportunities	E, M	S, M, L	Cross-Cutting
	Educate high-potential market actors and decision makers in key sectors and end-use roles on key EE policy and code requirements	E	S, M, L	Cross-Cutting
	Provide tactical and operational support for program- and sector-specific education and training needs	E	S, M, L	Cross-Cutting

Intervention Strategies	Tactics	E - Existing N - New M - Modified	S - Short-Term M - Mid-Term L - Long-Term	Cross-Cutting Sector Focus
support and advisory role to the EE portfolio providing efficiency and cost-effective interventions, offerings, and other educational resources targeted to specific portfolio needs across all sectors	Leverage the technical subject matter expertise and direct connection to end-use customers, decision makers and market actors throughout the Centergies program to cultivate new EE opportunities and Program participants	E	S, M, L	Cross-Cutting
Enhance and streamline the WE&T Program to facilitate cost efficiencies and focus on training opportunities that offer the most benefit for near term employment opportunities	Consolidation of program management staff that will lead to a one-stop-shop approach for WE&T programs and through elimination of activities, such as K-12, that have minimal impact on enabling the development of workforce skills needed to support DSM programs today	N	S, M	WE&T
	Restructure the three WE&T subprograms (Connections, Planning, and Centergies) into one consolidated WE&T program	N	S, M	WE&T
Modify offering design and delivery to lower program implementation costs throughout the WE&T portfolio	Actively participate in joint-IOU efforts to deliver a set of consistent market-building offerings through an online/on-demand learning platform	E, N	S, M, L	Cross-Cutting
Improve and expand access and reach, building awareness in high-potential sectors and target markets, while enhancing customer experience and ease of participation	Collaborate with Statewide ME&O on joint-IOU promotion and awareness efforts, focusing on both statewide and regional opportunities	E	M, L	WE&T
	Collaborate with other educational and/or service providers who already have connections and pathways to reach high-potential WE&T participants	E, N	M, L	WE&T

VIII. Metrics

SCE proposes a set of metrics for WE&T to measure the effectiveness of the intervention strategies and tactics outlined in this business plan. Metrics are one of several components that are used in examining the success and effectiveness of the Program. The metrics are designed to measure progress against the intended outcomes and priorities of the WE&T cross-cutting sector.

Historically, the effectiveness of IOU WE&T offerings has been reported through data and indicators that focus on output-oriented activity. The metrics outlined in the table below seek to examine the effect of WE&T on the EE market through outcome-oriented activity and indicators. These metrics not only support the priorities and intended outcomes of SCE's WE&T activities, but also align with recommendations from recent research and reports, such as the 2013-2014 Statewide WE&T Program Theory Logic Model Update (PTLM)³⁷. The most recent update to the WE&T PTLM recommends specific data needs and short-term, measurable outcomes that can help WE&T programs support California's long-term strategic energy efficiency goals. These outcomes include, but are not limited to:

- Increased awareness and knowledge of EE, DR, and DG options and/or practices for end-users;
- Improved skills of participants (market actors and decision makers); and
- Increased participation of disadvantaged workers.

The metrics outlined in Table 6, below, support and begin to build upon these recommendations, and seek to indicate the success of WE&T efforts in supporting the State's aggressive energy savings goals.

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³⁷ "Program Theory and Logic Model Update Centergies Data Needs; and Critical WE&T Data Needs," Opinion Dynamics, 2013-2014.

Table 6. Energy Efficiency Business Plan: WE&T Sector Metrics

Market Barrier	Desired Sector Outcome	Intervention Strategies	Sector Metric	Baseline	Metric Source	Short-Term Target	Mid-Term Target	Long-Term Targets
						(1-3 years)	(4-7 years)	(8-10+ years)
WE&T offerings need greater market /Industry alignment to help support CALTEESP, Policy, Industry, and IOU EE Portfolio Goals	WE&T offerings are aligned to help effectively support CALTEESP, Policy, Industry, and IOU EE Portfolio Goals	Evaluate WE&T offerings and restructure and/or design programs accordingly to focus on highest-potential and best alignment with market needs	% offerings that align with regulatory initiatives	N/A (new metric)	Evaluation criteria needs to be defined	Evaluation criteria defined and measurement to establish baseline begins	100% of WE&T offerings are aligned with regulatory initiatives that were put forth since 2018	100% of WE&T offerings are aligned with regulatory initiatives that were put forth since 2022
	WE&T offerings target and promote awareness of high-potential and high-yield energy savings EE Programs		% offerings that target or promote measures and programs that yield savings	N/A (new metric)	WE&T program data and documentation	Evaluation criteria defined and measurement to establish baseline begins	% increase in offerings that target or promote measures and programs that yield savings	% increase in offerings that target or promote measures and programs that yield savings
	Increased awareness and accessibility of WE&T offerings to participants in or from disadvantaged communities		% offerings that reach disadvantaged workers	Baseline defined by evaluating WE&T program data and documentation against AL definition	WE&T program data and documentation	% increase in offerings that target or promote measures and programs that yield savings	% increase in offerings that target or promote measures and programs that yield savings	% increase in offerings that target or promote measures and programs that yield savings
The California energy efficiency workforce must be equipped with the knowledge to recognize EE opportunities, and the skills to act upon those opportunities.	WE&T offerings help equip the California EE workforce with the knowledge and skills to help achieve the State's aggressive long-term energy savings goals	Develop and deliver WE&T offerings to support and shape the EE market and achieve the State's aggressive energy savings goals	% knowledge gain as a result of course participation	Current % knowledge gain - N/A (new metric)	WE&T program data and documentation - Pre- and post-course surveys that target key course learning objectives	% increase in measured knowledge gain as a result of course participation	% increase in measured knowledge gain as a result of course participation	% increase in measured knowledge gain as a result of course participation
Maintaining operational efficiency is challenging in a complex and evolving energy market	Other core educational providers are leveraged to increase awareness, access, and reach of WE&T offerings throughout the State	Collaborate with other educational and/or service providers who already have connections and pathways to reach high-potential WE&T participants	% offerings delivered through strategic partnerships with other core education providers	Current % partnership delivery - WE&T program data and documentation	WE&T program data and documentation	Evaluation criteria defined and measurement to establish baseline begins	% increase in offerings delivered through strategic partnerships as defined	% increase in offerings delivered through strategic partnerships as defined

IX. Program / Program Administrator (PA) Coordination

The Joint IOU WE&T Team has developed an overarching program administration structure that coordinates efforts across the IOUs. This structure allows for statewide solutions with regional implementation addressing workforce needs. The IOU WE&T team acts as a statewide advisor and implementer of WE&T opportunities for EE stakeholders.

The IOU WE&T Team holds frequent coordination meetings to address best practices, new opportunities, and statewide engagement with all market actors in support of meeting the State's EE goals. The IOU WE&T team leverages the collective skills of the four IOUs and WE&T stakeholders, allowing for the engagement of a very broad and active network of WE&T partners.

SCE will collaborate within its service territory with other non-IOU implementers of WE&T programs. SCE will seek to leverage the best practices of other implementers and to also reduce any potential duplication of services.

To ensure all the IOU WE&T teams are focused on collaboratively making the programs a success both at a local and statewide level, SCE has committed to the mission, values, and strategic framework identified below:

A. Coordinated IOU WE&T Mission

To facilitate, support, and provide subject matter expertise for the transfer of EE knowledge and skills to the industry across all sectors, balancing the needs of the State, customers, and the communities we serve.

Coordinated IOU WE&T values include:

- **Be Customer & Market Driven:**
Utilize customer and market data to guide and inform programs.
- **Be Collaborative:**
Leverage the strengths and expertise of external and internal stakeholders to become a state of the art education, technology and resource center.
- **Be Accessible:**
Optimize accessibility for target audiences in energy efficiency.
- **Be Innovative:**
Explore and implement new approaches to achieve goals.
- **Be Integrative:**
Design offerings to reflect and support an integrated approach to energy efficiency.
- **Be Technically & Operationally Excellent:**
Expand use of technical capabilities and subject matter expertise in Energy Efficiency as well as enhance operational effectiveness in the design and delivery of program services.

- Coordinated IOU Strategic Framework:

The Strategic Framework encompasses the following themes for WE&T's efforts:

- Collaborations and partnerships are critical to the success of WE&T statewide and locally;
- Engagement with internal and external stakeholders must be part of an ongoing and continuous improvement process;
- Better data, better analysis and better measurement is essential to create relevant and valuable training and education offerings; and
- The quantity of training and education opportunities does not have as much impact as ensuring that the right information is delivered to the right people, in the right way.

The Strategic Framework has been articulated to focus its effort to address key issues and market barriers. The Joint IOU WE&T Team identified five strategies to guide future initiatives, resource allocation, and approach to overarching WE&T goals:

1. Implement statewide WE&T initiatives locally to support State goals.

Objective: WE&T programs are aligned to State needs and goals, and provide a consistent framework for the four IOUs.

2. Target value-added collaborations with statewide stakeholders and other education & training providers.

Objective: The network of collaborators will complement and expand WE&T's reach and depth of EE concepts and activities with key audiences.

3. Establish a comprehensive engagement and feedback process to ensure delivery of the right services to the right audience through the right channels.

Objective: Stakeholders will be actively engaged and part of a process of continuous improvement and feedback.

4. Improve and expand access and reach, build awareness, and make it easier to participate in WE&T programs.

Objective: Key audiences participation, depth of knowledge, and satisfaction increases.

5. Ensure that Joint WE&T efforts are managed and implemented to be efficient, adaptable, and accountable.

Objective: Targeted market and customer data analysis and project management leads to more relevant and valuable programs that support energy savings.

X. EM&V Considerations

The WE&T program has evolved and benefitted from evaluations over the years. These evaluations have provided insights into ways the program has been successful as well as ways in which the program may be modified and improved. Evaluations conducted from 2006-2008 informed key ways to modify program design and delivery to better achieve the program's goals. This included such things as an increased focus on key technologies and increasing efforts to direct customers and contractors to rebate programs. In addition, there were recommendations on how to improve program tracking and monitoring. Subsequent evaluations conducted during 2010-12 and 2013-14 provided useful information on ways in which the program's offerings can facilitate the overall goals of WE&T as set forth by the Strategic Plan. This work provided suggestions on how to increase the program's reach and how to refine courses with greater emphasis on skill building and "real-world" applications of the material.

The Evaluation results from several studies conducted during 2010-12 provided direction and a general framework for making ongoing changes to the WE&T programs. For example, SCE has increased (a) delivery of content and course via Internet and online resources, (b) attention to "skills building" efforts, in conjunction with "market building." Additional research during 2014 examined key activities, elements, outputs and outcomes of the programs and provided updated information for the program's theory and logic model. Based on some of the findings and recommendations SCE has modified course content, target marketing strategies and the type and nature of data collection solicited from program participants. These efforts are expected to improve the overall effectiveness of the program as well as assist program staff and evaluators in future examinations of the effectiveness of the program and relevant interventions.

Overall, the EM&V evaluations and assessments highlight the importance of having clearly defined goals and logic that subsequently can be closely aligned with key program direction, activities and ultimately the achievements of the program.

The results of these evaluations continue to guide SCE's approach to refining the WE&T Program to meet relevant workforce needs while remaining focused on achieving overall savings for SCE's EE portfolio and achieving the State's EE policy goals.

XI. Appendices

A. Business Plan Checklist

B. Stakeholder Feedback

Information to be provided when Final Business Plans are submitted in January 2017.