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| **Commenter: Please Fill In This Part Of The Form** | **For PA Use** |
| **Comment #** | **Stage** | **Sector** | **Page #** | **Comment** | **Rationale for Comment****(include references to evaluations, studies, etc., if applicable)** | **Integrated (Y/N)** | **Rationale for Y/N** |
| *TEC - 1* | 2 | *WE&T* | 1) Statewide: WE&T Business Plan, Stage 2 (Page 17) | Observations* In the Statewide Workforce Education & Training Business Plan, the team identifies and presented that “Big Data” and outcome-based evaluation methods vs. current metrics are in-line with learning and teaching trends.

Recommended Action* TEC recommends that the IOUs increase collaboration with implementers (SMEs) to identify standardized best practices for establishing outcome-based metrics and evaluation techniques (actionable metrics) in place of or in addition to current metrics to track and analyze EE knowledge and behavior change, particularly in relation to building an effective K-postsecondary pipeline.
* TEC further recommends that the IOUs work with implementers to identify a process by which to identify and reach consensus on quantitative metrics and appropriate, meaningful outcomes. Additionally, we recommend that the IOUs work with implementers to assess the nexus between program activities and the positive impacts around understanding of and knowledge gains in energy- use and energy efficiency, renewables, energy management and career connection topics.
 | Rationale * Outcome-based data measures and reflects significant gains EE-based student learning outcomes, knowledge gains, interest in career pathways and pro-environmental behavior changes. (Together Brave, PEAK Student Learning Outcomes: 2014-15, Executive Summary)
* [*http://media.wix.com/ugd/0c9650\_c0e68e025a05447baeda27dabd500658.pdf*](http://media.wix.com/ugd/0c9650_c0e68e025a05447baeda27dabd500658.pdf)
* ***[Big](http://ero.sagepub.com/content/spero/2/2/2332858416641907.full.pdf)*** [***Data Comes to School: Implications for Learning, Assessment, and Research***](http://ero.sagepub.com/content/spero/2/2/2332858416641907.full.pdf)(University of Illinois, 2016)
* [***Big Data for Enhanced Learning Analytics***](https://concord.org/sites/default/files/pdf/big-data-and-learning-analytics.pdf) (Big Data Analytics Research Lab, Goethe University, 2013)
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| *TEC - 2* | *2* | *WE&T* | 1) SoCalGas: Draft Plan Presentation (Page 6)2) SoCalGas: Draft Plan Presentation (Page 7)3) SDGE: Draft Plan (Page 7)  | Observations* In the SoCalGas Stage 2: Draft Cross-Cutting Sector, WE&T Segment Profile and Market Problem/Solution Statements for the Rolling Portfolio Business Plans Presentation, SoCalGas states the following problem statement “Education/training content needs to be adapted to reach specifically sought and underserved audiences” (Page 6)
* In the same report, SoCalGas cited the observation from their customer data that there is a “Large number of underserved customers and disadvantaged workers to reach”. (Page 7)

Recommended ActionIn view of the observations and comments above, as well as review of the WE&T Program Theory Logic Model as presented on May 3rd 2016, TEC recommends that K-8 services reduced during the 2015 RFP process, are reinstated (SCE, SCG, PGE) and that services are expanded for K-12 students statewide, particularly for those that are “disadvantaged,” to build the Science, Technology, Engineering, and Mathematics (STEM) skilled workforce necessary to fill existing and growing gaps and adequately prepare K-12 students for successfully seeking, and entering Energy Efficiency (EE) and Green Careers.As reported by Achieve, an independent organization that is recognized across sectors as the formative expert on how to ensure students are prepared academically for post-secondary education and career readiness, “Disadvantaged students traditionally have less access to advanced math and science courses, even though their interest in those courses is on par with the interest of their more advantaged peers. The growth of STEM learning can go a long way towards providing new opportunities for students previously denied advanced course‐taking options.” Our expertise gained over decades of directly supporting teachers and students in the field confirms that providing these services during K-12 is vital to preparing disadvantaged students for the future workforce opportunities that will help them best overcome factors of disadvantage. A disadvantaged student is more likely to become a disadvantaged worker unless they are served as early as possible with education and career readiness. | Rationale * **California Energy Efficiency Strategic Plan:** “Ensure that minority, low income and disadvantaged communities fully participate in training and education programs at all levels of the DSM and the energy efficiency industry.” ([**California Energy Efficiency Strategic Plan, page 72, section 9.3, Goal #2**](http://www.energy.ca.gov/ab758/documents/CAEnergyEfficiencyStrategicPlan_Jan2011.pdf))
* [***Strategies for Leveraging STEM in Support of College- and Career-Ready Graduation Requirements***](http://www.achieve.org/files/StrategiesforLeveragingSTEMinSupportofCollege-andCareer-ReadyGraduationRequirements.pdf) (Achieve, 2010)
* WE&T Program Theory Logic Model, 2013-14 WE&T PTLM and Critical Data Gap Assessment, ([**SoCalGas Stage 2: Draft Cross-Cutting Sector, WE&T Segment Profile and Market Problem/Solution Statements for the Rolling Portfolio Business Plans, page 8, Figure 7: Intermediate Outcomes**](http://media.wix.com/ugd/0c9650_053ab558c62944a093b6572562161d64.pdf))
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| *TEC - 3* | 2 | *WE&T* | 1) SDGE: Business Plan, WE&T Chapter, Stage 2 (Page 7) 2) Statewide: Workforce Education & Training Business Plan (Solution 3. Page 18)3) SoCalGas: Draft Plan (Page 12)  | Observations* SDGE’s Draft Plan states that it will “support workforce education and training so that the labor market is prepared to perform quality work on energy projects, equipment, and systems.”
* In the Statewide WE&T Business Plan the IOUs state an intent to “Improve and expand access and reach, build awareness and make it easier to participate in WE&T programs.”
* In the SoCalGas Stage 2: Draft Cross-Cutting Sector, WE&T Segment Profile and Market Problem/Solution Statements for the Rolling Portfolio Business Plans, SoCalGas describes the following “...Connections is designed to create long-term diligence and momentum around EE. Through K-8 education, it [SoCalGas] increases access to technical education.”

Recommended Action* To ensure the future workforce is adequately equipped with the necessary skills needed to drive and innovate the energy efficiency services industry, it is critical to actively engage K-12 students in building their STEM skills, essential for the EE industry, which as research has determined that is during their elementary years that students form interest in both STEM identities and careers. Additionally, The Department of Commerce reports STEM occupations are projected to grow much faster than non-STEM employment, with 2.6 million jobs projected by 2018. As reported by the U.S. Congress Joint Economic Committee, “Improving access to quality STEM education will strengthen the caliber of the U.S. workforce, drive economic growth, and keep the U.S. competitive.”
* Although K-12 programming is discussed through general statements in the IOUs draft plans, including the Statewide Presentation, K-12 audiences are omitted as a target audience in the Business Plan presentation under “Education Audiences.” (Page 5 for SoCal Gas). TEC recommends inclusion of K-12 as an Education Audience in each IOU plan and the Statewide plan.
* In the Statewide Presentation (Page 5) K-12 is identified as a “Key Collaborator and Partner.” However, in this same presentation, K-12 implementers are not identified as service providers. TEC recommends inclusion of K-12 implementers as service providers, market actors and stakeholders throughout the plan.
 | * [***Improving STEM Curriculum and Instruction: Engaging Students and Raising Standards***](http://successfulstemeducation.org/resources/improving-stem-curriculum-and-instruction-engaging-students-and-raising-standards) (Community for Advancing Discovery Research in Education and National Science Foundation)
* [***STEM: Good Jobs Now and for the Future***](http://www.esa.doc.gov/sites/default/files/stemfinalyjuly14_1.pdf) (U.S. Department of Commerce Economics and Statistics Administration)
* [***STEM Education: Preparing for the Jobs of the Future***](http://www.jec.senate.gov/public/index.cfm/democrats/2012/4/stem-education-preparing-jobs-of-the-future) ( Joint Economic Committee Chairman’s Staff, Senator Bob Casey, Chairman, April 2012)
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| *TEC - 4* | *2* | *WE&T* | 1) SoCalGas: Draft Plan (Page 12) 2) Statewide: WE&T Business Plan, Stage 2 (Page 2)  | Observations* In the SoCalGas Stage 2: Draft Cross-Cutting Sector, WE&T Segment Profile and Market Problem/Solution Statements for the Rolling Portfolio Business Plans, SoCalGas observes under Proposed Solutions: Other Insights, that expanded collaborations between SoCalGas WE&T and local trade and industry affiliates, as well as promote seamless linkage between subprograms to showcase pathway relationships and options to audiences.
* In the same report, SoCalGas recognizes that pathways through all levels of education are critical to tapping the full potential from EE training.
* The Statewide WE&T Business Plan’s Vision asserts that “leveraging the collective strength of the four IOUs”, WE&T will “become more effective” and that it strives to “Be an innovative advisor and leader of workforce education and training to help meet the state’s energy efficiency goals.”

Recommended Action* In view of the observations and comment above, TEC supports the direction of the IOUs to combine Centergies and Connections and recommends that the Statewide IOUs implement a holistic, pipeline approach, to managing and implementing portfolio offerings and connect K-12 through postsecondary programs under one “Program,” thereby promoting inter-pathway partnerships between subprograms, encouraging best practices in design and implementation through collaboration, and providing opportunities to implement a longitudinal evaluation of EE knowledge and behaviors across offerings, strengthening the entire portfolio.
* As identified by the American Institutes for Research, there is an “essential” need for “horizontal and vertical alignment between Career and Technical Education and K–12 education” and “leaders in K–12 and higher education need to set priorities to create and maintain these partnerships in an effort to help more students be college ready and successful.”
 | * [***Up to the Challenge: The Role of Career and Technical Education and 21st Century Skills in College and Career Readiness***](http://www.p21.org/storage/documents/CTE_Oct2010.pdf)(Association for Career and Technical Education, National Association of State Directors of Career Technical Education Consortium and Partnership for 21st Century Skills, 2010)
* [***Connecting Education to Economic Development through Career Pathways***](http://www.ncpn.info/downloads/Thriving_in_Challenging_Times.pdf) (Institute for a Competitive Workforce and National Career Pathways Network, April 2012)
* [***How Career and Technical Education Can Help Students Be College and Career Ready***](http://www.aypf.org/wp-content/uploads/2013/04/CCRS-CTE-Primer-2013.pdf)(American Institutes for Research, 2013)
* [***Investing in America’s Future: A Blueprint for Transforming Career and Technical Education***](https://www2.ed.gov/about/offices/list/ovae/pi/cte/transforming-career-technical-education.pdf) (U.S. Department of Education, 2012)
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| *TEC - 5* | *2* | *WE&T* | 1) Statewide: WE&T Business Plan, Stage 2 (Page 5)  | Observation * As presented in the Statewide Workforce Education and Training Business Plan overview, Problem Statement 1. Refers to the disconnection of education and training providers statewide, and refers to lack of motivation for students/learners/business owners to engage in energy efficiency education.

Recommended Action* To maximize program interest, enrollment and participation/engagement, TEC has found that maintaining an “expert” status in the K-12 science and environmental education field and staying on the cutting edge of education industry trends. Based on our experience, we recommend engaging implementers that build IOU and CEESP-founded curriculum, training and programming that also meets the immediate and long-term needs of the targeted population, while incorporating industry best practices (such as Common Core, Next Generation Science Standards, Professional Development Standards, STEM-principles and Project Based Learning) that appeal to decision makers and participants. By understanding the industry needs of our service population, we are more able to successfully design, implement relevant, useful and impactful programming and effectively measure success. TEC further recommends increased reliance on implementers to provide subject matter expertise regarding breadth, best practices, capacity and needs of service populations. As research informed by the American Society for Training and Development has found, “having subject matter experts or trainers review and confirm the identified needs from the [learners’] perspectives is very critical in customization. Verification from diverse perspectives on training needs should be done before stepping into the design phase.”
 | Rationale * [***An Exploratory Study for Building a Conceptual Framework of Customized Training***](http://files.eric.ed.gov/fulltext/ED485017.pdf) (Jieun Lee, Indiana University, 2004)
* [***Personalised Learning: Educational, Technological and Standardisation Perspective***](http://schools.cbe.ab.ca/b352/pdfs/PersonaliziedLearning_Educational.pdf)(European Commission: Information Society Technologies Programme, 2002)
* [***Personalized Learning: A Guide for Engaging Students with Technology***](http://www.iste.org/handlers/ProductAttachment.ashx?ProductID=3122&Type=Download) (International Society for Technology in Education, 2014)
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Instructions: These comments need to be specific, reference pages where appropriate, and be focused on Business Plan level strategies.