

CCSE Evaluation of PWP's Pasadena Solar Initiative and Commercial Energy Efficiency Programs – Phase 1 Analysis – July 21, 2011

Program Area	Key Findings	Recommendations	References/Resources
Goals	<ul style="list-style-type: none"> • PWP has set reasonable EE goals (~1.2 % of Load and Demand) • FY '07-10 goals exceeded, FY '11 not sure • Goal-setting tool (CalEERAM) is cryptic and uses key assumptions that are determined by larger forces (IOUs/CEC/CPUC) • CalEERAM “decision maker” variables did not seem consistent with PWP tariffs, future electricity price escalation rates • CALEERAM recommended goals in 2013 likely to be higher 	<ul style="list-style-type: none"> • 2013 CalEERAM modeling should be carefully considered to ensure that goals are in line with PWP-specific factors- including electricity rates and annual escalation, market sectors. This will be important to the degree that CalEERAM goals are higher than AB 2021 requirements of 1%of electricity load savings per year • Office sector the main driver of increased recommended EE goals in 2014 • Clarify customer participation goals, without clear goals for participation from different key accounts and SMEs, it is difficult to plan, budget, and evaluate progress on the breadth of commercial customers that have participated/are participating in the EE program 	<ul style="list-style-type: none"> • Review of PWP's 2010 CalEERAM model. See spreadsheet: 'EERAM_2010_PWP_CCSEs_Version.xls' see especially columns E and F of 'Summary Parameters' and line 17 for annual electricity price escalation rate and 'Market Potential' tab for info on goals by commercial sector • Conversation with Gary Cullen at Navigant Consulting Gary Cullen Navigant Consulting (formerly Summit Blue) Portland/Vancouver NW Office (360) 718-8392 gary.cullen@navigantconsulting.com

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Impact and Strategy	<p>EEP Program</p> <p>Market Segments</p> <ul style="list-style-type: none"> • Schools/Caltech taking a disproportionate share of funding • Incentives for office buildings/healthcare proportionately distributed • Government/groceries are opportunities for increasing breadth of market segments included- feedback from Robert is that many groceries have already implemented corporate-wide EE improvements, however • Opportunities for continued EE opportunities with key EEP program participants such as Caltech and PUSD over the next 3-4 years, but then other market segments will need to be better targeted to meet EE goals. Caltech EM estimates current rate of savings is sustainable and PUSD EM estimates 20% savings potential in next few years <p>Project Types</p> <ul style="list-style-type: none"> • Lighting/HVAC account for most of the savings, makes sense given energy use in PWP customer base, great that not simply relying on lighting as CEC is concerned about reliance on lighting 	<p>Strategy Recommendations:</p> <p>EE Program Goal: Meet MWh and MW Targets Near Term (0-3 years)</p> <ul style="list-style-type: none"> • Continue to work with schools, Caltech and PUSD to achieve large-scale savings • Establish clear program relationships with City of Pasadena's efforts to achieve savings through EECBG money <p><i>Longer Term (2+ years)</i></p> <ul style="list-style-type: none"> • Develop other key account relationships to achieve savings, perhaps formalize "Energy Partner" recognition to encourage program participation • Leverage "Office of the Future" program for Pasadena to work with Property Mgt Office Sector <p>EE Program Goal: Identify cost-effective energy-saving opportunities</p> <ul style="list-style-type: none"> • Continue to work with SCPPA/CMUA to identify best practices • Provide customers with <i>sector-specific</i> rather than technology-specific trainings, materials, and partnerships targeted to key sectors in Pasadena- leverage existing resources where possible 	<p>For EEP program impact by market segment and project type, see spreadsheet 'EEP Database Cost and Impacts by Market Segment and Project Type'</p> <p>Caltech. By CCSE's calculations, Caltech's on-site generation produces about 93,000 MWh per year and their total electricity use is ~120,000 MWh per year, so about 27,000 MWh of load would be coming from PWP to Caltech per year. According to PWP's database, Caltech has achieved ~ 8000 MWh of energy savings that has been incentivized through PWP's EEP program, mostly in FY 11. At ~ 8000 kWh of savings per year, electricity savings could be tapped in 3-4 years on a MWh basis, though Caltech's reliance on the PWP grid to meet demand (MW) is much more complicated of course. Also, growth in overall energy needs at Caltech may mean that EE opportunities are correspondingly higher.</p> <p>New Energy Manager at PUSD Sees significant potential for savings of ~20% and bond money available to fund improvements Christopher C. Anderson Pasadena Unified School District (626) 396-3600 x88506</p> <p>The Office of the Future (OTF) program is working to create opportunities for comprehensive energy savings in commercial office buildings through development of a carefully targeted, nationwide incentive program. Utilities customize and deliver local implementation, marketing and incentive rates suited to their customers and other program offerings. http://newbuildings.org/advanced-design/advanced-energy-office</p> <p>Existing (and free) sector-specific guides: ASHRAE Advanced Energy Design Guides http://www.ashrae.org/technology/page/938 Energy Star Small Business Guides</p>

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Impact and Strategy	<p>SMEs</p> <p>Impact</p> <ul style="list-style-type: none"> DIET <p>17 customers that did not also participate in EEP program, many DIET participants were larger customers who were already participating in the EEP program</p> <ul style="list-style-type: none"> SBAID <p>200 customers per year out of 6,500 commercial accounts</p> <p>Strategy</p> <ul style="list-style-type: none"> Barriers to SME participation are significant, direct install programs are a logical response to that Financing and technical assistance can also help SMEs invest in EE Simpler application process facilitates SME participation 	<p>EE Program Goal: Provide direct assistance to qualified customers</p> <ul style="list-style-type: none"> Ensure that additional low cost technologies in small business direct assistance strategy are not missed <ul style="list-style-type: none"> AC Tune-ups ~\$0.60 per 1st year kWh Vending Miser ~ \$0.40 per 1st year kWh Refrigeration Tune-Ups ~cost should be comparable to AC tune-ups Provide a financing mechanism for small businesses who participate in direct install program that want to make further investments in EE through SAFE-BIDCO Program <p>EE Program Goal: Demonstrate and evaluate new and emerging technologies</p> <ul style="list-style-type: none"> Demonstration projects with Caltech are a natural fit Consider pursuing demand response program with Caltech (peak load of 18 MW) Evaluated thermal energy storage, does not appear cost-effective way to meet MW targets if can be achieved through EEP program <p>EE Program Goal: Reduce environmental impacts of buildings</p> <ul style="list-style-type: none"> Create clear program relationship between City of Pasadena's CalGREEN standards and PWP to be able to account for savings related to Tier 2 Title 24 standards. Need further clarification from CEC, but perhaps at least a technical assistance program Pursue Savings by Design Program for New Construction/Major Renovations 	<p>See spreadsheet 'CCSE Cost Estimates for Direct Install Programs' for how cost per 1st year kWh determined</p> <p>For more on barriers to SME participation http://www.epa.gov/cleanenergy/documents/suca/consumer_perspectives.pdf</p> <p>SAFE-BIDCO Energy Efficiency Loan Program http://www.safe-bidco.com/content.asp?contentid=557 Program in place since 1981 Rate- prime plus 3% of 6.5% whichever is less Loans up to \$450,000 \$275 application fee which some utilities reimburse SBA guidelines business with <\$8 million revenue qualify Have also financed solar projects Revolving fund, self-sustaining Only 2 defaults Contact: Sunny Lapham sl@safe-bidco.com (707) 577-8621</p> <p>ICE BEAR technology</p> <ul style="list-style-type: none"> being pursued by a number of SCPPA members Some efforts are being funded through research grants Incentives are 800-1500/kW Could solidify MW savings Each unit shifts about 7 kW At ~1000 per kW, 1 MW would cost \$1,000,000 in incentives, management costs for ~140 incentives per year Not cost-effective compared to EEP strategy

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Design	<p>Admin/M&O/EM&V</p> <ul style="list-style-type: none"> • Overhead costs are low compared to other POU's • Relying on key accounts has kept admin costs low • Broader participation will require a redirecting of resources <p>Incentives PWP incentives appear high compared to SCE/other utilities- 200-400% higher while commercial electric rates are not proportionately lower in PWP territory (~25% lower than SCE)</p>	<p>Admin/M&O/EM&V</p> <ul style="list-style-type: none"> • Don't expect dramatic cost savings through reduction in overhead • Review \$/kWh and \$/kW incentive rates, consider a reduction • Admin/M&O expenditures will need to be increased to support broader program participation (more customer interactions/managing of subcontracts/resources for marketing collateral- web site improvements) 	<p>See spreadsheet: 'CMUA SB1037 2011 Summary Tables and Analysis_CCSEVersion' for info on overhead costs compared to other utilities.</p> <p>See spreadsheet: ' PWP Incentive Comparison' for info on PWP incentives versus SCE, Burbank, and Glendale</p>

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Process	<p>Application Process</p> <ul style="list-style-type: none"> • Application could be made more user friendly • eQuest modeling costs per project seems reasonable (on average), but not every project should require modeling <p>Contractor and customer feedback</p> <ul style="list-style-type: none"> • EEP PM viewed as knowledgeable and competent • Responsiveness not always at adequate level • Limited staffing seen as a challenge • Web-site seen as difficult to navigate • Flexibility in types of projects incentivized is a strength • Application seen as overly complicated by some customers and contractors 	<ul style="list-style-type: none"> • Streamline EEP Application <ul style="list-style-type: none"> • Apply lookup tables for lighting to make application more user-friendly Include all major technology areas- refrigeration for example • “Express Efficiency” type application for lighting and other technologies for which there are well documented savings would streamline application process • Have FAQs section on web site • Determine and reward EE goals for account managers • Provide customers easier access to electricity usage data to help them make better EE decisions <p>DIP (SBAID) Program Design</p> <ul style="list-style-type: none"> • Audit process should be in more of a checklist format - i.e. lighting opportunities, HVAC, refrigeration- in order to identify businesses to target • For fairness, have an opt-in option to SBAID program advertised on web site. Will have to weigh “fairness” against transportation costs of hitting geographically disparate businesses. 	<p>For example of lighting table, see spreadsheet: ‘Example of Lighting Lookup Table’</p> <p>For example of Express Efficiency type program, see:</p> <p>SCE http://www.sce.com/business/ems/express_solutions.htm</p> <p>LADWP http://www.ladwp.com/ladwp/cms/ladwp000572.jsp</p> <p>For example of easy customer access to energy usage information, see SDG&E’s Energy Waves http://www.sdge.com/residential/energywaves.shtml</p>

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<p>Data Management and Reporting</p>	<p>Data Management Challenges</p> <ul style="list-style-type: none"> • Inconsistent tracking of market segment and project type • Data fields are not consistent with PWP customer database • Data fields are not consistent with CEC reporting requirements <p>Internal Reporting</p> <ul style="list-style-type: none"> • It is unclear to what degree broader customer participation should be prioritized for PWP's commercial EE program • The TRC and PAC metrics do not give adequate information on customers' economic incentive to participate in the EEP program <p>External Reporting</p> <ul style="list-style-type: none"> • CEC is not aware of EM&V activities that PWP is undertaking • CEC needs to do a better job of articulating what their expectations are of adequate EM&V 	<p>Data Management</p> <ul style="list-style-type: none"> • Establish market segment/project type categories and stick to them • Ensure market segments/project types in program database consistent with CEC reporting categories • Track contractor/account holder/property manager information separately • Track customer size/annual usage in commercial EE program database • Include contact information (phone and email) in database <p>Internal Reporting</p> <ul style="list-style-type: none"> • Establish what are your key performance metrics <ul style="list-style-type: none"> • Is it just cost? • Impact/Scope? • TRC/PAC tracking is good, add PCT (participant cost test) to better understand to what degree incentives are providing positive economic return for customers <p>External Reporting</p> <ul style="list-style-type: none"> • Provide summary to CEC about PWP's current efforts (data loggers, 3rd party eQuest modeling, on-site verification, residential lighting EM&V efforts) • Burbank EM&V report and Summit Blue 2009 EM&V recommendations give guidance on what needs to be done • Clarify expectations from CEC 	<ul style="list-style-type: none"> • Burbank's EM&V Report is available at: http://www.ncpa.com/energy-efficiency-m-v-reports-2.html <p>CEC Key Contact: Kae C. Lewis Electricity Supply Analysis Division California Energy Commission 1516 Ninth Street Sacramento, CA 95814 phone: 916-654-4176 fax: 916-654-4304 email: klewis@energy.state.ca.us</p>

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<p>Marketing</p>	<ul style="list-style-type: none"> • Print Ads have been consistent and well targeted to Pasadena audience • Web interface should be more direct and user-friendly • Relationships with key accounts have been critical • Workshops have been geared for a technically sophisticated audience and have been technology-focused 	<p>Key Account Relationships</p> <ul style="list-style-type: none"> • Continue to nurture key account relationships, provide consistent contact regarding energy efficiency opportunities • Leverage key account relationships to achieve savings, perhaps formalize “Energy Partner” status to encourage program participation • Consider staff limitations –staff resource constraints makes relationship and program management difficult <p>Web Site/Online Presence</p> <ul style="list-style-type: none"> • Improve web site interface, fewer steps to get to commercial EE information from PWP home page <p>Surveys</p> <ul style="list-style-type: none"> • Include more EE awareness/motivation questions in next customer satisfaction survey <p>Messaging/Targeting Customers</p> <ul style="list-style-type: none"> • Target workshops/materials by sectors tailored to your customer base rather than by technology type • Make sector-specific marketing materials available with case studies demonstrating success <p>Provide information/trainings/messaging specific to key market segments in Pasadena</p> <p>PWP Web-site can serve as portal to other resources, coordinate with SCPPA/CEC “Energy Efficiency Portal” and other efforts:</p> <ul style="list-style-type: none"> • ASHRAE sector guides • Energy Star Small Business • NREL resources • Coordinate with SCPPA • Contractors have PWP case studies, highlight them 	<p>For suggested survey questions, see MS Word document entitled: “Potential EE Questions for next Commercial Customer Survey.docx”</p> <p>ASHRAE Advanced Energy Guides http://www.ashrae.org/technology/page/938</p> <p>Energy Star Small Business Resources http://www.energystar.gov/index.cfm?c=small_business.sb_index</p> <p>NREL Case Studies http://www.nrel.gov/buildings/comm_building_design.html#case_studies</p>

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Budgeting	<ul style="list-style-type: none"> • Meeting PSI goals will put significant pressure on EE program budget • PSI and EE budget conflicts are inconsistent with SB1- SB1 programs should not impinge upon “cost-effective” energy efficiency programs 	<p>Ensure that budget is aligned with program objectives</p> <ul style="list-style-type: none"> • Broadening EE program participation will cost more <p>Cost per kWh target for EEP</p> <ul style="list-style-type: none"> • If EEP cost per kWh target is too low, limits project types, particularly HVAC cooling which is important for peak load reduction <p>Incentives</p> <ul style="list-style-type: none"> • Current PWP incentive rates appear high, but we were unable to do a thorough evaluation of incentive-setting process/tool because we did not receive it from staff in time • Consider lowering incentives (\$/kWh and \$/kW), shifting more resources to M&O activities to broaden program participation 	<p>See budget planning tool - spreadsheet “CCSE PBC EE Budget Model” in project folder</p>