ENERGY EFFICIENCY

IN CALIFORNIA'S PUBLIC POWER SECTOR

A 2016 STATUS REPORT

A PUBLIC AGENCY
NCPA
NORTHERN CALIFORNIA POWER AGENCY

CALIFORNIA MUNICIPAL UTILITIES ASSOCIATION

SCPPA

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Project Managers: Jonathan Changus, Northern California Power Agency (NCPA)
Bryan Cope, Southern California Public Power Authority (SCPPA)

NCPA	SCPPA
Meredith Owens & Kelly Birdwell, Alameda Municipal Power	Phil Hayes, Earl Lasley & Ed Murdock, Anaheim Public Utilities
Marlee Mattos, City of Biggs	Paul Reid, Azusa Light & Water
Meg Patterson, City of Healdsburg	Jim Steffens & Veronica Craghead, City of Banning
Adam Brucker, City of Lodi	Jeanette Meyer & Kapil Kulkarni, Burbank Water & Power
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Christine Tam, Bruce Lesch & Lena Perkins, City of Palo Alto Utilities	Craig Kuennen & Herbert Garcia, Glendale Water & Power
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Nicolas Procos, Port of Oakland	Lucia Alvelais, Paul Costa & David Jacot, LADWP
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Martin Bailey & Renee Laffey, Roseville Electric	Kevin Palmer & Rebecca Cortez, Riverside Public Utilities
Mary Medeiros McEnroe, Silicon Valley Power	Anthony Serrano, City of Vernon Light & Power
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Miranda Boutelle & Mark Gosvener, Efficiency Services Group (Cities of Gridley, Lodi, Shasta Lake & Ukiah)	
CMUA	
Michael TenEyck, City of Corona	Trina Valdez, City of Rancho Cucamonga
Vanessa Lara, Merced Irrigation District	Rachel Radell-Harris, Sacramento Municipal Utility District
Theresa Phillips, Lassen Municipal Utility District	James Hendry & Lori Mitchell, San Francisco PUC
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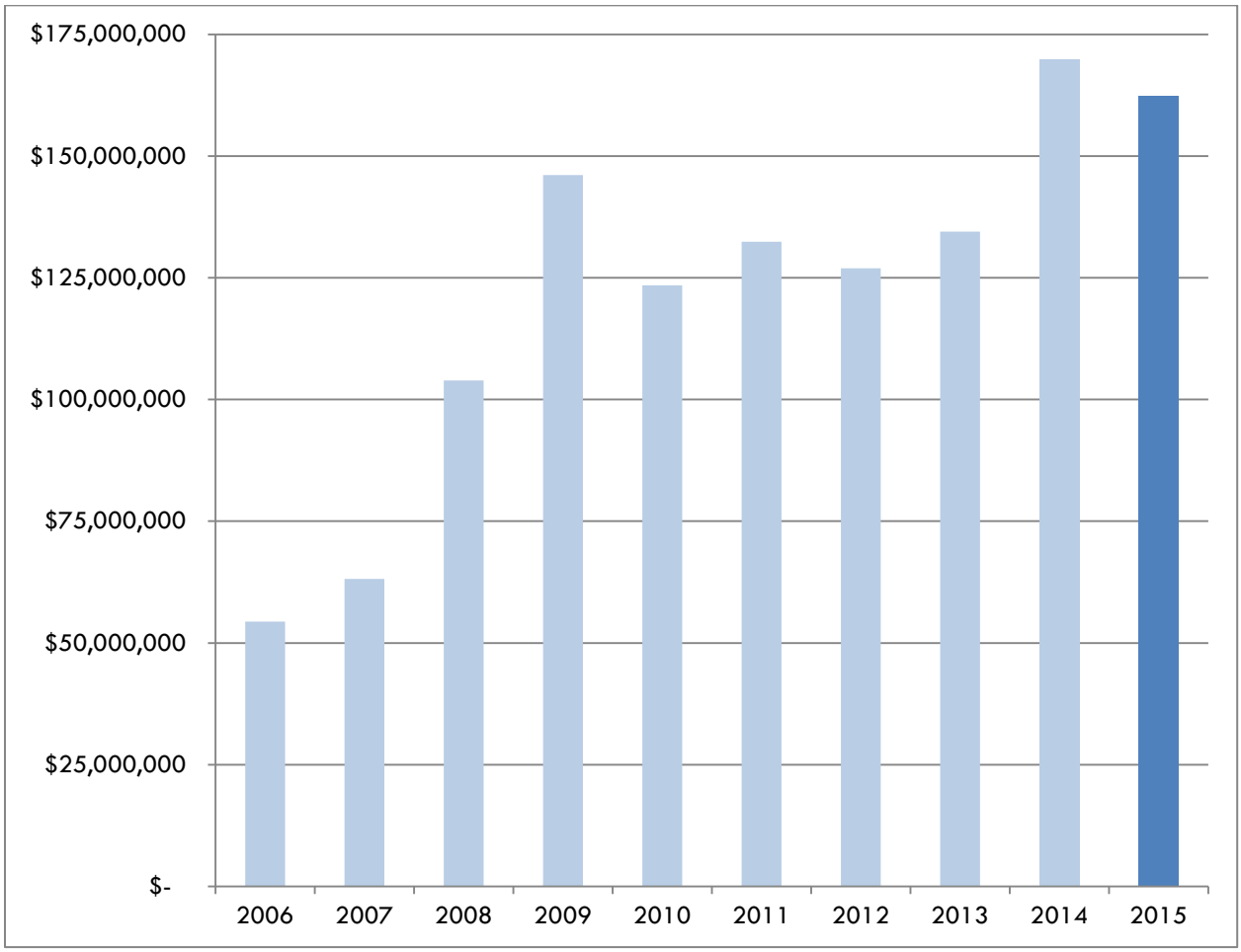
1. EXECUTIVE SUMMARY

The California Municipal Utilities Association (CMUA), the Northern California Power Agency (NCPA), and the Southern California Public Power Authority (SCPPA) are pleased to submit this report, *Energy Efficiency in California's Public Power Sector: A 2016 Status Update.*

CMUA, NCPA, and SCPPA have worked collaboratively since October 2005 to measure energy efficiency program effectiveness and report savings in a consistent and comprehensive manner. In December 2006, the first joint report on energy efficiency was submitted to the California Energy Commission (CEC). This tenth report explores the latest results from public power's wide range of energy efficiency programs.

Public power's long-standing commitment to energy efficiency is an extension of fundamental principles dedicated to social and environmental responsibility, ensuring reliability, and keeping rates low for the communities they serve. While customer participation levels in individual utility programs varies from year to year, collectively publicly owned utility (POU) programs incentivizing customer investments in energy efficiency have totaled over $100 million annually since 2008.

Total Program Expenditures, 2006-2015



As discussed further in Chapter 7: Conclusions & Policy Considerations, the principal findings and conclusions of this analysis for FY14/15 are as follows:

- Sustained Investment: POUs spent over $162 million on energy efficiency programs. This represents public power's eighth consecutive year exceeding $100 million threshold and second only to last year as the highest single-year expenditure.

- Record-Setting Savings: POUs set new annual records for Gross Peak Savings (132.5 MW), Gross Annual Energy Savings (681.9 GWh), and Gross Lifecycle Savings (8,211.6 GWh). These totals represent significant gains over any prior year's results.

- $1.2 Billion Success: Since 2006, POUs have invested over $1.2 billion in energy efficiency programs, reduced peak demand by more than 846 megawatts, and achieved more than 4.5 million MWh in annual savings.

Summary of Programs, 2006-2015

Year	Peak kW Savings	Annual MWh Savings	Lifecycle MWh Savings	Total Utility Expenditures ($)
FY05/06	52,552	169,303	2,249,214	$ 54,412,728
FY06/07	56,772	254,332	3,062,361	$ 63,151,647
FY07/08	82,730	401,919	4,473,801	$ 103,907,266
FY08/09	117,435	644,260	6,749,912	$ 146,093,107
FY09/10	93,712	522,929	5,586,299	$ 123,433,250
FY10/11	81,121	459,459	4,604,364	$ 132,372,795
FY11/12	82,561	439,710	4,638,521	$ 126,936,631
FY12/13	89,305	521,478	5,722,100	$ 134,475,230
FY13/14	110,437	625,187	6,413,468	$ 169,901,735
FY14/15	132,500	681,943	8,211,596	$ 162,896,993
TOTAL	**846,572**	**4,551,217**	**49,462,422**	**$ 1,217,581,382**

- Cost-Effectiveness: Applying the Total Resource Cost (TRC) societal test, the aggregated TRC for public power is 2.02 in FY14/15. The Program Administrator Cost (PAC) test also yielded a positive aggregate score of 5.98 for all POU programs.

- Most Savings: Lighting continues to be major source of savings for public power energy efficiency programs with residential and non-residential programs accounting for 41.2% of the total gross annual savings. However, this is a lower share of the savings than in previous years.

- Efficacy of Programs: The cost per net kWh saved over the lifetime of all measures is $0.027/kWh for all of public power.

2. INTRODUCTION

Legislative & Statutory Requirements

Three pieces of legislation govern the compilation of this report. Senate Bill 1037 (Kehoe, 2005), requires POUs to annually report to its customers and the CEC on its investments in energy efficiency and demand reduction programs. Assembly Bill 2021 (Levine, 2006) directs POUs to identify all potentially achievable cost-effective, reliable, and feasible electricity efficiency savings and establish 10-year statewide energy efficiency savings targets. Assembly Bill 2227 (Bradford, 2012) changed the frequency of the energy efficiency 10-year target setting requirements from once every three years to once every four years.

In particular, this report is provided to the CEC in compliance with §9505 of the Public Utilities Code:

> *9505. (a) By March 15, 2013, and by March 15 of each year thereafter, each local publicly owned electric utility shall report to the Energy Commission and to its customers all of the following:*
>
> *(1) Its investments in energy efficiency and demand reduction programs.*
>
> *(2) A description of each energy efficiency and demand reduction program, program expenditures, cost-effectiveness of each program, and expected and actual energy efficiency savings and demand reduction results that reflect the intent of the Legislature to encourage energy savings and reductions in emissions of greenhouse gases resulting from providing service to existing residential and nonresidential buildings, while taking into consideration the effect of the program on rates, reliability, and financial resources.*
>
> *(3) The sources for funding of its energy efficiency and demand reduction programs.*
>
> *(4) The methodologies and input assumptions used to determine the cost-effectiveness of its energy efficiency and demand reduction programs.*
>
> *(b) By March 15, 2013, and by March 15 of every fourth year thereafter, each local publicly owned electric utility shall identify all potentially achievable cost-effective electricity efficiency savings and shall establish annual targets for energy efficiency savings and demand reduction for the next 10-year period. A local publicly owned electric utility's determination of potentially achievable cost-effective electricity efficiency savings shall be made without regard to previous minimum investments undertaken pursuant to Section 385. A local publicly owned electric utility shall treat investments made to achieve energy efficiency savings and demand reduction targets as procurement investments.*
>
> *(c) Within 60 days of establishing annual targets pursuant to subdivision (b), each local publicly owned electric utility shall report those targets to the Energy Commission, and the basis for establishing those targets.*
>
> *(d) Each local publicly owned electric utility shall make available to its customers and to the Energy Commission the results of any independent evaluation that measures and verifies the energy efficiency savings and the reduction in energy demand achieved by its energy efficiency and demand reduction programs.*

Outline of the Report

Nearly forty utilities detail their energy efficiency activities in this document. These POUs provide more than 25 percent of the retail customer electric load served in California and implement energy efficiency programs to support these customers. Beyond the informational requirements described in the abovementioned statute, this document is designed in a manner that provides a comprehensive assessment that can be utilized by state policymakers and interested stakeholders to gauge the effectiveness of energy efficiency programs within the public power community.

Chapter 3: Overview of Energy Efficiency and Public Power describes public power's unique perspective regarding energy efficiency and the role customer programs play in our communities. The chapter explores economic factors that directly influence customer decisions to participate in utility programs and invest in energy efficiency improvements. In addition, this chapter also identifies key differences among POUs and the respective customers they serve.

Chapter 4: Methodologies & Assumptions provides a description of the methodologies used by the public power community to report energy savings from different measures and programs.

Chapter 5: Investments in Energy Efficiency Programs offers a summary of utility expenditures and energy savings stemming from customer programs. This chapter highlights the range of POU programs currently available to customers. Descriptions of individual utility programs can be found in Appendix A.

Chapter 6: Evaluation, Measurement, and Verification discusses POU commitment to independent, third-party, evaluation, measurement and verification (EM&V), as well as current POU EM&V activities. Additional information regarding EM&V activities is included in the utility narratives in Appendix A.

Chapter 7: Conclusions & Policy Considerations synthesizes the collective expertise of public power into recommendations on how to achieve additional energy savings. With the passage of SB 350 and the Governor's goal of doubling energy savings by 2030, it is imperative that the CEC, POUs, local planning departments, energy service companies, contractors, building owners, and other stakeholders work in a more coordinated manner to foster customer investments in energy efficiency improvements. This chapter identifies opportunities and likely barriers to future energy efficiency efforts.

Appendix A is a compendium of POU program data, including a description of each utility and their energy efficiency programs, as well as categorized summaries of energy savings and utility investments by program. In addition, this appendix describes EM&V funding and activities.

Appendix B summarizes the 10-year energy savings targets adopted by POUs, based on the Energy Efficiency Resource Assessment Model tool developed by Navigant to support target-setting efforts, for FY2014-2023

3. Overview of Energy Efficiency and Public Power

3.1 A Public Power Perspective

The long-standing commitment of California's POUs to energy efficiency and demand reduction programs is an extension of fundamental principles dedicated to social and environmental responsibility, ensuring reliability, and keeping rates low for our communities. POUs are not-for-profit public agencies similar in structure to other municipal utility services such as water, sewer, and waste management. POUs are governed by locally- elected boards and are answerable to the very customers they serve. Energy efficiency is a critical element of the resource planning process for generation, transmission, distribution, and demand-side management resources. Public power's commitments to energy efficiency are guided by four important concepts:

- Social and Environmental Responsibility: POUs place a high priority on energy efficiency, as well as renewable power supplies, low-income programs, and economic development. Local elected officials govern public power to ensure accountability on these issues to customers.
- Operational Efficiency: Public power offers important programs to reduce and/or shift peak demand to optimize generation and transmission, and ensure more efficient operation of the grid.
- Demand-side Energy Efficiency: This is a major focus of POUs. It includes, but is not limited to: appliances, air-conditioners, building codes and standards, education, electricity management, and weatherization, all coordinated with customer-specific programs.
- Cost-effective Energy Efficiency: Cost-effective energy efficiency lowers the cost of providing electricity to our communities. POU customers are "shareholders" and benefits related to energy efficiency are realized by all customer-owners.

POU energy efficiency programs are extensive and comprehensive. Residential programs focus on energy audits, Energy Star® appliance rebates and replacements, lighting improvements, attic insulation, as well as incentives to install highly-efficient heating, ventilation and air conditioning (HVAC). Commercial and industrial programs target lighting, HVAC, and manufacturing/food processing equipment. POUs also partner with schools and public institutions to educate residents and implement a variety of beneficial programs. POUs across the state are currently evaluating and developing more advanced programs in the areas of commercial/industrial demand response, thermal energy storage, on-bill financing, customer behavior change, and "whole building" retrofits.

POUs maintain a rich tradition of customer service that is distinctly local. POUs maximize the success of energy efficiency programs and services because of their unique relationships with customers and their ability to tailor programs to meet the specific needs of their communities. While harnessing the advantages of global innovations, and in many cases helping advance emerging energy technologies through progressive programs and procurement, POUs are responsive to local concerns, allowing them to maximize the value of all energy efficiency programs.

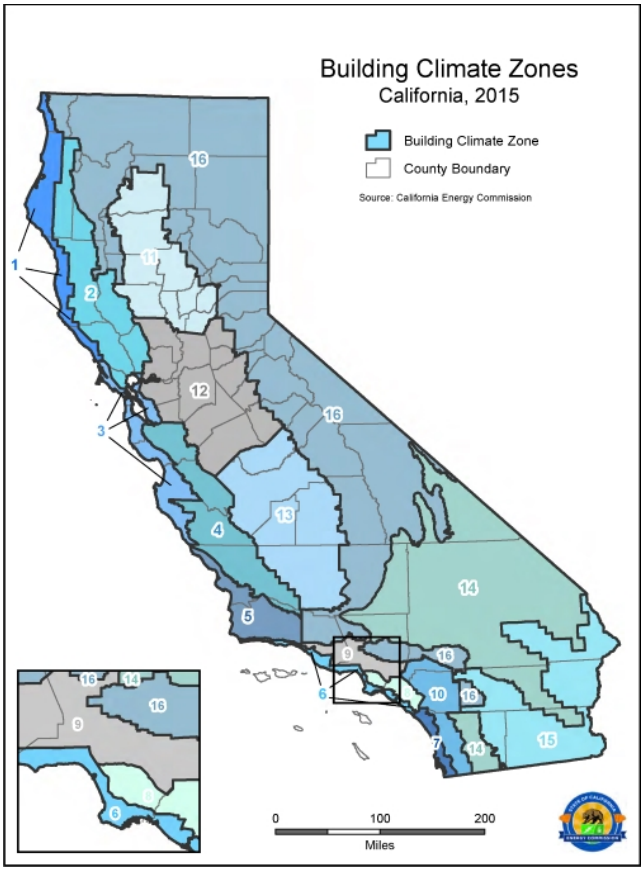
3.2 Diversity with a Common Objective

POUs serve a diverse range of customers. Effective utility energy efficiency programs need to be tailored to the specific interest of individual POU communities. Key factors that distinguish POUs and their customers include climate zone, customer class, overall size of the utility and local economic conditions. Common to all POUs is the desire to create programs that are effective, innovative, and invest in effective energy efficiency measures, technologies, and programs to optimize benefits in their local communities.

Climate Zones

California is divided into 16 separate and distinct climate zones, defined by a range of characteristics, including summer temperature range, record temperature highs and lows, annual precipitation, and seasonal differences. California's POUs can be found in 13 of the 16 climate zones, ranging from Truckee Donner over the Sierra Crest to Merced in the heart of the Central Valley to downtown Los Angeles, the nation's second largest city. With such a wide geographic footprint, public power utilities recognize the importance of unique programs and tailor their programs to best serve the needs of their local communities.

Figure 1. California Climate Zones



Climate Zone is one of the primary factors driving utility energy efficiency program design. Customer heating and cooling needs vary significantly among climate zones. As a result, the energy savings from HVAC retrofits differ dramatically across utilities and climate zones.

For example, an HVAC retrofit in the City of Needles in Climate Zone 15 – characterized by extremely hot and dry – yields considerably greater energy savings than a similar HVAC retrofit in a cooler coastal community like Lompoc (Climate Zone 5).

The climatic conditions that make for a cost-effective energy efficiency investment in one utility service territory may not necessarily make sense for a similarly situated customer of another utility.

Customer Class

Customer class distributions vary from utility to utility, which also impacts energy efficiency planning and program efforts.

Figure 2 to the right illustrates that the share of retail sales attributable to residential customers across the POUs varies considerably. Collectively, non-residential customers constitute two thirds of the retail sales (66.6%) for all POUs.

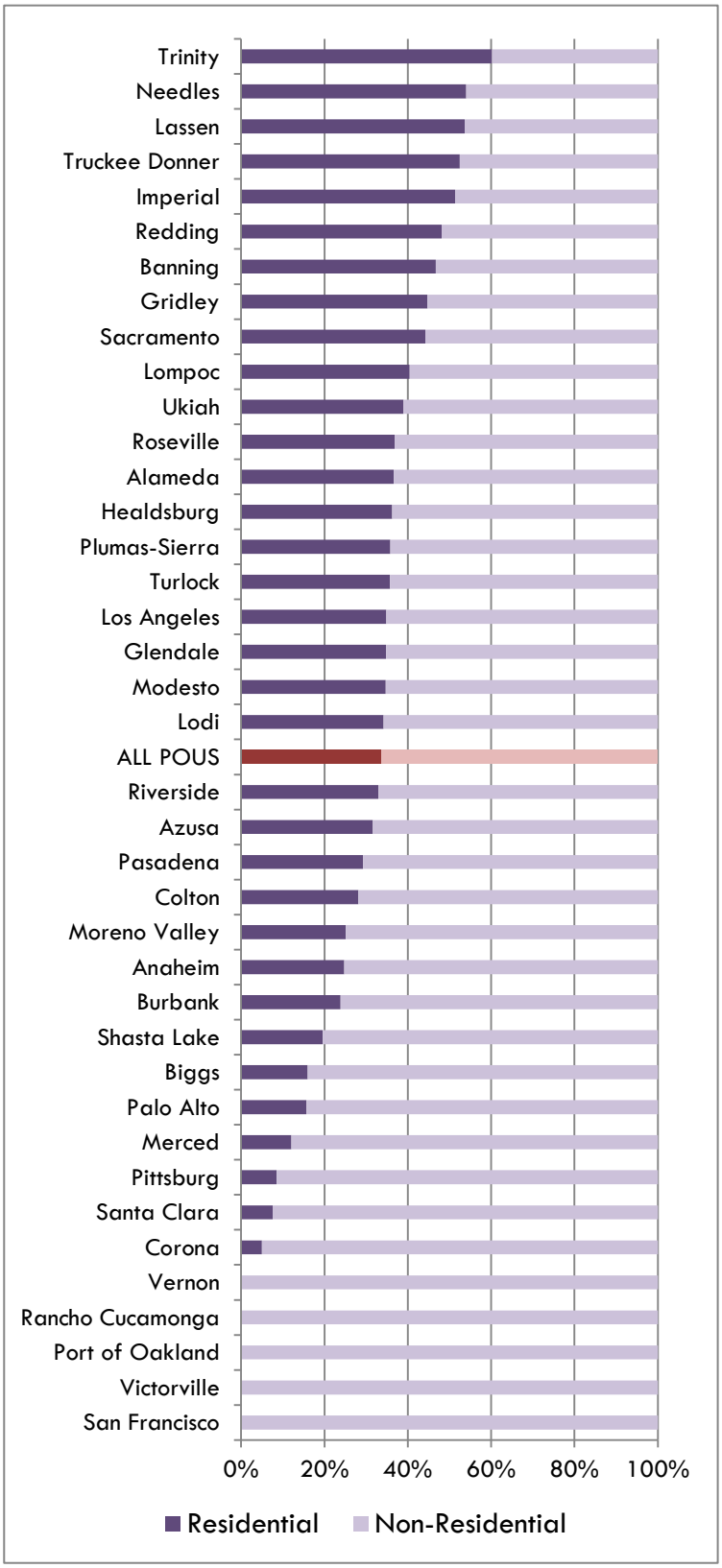
Non-residential customers, in general, consume more energy per account than residential customers. Nowhere is this dynamic more obvious than in Biggs where a single industrial customer represents 66% of the annual retail sales.

Important differences exist even among utilities with similar customer class distributions. Moreno Valley is a relatively new POU and started serving customers in 2004 with facilities about ten years old or newer. By comparison, Modesto has provided electric service for more than 100 years and has older building stock with different energy efficiency opportunities.

The Port of Oakland serves arguably the largest electric vehicle load of all POUs – large shipping vessels. The Port of Oakland loads and discharges more than 99% of the containerized goods moving through Northern California, the nation's fourth largest metropolitan area.

For more information on the innovative programs offered by each utility, see Appendix A.

Figure 2. Residential vs. Non-Residential Sales



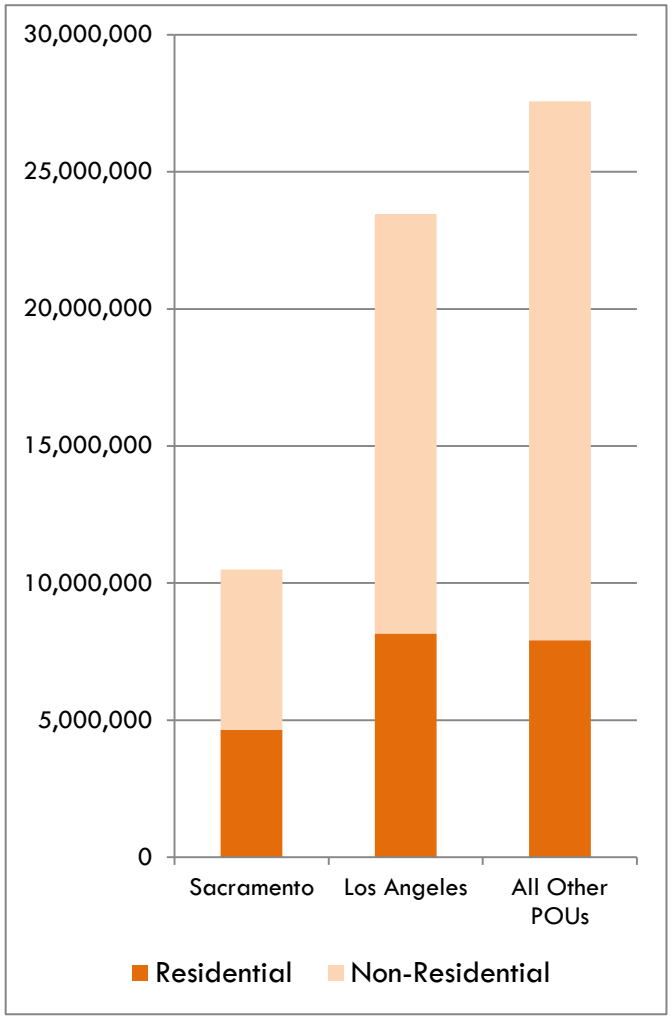
Utility Size – Annual Retail Sales

POUs vary a great deal in size and this impacts the energy efficiency programs each offers. Larger utilities typically serve customers with a broader range of energy needs than smaller utilities. As such they will offer a larger portfolio of incentives and rebates. In contrast, smaller utilities with fewer overall customers and customer types focus on more limited offerings.

At the large end of the POU spectrum are the Los Angeles Department of Water and Power (LADWP) and the Sacramento Municipal Utility District (SMUD). Together, LADWP and SMUD represent over half (55.2%) of POU retail sales in 2014. The ten largest POUs account for the lion's share of retail sales (84.3%).

On the other end of the spectrum are POUs serving much smaller communities, such as the Pittsburg Power Company and the City of Biggs. The ten smallest POUs were less than one percent of total retail sales (0.98%) in 2014.

Figure 3. Retail Sales by POU (MWh)



Utility Size is important to consider as retail sales reflect a utility's resources for managing energy efficiency programs and reporting results to policymakers and stakeholders.

Program administration can be a challenge for smaller utilities with limited resources. In some cases, a utility may have a single staff member manage their energy efficiency programs, among other duties.

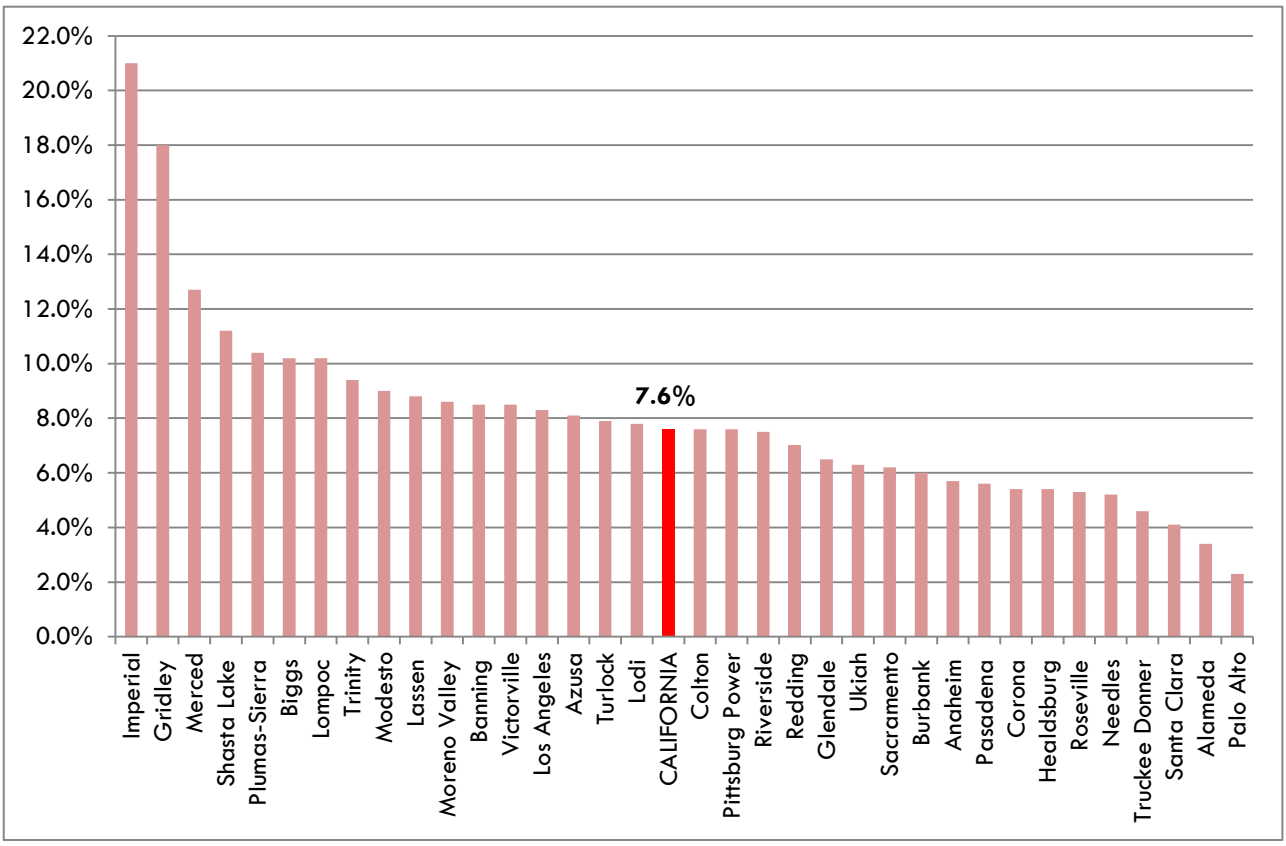
The collaborative nature of the public power community allows for the development of joint resources and sharing of best practices. CMUA, NCPA, and SCPPA serve as forums for discussing and pursuing projects on behalf of groups or all POUs.

The tools developed to support this report's compilation are an example of POU collaboration. For more information on the report tools, see **Chapter V: Methodologies & Assumptions.**

Local Economic Factors

The state of the local economy, as a reflection of customer purchase power, also informs utility decision-making about which programs deploy. Many POU communities are located in areas with unemployment rates higher than the state average in 2014. Imperial Irrigation District (21%) and the City of Gridley (18%) serve constituents with the highest rate of unemployment. In contrast, a Bay Area enclave – the Cities of Palo Alto (2.3%), Alameda (3.4%), and Santa Clara (4.1%) – all serve communities that are riding the recent wave of economic recovery and serve communities with unemployment rates well below the state average.

Figure 4. POU Community Unemployment Rates, 2014 Average



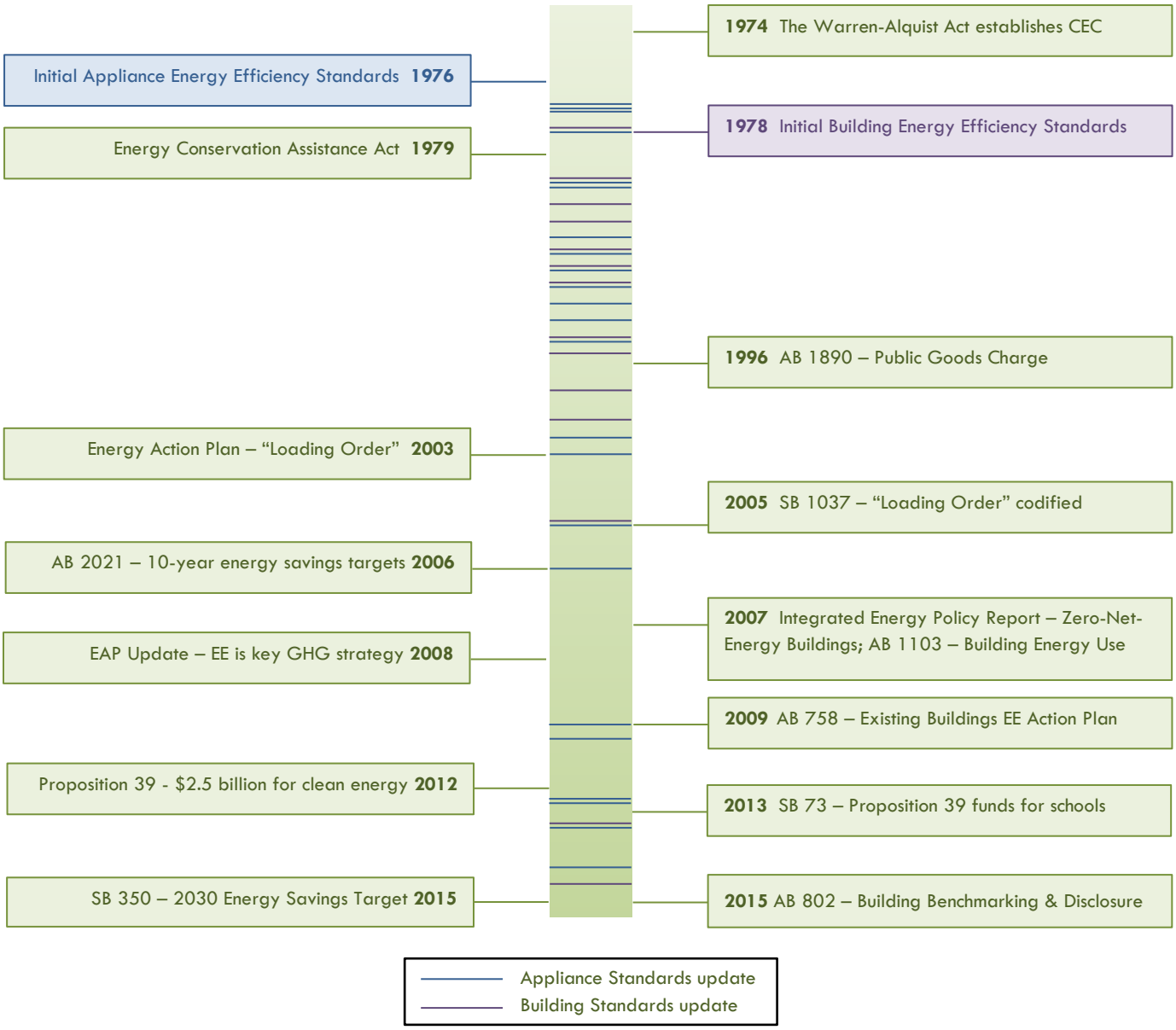
Source: California Employment Development Department

Economic vitality empowers customers to invest in distributed energy resources, including energy efficiency, rooftop solar systems, and electric vehicles. Just as flourishing job markets can spur customer-funded and utility supported clean energy retrofits, struggling local economies may limit the ability of other customers to make similar investments. Customers with a lack of disposable income and/or access to low-interest financing are often precluded from making energy efficiency investments, even if those investments require little upfront capital and would produce energy savings that would pay for itself in a short timeframe. For recommendations on how POUs, the State, and a broad range of stakeholders can collaborate to support customer investments in clean energy, see Chapter 7: Conclusions & Policy Considerations.

3.3 Complementing Statewide Efforts

The 2015 report noted that public power programs are one of the many facets of the state's efforts to reduce energy use. With that idea in mind, SB 350 was signed into law to codify Governor Brown's goal of doubling the forecasted energy savings by 2030. The CEC is tasked with developing annual statewide targets for energy efficiency savings and demand reduction savings from a range of energy efficiency demand response programs, including POU programs. As Figure 5 illustrates, California has promoted energy efficiency for nearly 40 years – a strong tradition on which SB 350 seeks to build upon.

Figure 5. Timeline of Major Energy Efficiency Initiatives in California



Title 20 & Title 24 Energy Efficiency Standards

Since its creation nearly 40 years ago, the California Energy Commission (CEC) has been tasked with prescribing standards for minimum levels of operating efficiency and promoting the use of energy and water efficient appliances through the Appliance Energy Efficiency Standards (Title 20). In addition, the CEC prescribes building standards that increase the efficiency in the use of energy and water for new building construction through the Building Energy Efficiency Standards (Title 24).

As depicted in Figure 5, the initial Title 20 appliance standards were adopted in 1976. Between 1977 and 2010, the CEC adopted 21 updates to the Title 20 standards. Similarly, the initial Title 24 building standards were issued in 1978. Between 1980 and 2013, the CEC adopted 12 updates to the Title 24 standards. The CEC estimates that since their inception, Title 20 appliance standards and Title 24 building standards have saved California consumers over $37 billion and $30 billion respectively.

Appliance and building standards have been and will continue to be one of the state's most successful energy and environmental policies, and POUs support ongoing efforts to systematically adopt cost-effective and feasible building and appliance standards updates.

There is a direct relationship between energy savings from Codes & Standards (C&S) updates and POU customer incentive programs. The adoption of more stringent standards serves to transform the marketplace and eliminate less efficient options for consumers. While more energy savings are attributable to Title 20 and Title 24 updates, utility energy efficiency portfolios are anticipated to begin to decline as the Unit Energy Savings for rebated measures is reduced. This has different consequences for POUs than IOUs.

The state's three large investor-owned utilities (IOUs) fund the vast majority of the research on which updates to the appliance and buildings energy efficiency standards are based. The CPUC stated in D. 05-09-043 that, "Using ratepayer dollars to work towards adoption of higher appliance and building standards may be one of the most cost-effective ways to tap the savings potential for energy efficiency and procure least-cost energy resources on behalf of all ratepayers." IOUs not only fund but also claim energy savings from the adoption of new appliance and building standards; historically, POUs have neither resourced development, nor claimed savings from the updates to Title 20 and Title 24. Yet, the impacts to POU customer incentive programs are very much the same as IOU programs.

POUs are now beginning to play a more active role in the development, evaluation, and adoption of updates to Title 20 and Title 24 standards as well. The challenge for many POUs is that cost to undertake the necessary research to support the adoption of new appliance or building codes exceeds their total energy efficiency budgets. However, with larger POUs, such as LADWP and SMUD currently engaged in the CEC C&S processes, smaller utilities are exploring opportunities through joint action to partner on future updates. As a general practice, POUs report savings from C&S if they provide resources to support the development and/or enforcement of a C&S update, which will be noted in their narratives in Appendix A: Description of Utility Programs.

Figure 6. California's Key Energy Efficiency Programs

AB 802 Building Energy Use

Building owners can request usage data from utilities for all accounts in their building to guide decisions regarding EE improvements to their facilities.

Prop 39 CA Clean Energy Jobs Act

Schools and community colleges are eligible for state funds that can complement utility incentives for EE upgrades and retrofits.

Utility Incentive & Rebate Programs

By providing financial incentives, utilities spur voluntary customer investment in energy saving devices, appliance, and upgrade to their home and office.

Title 20 & Title 24 Codes & Standards

The foundation of EE policy in California. More stringent C&S updates reduce the Unit Energy Savings for measures rebated through utility customer programs.

Zero Net Energy (ZNE) Buildings

The goal is for new residential buildings by 2020, and non-residential buildings by 2030, to be ZNE vis a vis EE standards and renewable distributed generation.

AB 758 Existing Buildings EE Action Plan

This comprehensive plan looks beyond utilities and proposes a range of strategies to foster customer investment in improving existing building stock

Property Assessed Clean Energy

This financing mechanism allows homeowners to avoid the upfront costs of an EE retrofit by repaying the costs through a property assessment over time.

Public power actively participates in the many different forums, workshops, and proceedings associated with these programs to provide perspective and feedback from our diverse communities. Many of the program areas overlap, facing similar challenges and sharing similar opportunities. Achieving the state's visionary energy efficiency goals, and realizing the attendant greenhouse gas emissions reductions and other non-energy benefits, requires a great deal of collaboration among stakeholders and coordination among programs. POUs look forward to continuing to work with the CEC and the growing universe of stakeholders on the successful implementation of these programs.

4. METHODOLOGIES & ASSUMPTIONS

This section provides a brief overview of the analytical tools developed by the public power community to report its energy efficiency savings and develop energy efficiency targets, as well as activities being undertaken to further refine the processes used to verify reported savings. In evaluating public power energy efficiency programs it is absolutely critical to understand how energy savings estimates attributed to programs are interpreted and measured.

As a practical matter, energy savings attributable to utility energy efficiency programs are defined as the difference between the expected energy use of a proposed efficiency measure and expected energy use under baseline conditions and assumptions. In most cases, baseline energy usage is governed by the Title 20 and Title 24 energy efficiency standards, as well as Federal Appliance Standards. For some custom projects, these standards do not apply, so industry standard practice is used for the baseline.

Database for Energy Efficient Resources

The Database for Energy Efficient Resources (DEER) is a CEC and California Public Utilities Commission (CPUC) sponsored database designed to provide well-documented, verifiable and consistent estimates of energy and peak demand savings values, measure costs, and effective useful life (EUL) from one data source. DEER accounts for the new baselines established through the Title 24 building standards, as well as new federal energy standards. For consistency, POUs have historically used the DEER.

As noted in the draft *2014 DEER Update Study,* a number of stakeholders have expressed concerns with the DEER database. Several parties voiced concern when a large number of measures that were originally included in DEER2005 were removed as part of the 2011 DEER update. The parties argued that some of those measures are still prominent in program accomplishments and requested that updates to restore the measures be included in DEER as soon as possible. IOUs also expressed concern that DEER measure definitions sometime lag current industry standards.

In response to both the removal of measures in 2011 and the definitions lagging industry standard, IOUs have relied upon their own workpapers to provide energy savings estimates that are more representative than the DEER database. In some cases, measures covered by an IOU workpaper may comprise a large portion of the portfolio of savings. In short, DEER, the estimated energy savings tool or resource that was funded by IOUs, to be used by IOUs, is not being used by the IOUs due to its serious shortcomings.

POUs share many of the concerns voiced by IOUs and other stakeholders regarding the DEER database. For many measures, the DEER database continues to provide energy savings estimates that align with results from POU EM&V reports of their programs. However, for other programs the estimated DEER savings are not consistent with the actual measure and program results, so POUs must rely on other sources or studies. The process in which DEER is updated and the basis on which changes to the DEER database are made are not transparent – at least not to public power.

Technical Reference Manual

Recognizing that the DEER database is not a viable resource for public power to continue to use, POUs contracted for the development of a technical reference manual (TRM) modeled after the Northwest Regional Technical Forum resource in 2013.

Silicon Valley Power first initiated a project to develop an energy savings estimate database specific to their respective programs as an alternative to DEER. Energy & Resource Solutions (ERS) was retained to develop the TRM solely for Silicon Valley Power, which was later expanded by Palo Alto Utilities to include additional measures specific to their programs as well. The 12 remaining members of NCPA, all 11 SCPPA members, and 7 CMUA members, including SMUD, then contracted with ERS for a larger TRM tool that could be used by utilities in different climate zones across the state. The TRM was completed last spring and replaced DEER as the basis for which many POUs based their energy efficiency programs.

The TRM provides the methods, formulas, and default assumptions used for estimating energy savings and peak demand impacts from energy efficiency measures and projects in a very clear and open format. . The energy savings estimates are used to report program accomplishments and measure progress towards program goals. Energy efficiency measures are documented and classified as either unit energy savings (UES) measures, semi-custom measures, or custom measures. The manual includes both nonresidential and residential measures. Each measure type is presented in separate sections and grouped by technology type. Measure information is presented in a consistent tabular format.

The TRM includes the main manual as well as supporting spreadsheets. All references and data resources are identified in the table footnotes. The reference manual also includes spreadsheets that provide detailed and transparent measure calculations and, for semi-custom measures, energy savings calculators for estimating energy savings for project-specific measures. The measure spreadsheet includes summary tables for transferring measure savings data into the program's regulatory compliance reporting tool.

As needed, each section also contains supplementary tables and charts to provide additional measure details. Measures with multiple savings values (savings by size, building use, varying levels of efficiency, etc.) will have both savings and cost data listed in a supplementary table. The last section of the manual provides the custom measure protocol, which outlines a process for estimating and documenting custom measure savings.

Energy savings calculators are also provided as part of the reference manual. The calculators are Excel spreadsheet-based engineering models for estimating semi-custom measures per the described methodology. They provide a consistent, transparent, and user-friendly approach for estimating project-specific energy savings.

The TRM is accessible to the public via the CMUA website at http://cmua.org/energy-efficiency-technical-reference-manual. The TRM provides a much higher degree of transparency to POUs, policymakers, and interested stakeholders regarding the energy savings estimates underpinning public power's energy efficiency programs.

California Technical Forum

IOUs and POUs recognize a common need for transparent and technically-sound energy savings estimates. This is particularly true as utilities pursue energy savings from more complex systems-wide and whole-building retrofit projects. In addition to the development and maintenance of the TRM, public power has taken on a leadership role within the California Technical Forum (Cal TF).

The Cal TF, modeled on the Northwest Regional Technical Forum, is a collaborative of energy efficiency industry experts who use independent professional judgment and a transparent, robust process to review and endorse technical information related to California's energy efficiency portfolio. Led by the Natural Resources Defense Council, the Cal TF was created in 2014 by a broad group of stakeholders.

The mission of the Cal TF is "[t]o support the growth and success of energy efficiency through independent and transparent peer review of California energy efficiency values." It is organized as an independent body that supports IOU and POU energy efficiency programs by developing the energy savings estimates for different energy efficiency measures. To this end, one of the Cal TF's first projects will be to evaluate a select group of key measures from the POU TRM. In addition to evaluating the accuracy of the TRM data, the Cal TF will also consider the format, design, and best practices of the TRM as a model for which the build a similar statewide database for all utilities. Until such a time as there is a Cal TF resource appropriate for use by public power, POUs will continue to maintain and update the TRM. In addition, during 2015 the Cal TF will undertake the evaluation and determination of possible processes and tools to calculate energy savings "below code" using a standardized baseline of existing conditions, or something similar, as referenced above.

For more information on the California Technical Forum, visit their website at http://www.caltf.org/.

Energy Efficiency Reporting Tool

Since SB1037 was passed in 2005, public power has significantly invested in the development of tools and resources to use for reporting the results of their energy efficiency programs. The company Energy and Environmental Economics (E3) has provided public power with their considerable expertise in this effort.

The Energy Efficiency (EE) Reporting Tool is an Excel Spreadsheet developed by E3. It contains the TRM database of energy efficiency measures developed by Energy Resource Solutions (ERS). Utilities select the measures that best represent the programs they have implemented and enter the relevant data. E3 designed the EE Reporting Tool to minimize the data input required by the utilities. Relying on default values and assumptions contained in the EE Reporting Tool, utilities may enter as little as the number of units installed, the incentive provided to the customer and overhead costs to report meaningful results. Alternatively, utilities may modify or enter their own assumptions and create customized measures that better reflect their programs or service territory. The EE Reporting Tool then provides summary tables by program category that report the units installed, achieved savings, program costs and cost effectiveness.

E3 developed and maintains the Distributed Energy Resources Avoided Cost Model and E3 Calculator adopted by the California Public Utilities Commission (CPUC) to report on the cost-effectiveness of investor-owned utility (IOU) energy efficiency programs. The EE reporting tool is a simplified reporting tool that uses the same avoided costs and cost-tests adopted by the CPUC. To reduce file size and complexity, avoided costs and EE measure load shapes are represented using six time-of-use periods (rather than 8,760 hourly resolution). Also the TRM measures developed by ERS are a consolidated and representative subset of the much larger number of measures in the DEER database. Both of these simplifications make the model much simpler and more user-friendly than the E3 calculator for the diverse range of utilities within the public power community.

The avoided costs used to report IOU EE cost-effectiveness were last updated in 2011. More recent avoided costs have been developed for other proceedings. However, for consistency, the EE Reporting Tool for the public utilities uses the same avoided costs most recently adopted for the E3 Calculator for reporting by the IOUs. The avoided costs and load shapes in the EE Reporting Tool remain unchanged from the previous year. The methodology for calculating each of the respective cost-tests also remains unchanged.

The TRM measure database included this year replaces the previous measures developed by KEMA, which were tied to DEER. The ERS database includes measures for each climate zone that can be selected by individual utilities for inclusion in their reporting. The EE Reporting Tool matches 2011 DEER net-to-gross ratios based on measure type. TOU load shapes developed from the DEER load shapes used in the E3 Calculator are matched to EE measures based on measure type and climate zone. As in prior years, utilities may select from the measure database or enter “custom” measures specific to their program.

The program sectors and categories are also the same as in prior years based on CEC reporting requirements. The summary table has been expanded slightly to include both gross and net annual and lifecycle energy savings and to include both a portfolio level Program Administrator Cost-test (PAC) as well as Total Resource Cost-test (TRC) ratio. The summary table also reports GHG savings (in standard tons) based on marginal heat rates developed for and used in the CPUC adopted avoided costs. The value of avoided GHG emission are included in the TOU period avoided cost values in the EE Reporting Tool and are not reported separately.

5. Investments in Energy Efficiency Programs

This section provides an aggregate overview and discussion about current and future energy efficiency programs and savings that apply to California's public power utilities. A detailed overview of specific utility program descriptions, expenditures, and energy savings can be found in Appendix A.

Figure 7 provides a comprehensive summary of energy efficiency savings and an aggregated measure of cost effectiveness of all POUs. The table reveals a range of savings, which is largely a reflection of utility size and economic considerations. Five utilities alone - LADWP (39.0 MW), SMUD (26.7 MW), Roseville (13.7), IID (11.5 MW), and Anaheim (10.0 MW) - had gross peak savings of at least 10 MW and together totaled over 100 MW of peak savings. With regards to gross annual energy savings, LADWP alone reports over 296.3 GWh of gross energy savings, which represents 43.5% the total for public power.

Figure 8 reviews the aggregated results by program sector. Lighting programs once again account for the largest share of the annual energy savings (41.2%), although the share of savings attributable is decreasing. At the same time, overall savings are increasing, which indicates that POU programs are achieving savings beyond the bulb. Customer rebates account for the majority of program expenditures (58.5%), with the remaining costs (41.5%) dedicated to utility marketing, administrative costs, and evaluation, measurement, and verification (EM&V) efforts.

Figure 9 and Figure 10 summarize POU energy efficiency program savings and cost information for fiscal years 2006 through 2015.[1] During FY14/15, POUs spent over $162 million on energy efficiency programs, the eighth consecutive year utility energy efficiency investments have exceeded $100 million. When added to investments since the signing of SB1037, public power has spent over $1.2 billion on energy efficiency. Supporting those investments were reductions in gross peak demand of 132 MW as well as gross annual energy savings of more than 680,000 GWh over the course of the reporting year.

Figure 11 provides the FY14/15 data for the utilities with the highest gross annual energy savings. These 15 utilities provided 97.5% of the total amount reported by the entire POU community. The majority of energy efficiency program impacts reflect public power's two largest utilities: LADWP and SMUD. In order to understand the diversity within public power, it is important to recognize the energy efficiency program trends of the other POUs across the state.

Figure 12 compares the program results of LADWP and SMUD to all other POUs. During FY14/15, the remaining utilities spent over $47 million on energy efficiency programs and achieved the highest demand savings (66.7 MW) for the group in a single year.

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[1] Imperial Irrigation District, Merced Irrigation District, Modesto Irrigation District, Plumas-Sierra Rural Electric Cooperative, Sacramento Municipal Utility District, Turlock Irrigation District, and Truckee Donner Public Utility District all operate on a fiscal year that extends on a calendar year basis. As such, each utility's data for FY14/15 is actually calendar year 2015.

Figure 7. Summary of Utility Results, FY14/15

POU SUMMARY	Resource Savings Summary							Cost Summary			Cost Test Ratios		
Utility	Gross Coincident Peak Savings (kW)	Gross Annual Energy Savings (kWh)	Gross Lifecycle Energy Savings (kWh)	Net Coincident Peak Savings (kW)	Net Annual Energy Savings (kWh)	Net Lifecycle Energy Savings (kWh)	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)	PAC	TRC	Utility ($/kWh)
Alameda	1,892	2,954,402	24,239,432	1,071	2,390,492	16,047,693	8,516	488,329	688,256	1,176,585	1.28	1.25	$ 0.10
Anaheim	10,031	30,893,997	301,491,228	10,031	30,893,997	301,491,228	185,198	3,245,580	-	3,245,580	13.74	13.35	$ 0.02
Azusa	2,533	4,367,915	37,749,300	1,856	3,736,832	32,022,316	19,137	560,556	160,778	721,334	5.65	3.50	$ 0.03
Banning	4,222	230,597	2,888,008	4,011	219,067	2,743,608	1,628	85,777	76,412	162,189	2.00	2.00	$ 0.08
Biggs	1	10,346	206,920	1	8,277	165,536	86	1,913	2,961	4,874	2.96	1.63	$ 0.05
Burbank	3,044	14,000,539	129,783,711	2,954	13,740,198	126,715,231	77,649	3,226,792	1,043,243	4,270,035	4.87	2.64	$ 0.04
Colton	1,134	8,160,247	80,541,187	1,126	8,134,315	80,219,411	45,479	1,031,574	197,829	1,229,403	6.93	2.28	$ 0.02
Corona	-	67,170	724,070	-	22,099	228,291	136	126,710	-	126,710	0.22	1.40	$ 0.71
Glendale	4,596	17,553,245	68,828,853	4,567	17,380,124	67,425,917	40,370	1,404,797	126,188	1,530,985	5.53	2.90	$ 0.03
Gridley	24	135,689	1,334,520	19	98,321	913,456	504	41,963	49,040	91,003	1.33	1.04	$ 0.13
Healdsburg	53	560,209	8,280,962	42	459,017	6,813,166	3,743	221,189	87,669	308,858	2.46	1.46	$ 0.06
Imperial ID	11,542	14,655,272	195,355,699	9,541	11,993,905	160,441,364	96,804	4,283,296	1,073,197	5,356,493	4.02	1.50	$ 0.05
LADWP	39,033	296,379,450	4,807,602,659	39,033	296,379,450	4,807,602,659	2,754,080	36,407,970	42,163,768	78,571,738	6.50	1.52	$ 0.02
Lassen	73	318,171	2,993,583	56	264,490	2,432,459	1,347	173,381	52,160	225,541	1.17	1.26	$ 0.12
Lodi	268	687,619	10,557,848	179	508,990	7,667,924	4,229	216,496	89,790	306,286	2.82	1.33	$ 0.06
Lompoc	11	100,305	1,045,377	8	71,118	750,993	409	20,124	50,000	70,124	1.12	0.90	$ 0.12
Merced	1	199,415	1,942,935	0	156,130	1,517,510	824	22,408	172,920	195,328	0.84	0.44	$ 0.16
Modesto	2,605	17,982,146	259,565,972	2,053	14,402,274	207,961,661	112,406	1,856,759	1,798,613	3,655,372	6.14	2.27	$ 0.02
Moreno Valley	228	1,164,038	7,656,445	267	1,156,619	7,554,722	4,676	202,361	13,000	215,361	5.02	2.85	$ 0.03
Needles	8	17,050	189,236	6	13,640	151,389	96	166,384	-	166,384	0.15	0.77	$ 1.54
Oakland	-	-	-	-	-	-	-	-	-	-	-	-	$ -
Palo Alto	790	7,192,341	72,418,812	635	6,063,494	58,167,025	-	861,820	1,506,172	2,367,993	1.79	1.16	$ 0.05
Pasadena	1,857	17,520,619	129,974,319	1,836	17,441,681	129,125,045	77,010	2,407,251	377,851	2,785,102	5.86	1.57	$ 0.03
Pittsburg	249	157,526	1,888,037	199	126,021	1,510,430	837	12,285	5,638	17,923	9.88	1.92	$ 0.02
Plumas-Sierra	14	304,771	5,536,385	0	79,814	1,420,394	788	25,532	36,676	62,208	2.52	1.14	$ 0.06
Rancho Cucamonga	49	203,589	2,942,430	49	203,589	2,942,430	1,724	15,102	32,000	47,102	7.47	11.00	$ 0.02
Redding	1,341	2,946,371	39,672,566	1,031	2,409,842	32,391,063	18,005	2,375,256	360,730	2,735,986	1.37	1.77	$ 0.10
Riverside	2,527	23,580,732	311,107,427	2,066	20,871,842	262,264,353	159,235	3,689,162	-	3,689,162	10.25	2.42	$ 0.02
Roseville	13,654	8,519,514	83,950,759	13,654	8,517,188	83,922,498	-	1,632,827	845,285	2,478,112	1.45	1.02	$ 0.04
SMUD	26,690	179,850,000	1,314,134,332	25,230	160,076,390	1,168,784,852	516,640	22,893,865	13,767,020	36,660,884	2.39	1.09	$ 0.03
San Francisco PUC	726	1,963,490	30,754,213	594	1,870,588	28,896,170	15,964	3,452,395	247,696	3,700,091	0.93	0.81	$ 0.18
Shasta Lake	68	526,192	6,680,756	46	408,955	5,130,225	2,831	217,934	64,093	282,027	2.14	0.96	$ 0.07
Silicon Valley	1,309	13,780,119	175,446,847	1,102	12,063,870	157,080,994	88,604	2,541,080	1,854,794	4,395,873	4.65	1.73	$ 0.04
Trinity PUD	-	113,448	1,134,480	-	68,069	680,688	364	89,250	-	89,250	0.71	0.74	$ 0.17
Truckee Donner	148	1,406,860	14,243,260	106	995,452	10,268,244	5,351	372,362	416,292	788,654	1.41	1.41	$ 0.10
Turlock ID	588	6,096,891	50,550,550	461	5,417,078	40,452,860	22,431	373,964	360,086	734,051	6.31	2.07	$ 0.03
Ukiah	79	300,992	5,972,986	66	235,926	4,723,118	2,638	88,508	44,379	132,887	4.19	2.53	$ 0.04
Vernon	1,112	7,042,115	22,209,571	911	5,823,574	17,688,756	10,500	205,107	94,400	299,507	7.21	5.54	$ 0.02
Victorville	-	-	-	-	-	-	-	-	-	-	-	-	$ -
Summary	**132,500**	**681,943,390**	**8,211,595,676**	**124,807**	**644,702,728**	**7,836,315,676**	**4,280,240**	**$95,038,059**	**$67,858,934**	**$162,896,993**	**5.98**	**2.02**	**$ 0.027**

Note: Imperial ID, Merced, Modesto, Plumas-Sierra, SMUD, Turlock ID, and Truckee Donner all operate on a calendar year basis. As such, data actually for CY 2015.

Figure 8. Summary of Energy Savings by Program Sector, FY 14/15

PROGRAM SECTOR SUMMARY		Resource Savings Summary									Cost Summary		
Program Sector (Used in CEC Report)	Category	Units Installed	Gross Coincident Peak Savings (kW)	Gross Annual Energy Savings (kWh)	Gross Lifecycle Energy Savings (kWh)	Net Coincident Peak Savings (kW)	Net Annual Energy Savings (kWh)	Net Lifecycle Energy Savings (kWh)	Net Lifecycle Gas Savings (MMBtu)	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)
Appliances	Res Clothes Washers	3,684	217	504,544	6,170,271	183	284,587	3,651,757	2,896	1,783	309,277	65,810	375,087
HVAC	Res Cooling	177,365	16,636	15,913,664	242,898,549	14,777	12,349,981	181,654,773		108,704	7,900,934	2,762,328	10,663,262
Appliances	Res Dishwashers	1,813	63	70,362	727,796	54	47,141	490,532		273	121,850	5,526	127,376
Consumer Electronics	Res Electronics	3,883	227	769,164	7,068,952	204	685,026	6,338,074		2,848	142,993	124,778	267,771
HVAC	Res Heating	40		3,023	29,059		2,395	22,890			200	1,028	1,228
Lighting	Res Lighting	1,749,230	13,325	71,644,478	649,143,790	12,022	64,697,309	587,657,702	14,018	254,348	8,987,258	2,619,407	11,606,665
Pool Pump	Res Pool Pump	4,636	701	5,188,989	57,616,993	634	4,710,921	52,819,511		24,892	1,479,764	1,470,992	2,950,756
Refrigeration	Res Refrigeration	18,595	3,441	21,980,989	178,806,116	3,336	18,889,149	163,361,293		92,390	8,390,344	2,421,063	10,811,407
HVAC	Res Shell	1,241,106	2,917	12,675,922	349,269,443	2,240	11,794,538	333,194,716	2,838	191,863	3,777,226	1,595,322	5,372,548
Water Heating	Res Water Heating	822	32	448,502	8,006,715	27	377,102	6,947,508		3,020	317,501	75,755	393,256
Comprehensive	Res Comprehensive	174,705	15,275	53,240,229	280,453,210	15,230	52,218,876	274,055,670	6,234	146,492	16,319,392	2,907,093	19,226,485
Process	Non-Res Cooking	2	1	6,293	88,974	1	5,570	80,300		7	3,000	543	3,543
HVAC	Non-Res Cooling	7,894,298	16,123	45,959,315	565,272,289	15,927	44,103,707	542,079,359		313,011	8,567,276	3,206,323	11,773,599
HVAC	Non-Res Heating	1	294	1,233,123	13,564,353	294	1,233,123	13,564,353		8,239	61,594		61,594
Lighting	Non-Res Lighting	13,845,684	32,983	198,115,222	2,064,235,367	31,010	187,281,254	1,975,843,157		1,101,561	24,434,984	34,662,854	59,097,838
Process	Non-Res Motors	36,049,268	6,591	49,195,358	526,872,380	6,432	48,356,127	514,283,913		285,022	3,861,152	2,949,442	6,810,595
Process	Non-Res Pumps	5	69	6,344,823	84,675,646	69	6,344,823	84,665,236		47,186	182,651	208,008	390,659
Refrigeration	Non-Res Refrigeration	626,939	616	9,415,934	98,100,131	595	8,465,142	87,712,712		42,102	1,851,452	1,219,633	3,071,085
HVAC	Non-Res Shell	2,537,109	3,954	14,803,575	90,519,313	3,159	13,477,641	80,140,351		48,515	954,354	419,697	1,374,052
Process	Non-Res Process	59	15,098	140,941,177	2,673,017,433	14,871	138,076,765	2,635,332,873		1,455,224	2,402,027	7,846,762	10,248,790
Comprehensive	Non-Res Comprehensive	3,438,765	3,288	28,797,554	305,530,114	3,093	26,610,400	282,890,215	27,607	146,941	4,857,618	3,296,571	8,154,189
Other	Other	39	650	4,691,151	9,528,782	650	4,691,151	9,528,782		5,820	115,210		115,210
SubTotal		67,768,047	132,500	681,943,390	8,211,595,676	124,807	644,702,728	7,836,315,676	53,594	4,280,240	$ 95,038,059	$ 67,858,934	$162,896,993
T&D	T&D	2,292	230	1,141,301	23,071,643	230	1,141,301	23,071,643		6,289	$ 0	$ 111,342	$ 111,342
Total		67,770,339	132,730	683,084,691	8,234,667,320	125,037	645,844,029	7,859,387,320	53,594	4,286,529	$ 95,038,059	67,970,277	163,008,335

EE Program Portfolio	TRC Test	**2.02**
	PAC Test	**5.98**

Figure 9. Summary of POU Programs, 2006-2015*

Year	Peak kW Savings	Annual MWh Savings	Lifecycle MWh Savings	Total Utility Expenditures ($)
FY05/06	52,552	169,303	2,249,214	$ 54,412,728
FY06/07	56,772	254,332	3,062,361	$ 63,151,647
FY07/08	82,730	401,919	4,473,801	$ 103,907,266
FY08/09	117,435	644,260	6,749,912	$ 146,093,107
FY09/10	93,712	522,929	5,586,299	$ 123,433,250
FY10/11	81,121	459,459	4,604,364	$ 132,372,795
FY11/12	82,561	439,710	4,638,521	$ 126,936,631
FY12/13	89,305	521,478	5,722,100	$ 134,475,230
FY13/14	110,437	625,187	6,413,468	$ 169,901,735
FY14/15	132,500	681,943	8,211,596	$ 162,896,993
TOTAL	**846,572**	**4,551,217**	**49,462,422**	**$ 1,217,581,382**

*For FY05/06 to FY12/13, Peak kW Savings, Annual MWh Savings, and Lifecycle MWh Savings were reported as net numbers; beginning in FY13/14, these values are in Gross terms. See Figures 6 & 7 for net values as well.

Figure 10. Total Program Expenditures, FY 2006-2015

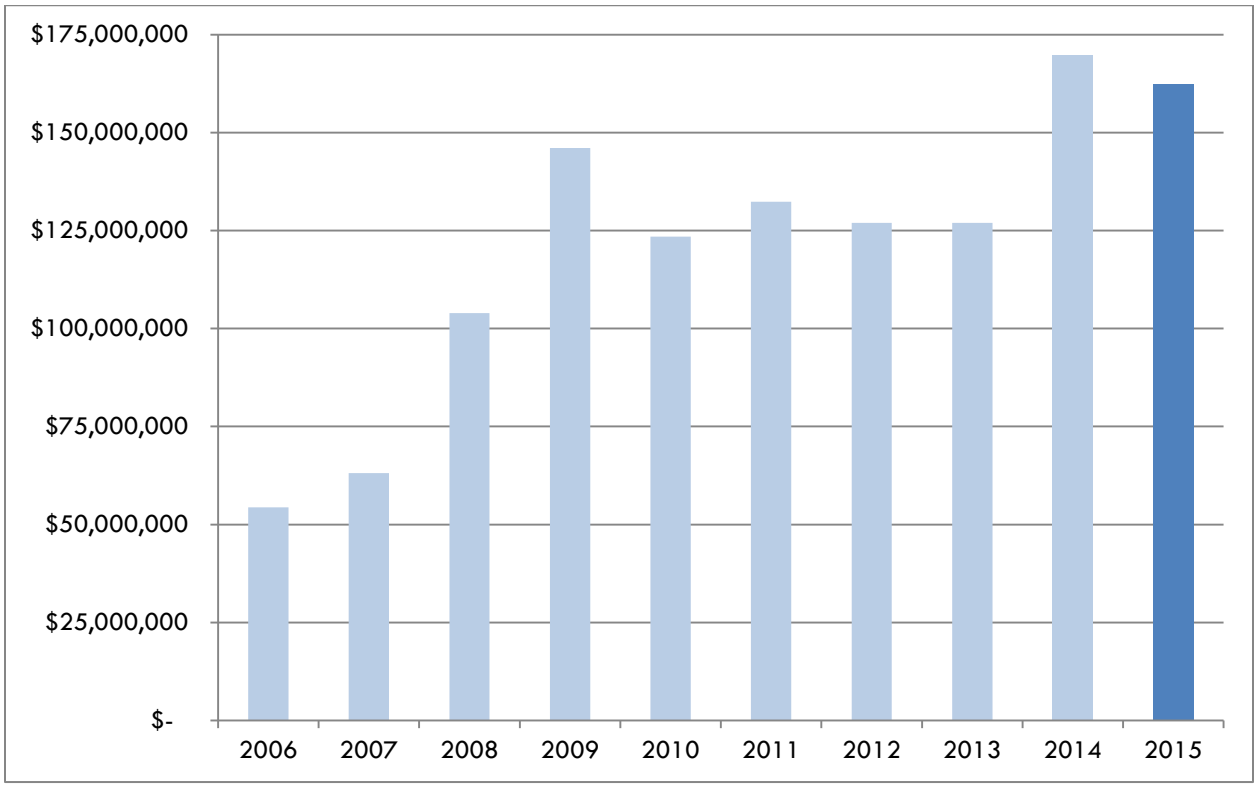

Figure 11. 15 Utilities With The Highest Gross Annual Savings (kWh), FY 2015

Utility	Gross Annual kWh Savings	Share of Total Savings (%)	Cumulative Share of Total Savings (%)
LADWP	296,379,450	43.5%	43.5%
SMUD	179,850,000	26.4%	69.9%
Anaheim	30,893,997	4.5%	74.4%
Riverside	23,580,732	3.5%	77.9%
Modesto	17,982,146	2.6%	80.5%
Glendale	17,553,245	2.6%	83.1%
Pasadena	17,520,619	2.6%	85.7%
Imperial ID	14,655,272	2.2%	87.8%
Burbank	14,000,539	2.1%	89.9%
Silicon Valley	13,780,119	2.0%	91.9%
Roseville	8,519,514	1.3%	93.2%
Colton	8,160,247	1.2%	94.3%
Palo Alto	7,192,341	1.1%	95.4%
Vernon	7,042,115	1.0%	96.4%
Turlock ID	6,096,891	0.9%	97.3%

Figure 12. LADWP & SMUD Compared to All Other POUs, FY 2015

Utility	Gross Peak kW Savings	Gross Annual kWh Savings	Gross Lifecyle kWh Savings	Total Utility Cost ($)
LADWP	39,033	296,379,450	4,807,602,659	$ 78,571,738
SMUD	26,690	179,850,000	1,314,134,332	$ 36,660,884
All Other POUs	66,777	205,713,940	2,010,708,145	$ 47,466,542
All Other POUs Share of Total (%)	50.4%	30.2%	24.7%	29.2%

Understanding Public Power Energy Efficiency Funding Sources

Section 9505(a)(3) of the Public Utilities Code requires POUs to include "the sources of funding for its investment in energy efficiency and demand reduction program investments." To that end, unless otherwise noted, program funding for energy efficiency programs within the public power community comes from the public goods charge that is collected from each utility customer pursuant to Section 385 of the Public Utilities Code.

The public goods charge is designated not only for energy efficiency, but also for renewable investment, electricity-related research and development, and low income assistance. When the Legislature authorized the imposition of the public goods charge beginning in 1998, local governing boards were afforded full discretion regarding how these funds would be allocated. Over the years, certain restrictions have been imposed on this discretion, limiting how future dollars can be allocated. As an example, under the California Solar Initiative, public utilities are precluded from reducing their expenditures on energy efficiency or low income assistance to fund its solar programs. That said, local governing boards allocate the majority of their public benefits expenditures to energy efficiency programs.

In some instances, local governing boards allocate dollars above and beyond public benefits expenditures, or even increase the public benefits surcharge to a level above the minimum 2.85% of sales requirement. Additional dollars as a practical matter come from the general fund of each jurisdiction, but could, from an energy policy context, be considered a means to defer procurement investment, to put it in context that is consistent with Section 9505(a)(3).

Critical to the ultimate success of public power energy efficiency programs is the ability to optimize the use of public dollars that are dedicated to energy efficiency activities. Putting aside the growing costs of measurement and verification, the majority of expenditures represent direct incentives to the customer and direct installation costs. By keeping overhead costs low, POUs are able to maximize the flow of money into their respective communities, which fosters economic development and customer investment into existing building infrastructures. In turn, these investments help to retain local jobs as well as promote local job growth.

The cost per net kWh saved over the lifetime of the energy efficiency measures is estimated at 2.7 cents per kWh. It is clear that California's POUs have established a high benchmark for efficient and effective delivery of energy efficiency programs.

6. EVALUATION, MEASUREMENT, AND VERIFICATION

Section 9505(d) of the Public Utilities Code requires that each local publicly owned electric utility shall make available to its customers and to the CEC the results of any independent evaluation that measures and verifies the energy efficiency savings and the reduction in energy demand achieved by its energy efficiency. Public power has strategically responded to this directive in a manner that confirms the accuracy of reported savings while optimizing the exchange of program information across the entire range of public power utilities, large and small.

The EM&V process used to provide utility program managers with feedback relies generally on the approaches articulated in the National Action Plan for Energy Efficiency, adopted CPUC protocols, and the innovation and expertise of firms experienced in program evaluation. To further enhance the value of the information obtained from these reports, the public power community has been working closely with CEC staff to develop a consistent set of evaluation guidelines for third-party consultants that are retained to evaluate utility programs. Over the past few years, the CEC has conducted several workshops regarding the EM&V process and has created a working version of evaluation guidelines, and these insights are already adding value to the analyses being undertaken across the public power community. CMUA, SCPPA and NCPA continue their active collaboration in this regard, sharing best practices and coordinating the distribution of program evaluation information throughout the public power community.

EM&V reports are intended to help utilities to understand the effectiveness of specific program areas with the purpose of enhancing program offerings in the future. Many of the EM&V studies completed to date focused on measures with high savings and measures that exhibit the greatest levels of uncertainty. Key findings from the reports submitted by POUs continue to confirm high realization rates for utility-reported energy savings, corroborating that public power's energy efficiency reporting provides a reliable source of data to help state policymakers gauge the success of the state's overall energy efficiency efforts.

The economic slowdown has had an impact on program evaluation and savings realization rates. In some cases, businesses participating in energy efficiency programs do not survive the economic downturn, even though the efficiency measures they paid for were installed, but ultimately are not being utilized as intended. In essence, unanticipated vacancies can negatively impact realization rates. In addition to the economic impacts, the continuing debate surrounding the use of net-versus-gross savings, especially when empirical data is not readily available, has made it difficult for evaluators to conduct a reliable net-to-gross analysis. Such debate is not exclusively focused on public power. The IOUs have effectively abandoned the use of net savings, something the public power community will consider going forward.

At the time this report was published, the public power community had made available more than 75 separate EM&V studies. Unless otherwise noted, each document is available at http://www.ncpa.com/current-issues/energy-efficiency-reports.html. A number of utilities are currently in the process of completing EM&V studies for FY2014-2015 programs. These and other subsequent reports will be posted to the above URL as they become available. POU-specific information regarding EM&V activities can also be found in the utility narratives contained in Appendix A.

7. Conclusions & Policy Considerations

7.1 Conclusions

CMUA, NCPA, and SCPPA appreciate the opportunity to provide this report on the results of the energy efficiency programs administered by public power in California during fiscal year 2014/2015. This section highlights the continued commitment of the POUs to making significant investments in energy efficiency on behalf of the customers and communities they serve. In the following section, public power offers policy considerations regarding future energy efficiency programs in furtherance of the state's interrelated energy, environmental, and economic goals.

FY14/15 Energy Efficiency Program Results

Regarding POU programs provided in FY14/15, the principal findings of this analysis are as follows:

- Sustained Investment: POUs spent over $162 million on energy efficiency programs. This represents public power's eighth consecutive year exceeding $100 million threshold and second only to last year as the highest single-year expenditure.

- Record-Setting Savings: POUs set new annual records for Gross Peak Savings (132.5 MW), Gross Annual Energy Savings (681.9 GWh), and Gross Lifecycle Savings (8,211.6 GWh). These totals represent significant gains over any prior year's results.

- $1.2 Billion Success: Since 2006, POUs have invested over $1.2 billion in energy efficiency programs, reduced peak demand by more than 846 megawatts, and achieved more than 4.5 million MWh in savings.

- Cost-Effectiveness: Applying the Total Resource Cost (TRC) societal test, the aggregated TRC for public power is 2.02 in FY14/15. The Program Administrator Cost (PAC) test also yielded a positive aggregate score of 5.98 for all POU programs.

- Most Savings: Lighting continues to be major source of savings for public power energy efficiency programs with residential and non-residential program accounting for 41.2% of the total gross annual savings. However, this is a lower share of the savings than in previous years.

- Efficacy of Programs: The cost per net kWh saved over the lifetime of all measures is $0.027/kWh for all of public power.

7.2 Policy Considerations

The vast experience of California POUs gained from years of administering energy efficiency programs can be captured in a single, foundational principle:

Customers are ultimately responsible for achieving savings from energy efficiency. To fully realize potential energy savings, policies and programs must aim to remove barriers and encourage voluntary action by customers to reduce energy usage.

This principle is important to keep in mind as 2015 saw a flurry of policymaker activity calling for an increasing reliance on energy efficiency as a key strategy to reducing greenhouse gas emissions:

- In January, Governor Brown announced that California will double the efficiency savings from existing buildings by 2030 as part of California's response to climate change.
- In April, Governor Brown issued Executive Order B-30-15, which establishes a mid-term GHG reduction target for California of 40% below 1990 levels by 2030 and reiterates the Governor's goal to double the efficiency savings from existing buildings as key to achieving this 2030 GHG emission reduction target.
- SB 350 (De Leon, 2015) was signed into law and codifies the Governor's goal to double the efficiency savings from existing buildings by 2030 and directs the CEC to develop annual targets that would achieve this goal "to extent doing so is cost-effective, feasible, and will not adversely impact public health and safety."
- AB 802 (Williams, 2015) was also enacted and contains two energy efficiency provisions:
    - Direction to CPUC to authorize IOUs to provide rebates to customers for energy savings from projects that bring a building up to code; currently, IOUs are largely limited to providing customers incentives for energy savings above current code requirements.
    - Replacement of the AB 1103 time-of-transaction building energy use disclosure program with a broader requirement for utilities to provide energy usage data for buildings to the building owners upon request, and direction to the CEC to establish a building energy use benchmarking and public disclosure program.
- In September, the California Air Resources Board released the Clean Power Plan Compliance Discussion Paper, which includes energy efficiency programs in the state's effort to satisfy GHG emission requirements of the U.S. EPA regulation.
- During the October 1st Joint Agency Workshop for the 2030 Target Scoping Plan, five focus areas for achieving the projected GHG reductions were identified, including energy efficiency.

The policy developments in 2015 emphasizing energy efficiency as a core strategy for reducing greenhouse gas emissions continues the 40-year discussion regarding the role of energy efficiency:

- In 1974, the Warren-Alquist Act was passed touting energy efficiency and conservation as a means to combat the rapid rate of growth in demand for electric energy.

- In 1990, born out of concerns about the cost to society – including cost to the environment – from the provision of reliable electricity and natural gas services, the Legislature declared that utilities should "seek and exploit all practicable and cost-effective conservation and improvements in the efficiency of energy use and distribution."[2]

- In 2005, as a response to the volatility in price and reliability of wholesale energy markets during the Energy Crisis, California enacted SB 1037 (Kehoe) to codify the "loading order" proposed in the Energy Action Plan, which directs utilities, when procuring energy, to first acquire all available energy efficiency and demand reduction resources that are cost effective, reliable, and feasible.[3]

Regardless of the motivation behind the various energy efficiency initiatives, the axiom that customers drive energy efficiency remains as true today as it was 40 years ago. Whether the goal is stemming load growth, mitigating cost exposure and volatility, improving the reliability of our electricity supply, and/or avoiding adverse environmental impacts, energy efficiency programs are only successful when customers are willing and able participants.

With expectations raised about the potential of energy efficiency to deliver energy, environmental, and economic outcomes, POUs respectfully offer the following observations, based on our collective experience administering energy efficiency programs, which are intended to guide policy discussions going forward.

Figure 13. Policy Considerations

- **Avoided energy costs are often NOT the motivating factor behind a residential customer's decision to invest in energy efficiency.**
- **Many customers will NOT pursue energy efficiency retrofits if the process to complete the retrofits is onerous and burdensome.**
- **Title 24 updates should focus primarily on new construction.**
- **SB 350 directs the CEC to establish statewide annual targets to meet the 2030 goal, not utility-specific mandates.**
- **Applying Title 24 to existing buildings and moving towards ZNE buildings reduces the potential energy savings from POU programs.**
- **A number of regulations create barriers for customer EE projects while other policies create simplified project pathways for competing DER technologies.**
- **EE is going to increasingly have to compete with other DER technologies.**

[2] Section 25000.1 of the Public Resources Code

[3] Section 454.5 (b)(9)(C) of the Public Utilities Code for electrical corporations and Section 9615 of the PU Code for POUS

Customer Decisions: The Influence of Non-Energy Benefits and Non-Monetary Costs

A thorough understanding of the factors and motivations that influence customer decision-making is vital to the achievement of the state's energy efficiency goals. To this end, POUs go to great lengths to plan, develop, and implement energy efficiency programs that recognize the unique needs and motivations of the customers they serve. The relationship between POUs and their customers is critical to developing successful programs that garner participation and encourage energy efficiency investments.

In many cases, a residential customer's decision to make energy efficiency improvements is not primarily motivated by reducing their monthly utility bill or a specific attitude towards energy efficiency. Arthur Rosenfeld, former CEC Commissioner and renowned as the "godfather of energy efficiency", co-authored research (Mills & Rosenfeld, 1996) that framed customer motivations as follows:

> *"From a consumer perspective, it is often the non-energy benefits that motivate (or can be used to promote) decisions to adopt energy-efficient technologies… From the perspective of energy consumers, non-energy benefits can equal or even exceed the importance of the energy cost avoided, thus meriting greater consideration in private investment decisions, marketing strategies, design and evaluation of utility programs, and government policies designed to promote energy efficiency."*[4]

Twenty years later and the findings of the research are no less true. Understanding customer motivations for investing – and not investing – in energy efficiency is particularly critical to policies and programs targeting energy savings in existing buildings. While there remain significant energy saving opportunities in existing buildings, motivating customers to pursue improvements to realize those savings presents real challenges as energy benefits, and the attendant reduction in the monthly utility bill, is not the prime motivation for customers to pursue energy efficient technologies and building improvements.

Whereas non-energy benefits can motivate customers, non-monetary costs can dissuade customers from pursuing energy efficiency retrofits. An Energy Institute at Haas working paper[5] explored the impact of non-monetary costs on customer participation in a free weatherization program. The Weatherization Assistance Program that was studied provided participating households with an energy audit and a home retrofit that typically included some combination of insulation, window replacements, furnace replacement, and infiltration reduction. The average value of the efficiency retrofits provided to participating households in the study exceeded $5,000 per home.

The research found that the process of applying for weatherization programs is onerous and time intensive. Applicants must submit extensive paperwork documenting their eligibility. Despite being eligible for an average of $5,000 in improvements, the paper concluded that there is "striking evidence that individuals

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[4] Mills, E. and Rosenfeld, A. 1996. "Consumer Non-Energy Benefits as a Motivation for Making Energy-Efficiency Improvements." *Energy* (21)7-8: 707-720

[5] Fowlie, M., Greenstone, M., and Wolfram, C. 2015. "Are the Non-Monetary Costs of Energy Efficiency Investments Large? Understanding Low Take-up of a Free Energy Efficiency Program." *Energy Institute at Haas WP 256*

and households bypass opportunities to improve energy efficiency that require zero out-of-pocket expenditures and are widely believed to be privately beneficial." The researchers also noted that participation is only modestly increased by extraordinary education and outreach efforts. The rate at which households pursued a weatherization retrofit increased nominally from less than 1% to almost 6% when provided the additional education and outreach. On average, it cost an additional $1,000 per household in program administration for the education and outreach efforts.

While the working paper cited above focuses on a program for residential customers, recent trends in the California commercial lighting industry reflect a similar phenomenon – if the process to complete energy efficiency retrofits is onerous and burdensome, then many customers will simply not make the investment.

The 2013 Title 24 update established significant new requirements for non-residential lighting retrofit projects, which represents a departure from the norm in which updates focus on provisions for new – not existing – buildings. As evidenced by public comments submitted to the CEC, lighting retrofit projects have been stymied. For example, in its comments November 6, 2015 advocating support for changes to the adopted 2013 Title 24 Update's lighting alteration provisions, Ecology Action states:

> *"Title 24 2013's requirements for lighting retrofits are overly burdensome, and customers have responded to the new rules by simply not retrofitting old equipment. Instead they are maintaining existing inefficient equipment, stranding an enormous quantity of energy savings throughout California."*[6]

The CEC retrofit requirements adversely impacted customers, contractors, and utilities. By creating barriers for retrofits, customers were not reducing their bills, contractors lost work, and utilities were not realizing energy savings. As such, the practical impact of the 2013 Title 24 lighting alteration provisions is in direct conflict with state policies of 1) reducing customer bills, 2) spurring economic activity in the California clean energy industry, and 3) reducing greenhouse gas emissions from the electricity sector.

Public power saw a drop in savings from their non-residential lighting programs once the 2013 Title 24 updates went into effect in July 2014. Compared to last year, gross annual energy savings from non-residential lighting programs are down 13% (227.6 GWh in FY13/14 compared to 198.1 GWh in FY14/15). While many factors may be responsible for this dip, a number of utilities reported that the costs and requirements of complying with 2013 Title 24 update were cited by contractors and customers as a deterrent to pursuing energy efficiency retrofits.

- **Avoided energy costs are often NOT the motivating factor behind a residential customer's decision to invest in energy efficiency.**
- **Many customers will NOT pursue energy efficiency retrofits if the process to complete the retrofits is onerous and burdensome.**
- **Title 24 updates should focus primarily on new construction.**

[6] Available: http://www.energy.ca.gov/title24/2016standards/rulemaking/documents/15-day_language/comments/

SB 350: POU Potential Studies and Statewide Targets

Pursuant to Section 9505(b) of the Public Utilities Code, every four years POUs conduct energy efficiency potential studies to identify all achievable cost-effective energy efficiency savings and establish annual targets for energy efficiency savings and demand reduction for the next 10-year period. The current 10-year targets (see Appendix B) were adopted in 2013 and POUs are in the process of conducting updated potential studies for 2018-2027, which will be included in next year's version of this report.

Using the Navigant EERAM model, the current potential studies include three forecasts of energy savings:

- Technical Potential is the amount of energy savings that would be possible if the highest level of efficiency for all technically applicable opportunities to improve energy efficiency were taken.
- Economic Potential uses the results of the technical potential analysis to calculate the total energy efficiency potential available when limited to only cost-effective measures, as defined by the Total Resource Cost (TRC) test.
- Market Potential estimates the energy efficiency savings that could be expected in response to specific levels of incentives and assumptions about market influences and barriers, including the conclusions about non-energy benefits and non-monetary costs noted above. All components of market potential are a subset of economic potential. Similar to IOUs as determined by the CPUC, market potential was used to establish POU energy efficiency goals.

SB 350 did not establish new requirements for POUs when conducting the quadrennial potential studies. Instead the CEC is tasked with developing annual statewide targets based on doubling the potential energy savings from a variety of programs and sources, including POU potential studies, to the extent doing so is cost-effective, feasible, and will not adversely impact public health.[7] SB 350 did not eliminate the existing requirement for the CEC to develop a statewide estimate of all potentially achievable cost-effective electricity and natural gas efficiency savings and establish targets for statewide annual energy efficiency savings and demand reduction for the next 10-year period.[8] As such, the CEC is being asked to both establish aspirational energy efficiency goals per SB 350, as well continue to develop an estimate of energy efficiency potential for the purposes of informing the demand forecast.

In the *2015 Integrated Energy Policy Report (IEPR)*, the CEC interprets SB 350 as directing the CEC to establish a mandatory energy efficiency goal for each utility that is to be reached by 2030.[9] Public power strongly believes this is a mischaracterization of the statute. Per Section 25310(c), the CEC is directed to base the targets on the CEC's own estimate of additional achievable energy efficiency for 2015-2025, and POU potential studies. The direction provided in SB 350 is for the CEC to develop annual statewide targets – not utility-specific mandates – based on a range of programs, as noted in Section 25310(d) of the Public Resources Code. The CEC interpretation of SB 350, as expressed in the *2015 IEPR*, is unfounded.

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[7] Section 35310(c) of the Public Resources Code

[8] Section 25310(b) of the Public Resources Code

[9] *2015 Integrated Energy Policy Report*, p.31

The distinction between an "aspirational goal" and a demand forecast is important. Goals can help drive program design and push program administrators to develop innovative, new programs. However, utility resource planners need to rely on estimations of savings from energy efficiency that reflect actual market conditions and customer potential to pursue energy efficiency activities.

When establishing new annual targets for 2018-2027, POUs will rely on assumptions specific to their respective customer base, community economic conditions, climate zone, and service territory. In this way, the findings of the energy efficiency potential study can be integrated into broader utility resource planning efforts. As was the case in 2013, some POUs, at the discretion of their local governing boards, may elect to adopt targets that are "stretch goals" that exceed the identified market potential for their community, in which case the 10-year EE targets may reflect EE savings levels higher than what is incorporated into the utility's demand forecast and resource plan.

One of the major forces shaping the forthcoming POU potential studies is state activities related to Existing Buildings Energy Efficiency (EBEE) Action Plan and Zero Net Energy (ZNE) Buildings. Through the EBEE, the CEC has stated its intent to update Title 24 buildings standards to include requirements for existing buildings. In the best-case scenario, customers and building owners will make improvements to their buildings because Title 24 requires it. The practical impact of this is that utility incentives for the improvements will not be necessary as customers are required to make the improvements, thereby shifting potential future energy savings attributable from utility programs to Title 24.

However, as noted above, increasing project requirements for customers has been shown to discourage customers from pursuing energy-saving improvements. Furthermore, the additional permit requirements create resource issues for local planning departments. The CEC recommends solving the problem by increasing permit fees. While that would solve the resource issue for the planning department, it further escalates costs for customers thereby discouraging at least a portion of them from pursuing retrofits or pulling the permits to ensure the projects are completed correctly.

Whether or not applying building energy efficiency standards to existing buildings results in the anticipated energy savings through code compliance or further discourages customers from pursuing retrofits, the impact to utility programs is similar – energy savings potential is decreased. In a similar vein, the state's ambitious move towards ZNE buildings through more stringent Title 20 and Title 24 standards will also reduce the potential energy savings from utility programs, although the savings will be realized through codes and standards. It is this very interactive effect between various EE programs that prompted the statewide approach in SB 350 versus a more narrowly-focused utility-specific mandate.

- **SB 350 directs the CEC to establish statewide annual targets to meet the 2030 goal, not utility-specific mandates.**
- **Applying Title 24 to existing buildings and moving towards ZNE buildings reduces the potential energy savings from POU programs.**

Preferred Resources: Competing Distributed Energy Resources & the Loading Order

California policies over the last two decades have facilitated a transformation in the distributed energy resources (DER) marketplace. Customers have access to a range of technologies that can meet their energy needs and directly compete with energy efficiency. Consider for example, rooftop solar systems, thermal energy storage, and ENERGY STAR® HVAC systems can all individually help customers manage their air conditioning loads and/or the costs associated with that load, albeit it in very different manners:

- Rooftop solar supplants customer usage from the grid, avoiding more expensive rate tiers.
- Thermal energy storage shifts electricity usage to off-peak periods and reduces demand charges.
- ENERGY STAR® HVAC systems use less energy to provide AC services than the older units they are replacing – especially when coupled with smart thermostats.

Current state policy requires utilities to first and foremost pursue all cost-effective, reliable, and feasible energy efficiency; however, no such requirements are in place for customers. While not the only driver, for customers who do decide to make energy investments, these decisions are often based on economics and cash-flow. Faced with a choice between financing a larger rooftop solar system – potentially with no money down – and having to pursue energy efficiency retrofits that entail additional permits and longer project completion timelines, customers may opt for the simpler, quicker option of installing solar.

AB 327 (Perea, 2013) included provisions to facilitate a greater deployment of distributed energy resources (DERs) by requiring the electrical corporations to file distribution resources plan (DRP) proposals with the CPUC that "identify optimal locations for the deployment of distributed resources – distributed renewable generation resources, energy efficiency, energy storage, electric vehicles, and demand response technologies.[10] The CPUC proceeding regarding DRPs (R.14-08-013) covers a number of related issues as a separate CPUC proceeding (R.14-10-003) to create a consistent regulatory framework for the guidance, planning and evaluation of Integrated Distributed Energy Resources (IDER).

As noted in the IDER amended scoping memo[11] filed on February 26, 2016, the DRP rulemaking will, among other things, develop methodologies to determine how distributed energy resources can meet system needs as an alternative to traditional investments and produce maps that indicate where distributed energy resources should be sourced. One of most significant issues the amended scoping memo notes will be addressed in the IDER proceeding is the "continued development of technology-neutral cost-effectiveness methods and protocols." While these efforts are specific to electrical corporations subject to the jurisdiction of the CPUC, which does not include POUs, the impacts of the rulemaking decisions will reverberate across the entire California energy sector, including public power communities.

The significance of the IDER proceeding developing a technology neutral cost-effectiveness methodology is that it paves the way for future utility procurement of "preferred resources" similar to the Southern

[10] Section 769(a) of the Public Utilities Code

[11] Available: http://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M158/K886/158886810.PDF

California Edison Preferred Resources Pilot authorized by the CPUC in response to the premature closure of the San Onofre Nuclear Generating Station. Under a preferred resources solicitation, DERs compete to provide the utility with the needed services. The competitive DER marketplace proffered by preferred resources procurement is seemingly at odds with a Loading Order approach that values energy efficiency at a premium above all other resources. While creating technology-neutral valuation methods of DERs can clarify the costs and benefits for utility procurement purposes, customer preference will still play a critical role in determining which DER technologies succeed in different communities.

For example, energy efficiency improvements can reduce the number of solar panels a customer needs to install to serve their load. However, customers who install solar panels frequently do not pursue deeper EE improvements. This trend was identified in 2014 research conducted by staff at the Center for Sustainable Energy (CSE), which found that simple upgrades, such as lighting and Energy Star appliances, are most commonly installed among respondents. In contrast, duct/seal replacement, which could yield significant energy savings are only performed by a small fraction of solar adopters.[12] In the end, many customers who install solar are avoiding investments in cost-effective, feasible energy efficiency.

Many DER technologies support California's goals of reducing greenhouse gas emissions, promoting local job growth, and providing energy management control to customers. Likewise, the state has enacted policies, including the recently adopted and highly contested decision on full-retail Net Energy Metering, expedited siting for customer-sited solar arrays and electric vehicle supply equipment, tax rebates for electric vehicles, and energy storage procurement mandates, to remove barriers and encourage customer investments in these DERs in support of state climate change, economy, and energy goals.

In contrast, CPUC policies limit utility incentives for below-code and to-code energy savings and require extensive verification of energy savings from utility programs. The CEC seeks to impose additional permitting requirements for projects in existing buildings and allow builders to install solar panels as an alternative to energy efficiency requirements for high performance attics and insulation in new construction. To be clear, both agencies have provided extensive justification of their respective positions. The point is even if the policies are appropriate, they still hinder customer investment in energy efficiency at the same time different policies – and rapidly innovating technology – are encouraging customers to invest in other DERs that are effectively competing with energy efficiency for limited customer dollars.

Achieving the Governor's goal for doubling the energy efficiency in existing buildings and continuing to abide by the Loading Order may require the CEC and CPUC to amend their policies so as to further remove barriers to customer investment in the energy efficiency.

- **A number of regulations create barriers for customer EE projects while other policies create simplified project pathways for competing DER technologies.**
- **EE is going to increasingly have to compete with other DER technologies.**

[12] Langheim, R., Arreola, G., and Reese, C. August 2014. *Energy Efficiency Motivations and Actions of California Solar Homeowners*. Presented at ACEEE Summer Study on Energy Efficiency in Buildings, Pacific Grove, CA, August 17-22, 2014.

APPENDIX A: DESCRIPTIONS OF UTILITY PROGRAMS

This appendix consists of detailed narratives of each publicly owned utility's energy efficiency programs, as well more general descriptions of the utilities. Utility-specific summaries of their energy programs for FY14/15, compiled using the E3 Reporting Tool, can be found at the end of each utility's narrative. The table below summarizes the energy savings and programs investments made by all POUs in FY14/15.

All POUs – Summary of Energy Efficiency Programs, FY14/15

POU SUMMARY					Cost Summary			Cost Test Ratios		
Utility	Net Coincident Peak Savings (kW)	Net Annual Energy Savings (kWh)	Net Lifecycle Energy Savings (kWh)	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)	PAC	TRC	Utility ($/kWh)
Alameda	1,071	2,390,492	16,047,693	8,516	488,329	688,256	1,176,585	1.28	1.25	$ 0.10
Anaheim	10,031	30,893,997	301,491,228	185,198	3,245,580	-	3,245,580	13.74	13.35	$ 0.02
Azusa	1,856	3,736,832	32,022,316	19,137	560,556	160,778	721,334	5.65	3.50	$ 0.03
Banning	4,011	219,067	2,743,608	1,628	85,777	76,412	162,189	2.00	2.00	$ 0.08
Biggs	1	8,277	165,536	86	1,913	2,961	4,874	2.96	1.63	$ 0.05
Burbank	2,954	13,740,198	126,715,231	77,649	3,226,792	1,043,243	4,270,035	4.87	2.64	$ 0.04
Colton	1,126	8,134,315	80,219,411	45,479	1,031,574	197,829	1,229,403	6.93	2.28	$ 0.02
Corona	-	22,099	228,291	136	126,710	-	126,710	0.22	1.40	$ 0.71
Glendale	4,567	17,380,124	67,425,917	40,370	1,404,797	126,188	1,530,985	5.53	2.90	$ 0.03
Gridley	19	98,321	913,456	504	41,963	49,040	91,003	1.33	1.04	$ 0.13
Healdsburg	42	459,017	6,813,166	3,743	221,189	87,669	308,858	2.46	1.46	$ 0.06
Imperial ID	9,541	11,993,905	160,441,364	96,804	4,283,296	1,073,197	5,356,493	4.02	1.50	$ 0.05
LADWP	39,033	296,379,450	4,807,602,659	2,754,080	36,407,970	42,163,768	78,571,738	6.50	1.52	$ 0.02
Lassen	56	264,490	2,432,459	1,347	173,381	52,160	225,541	1.17	1.26	$ 0.12
Lodi	179	508,990	7,667,924	4,229	216,496	89,790	306,286	2.82	1.33	$ 0.06
Lompoc	8	71,118	750,993	409	20,124	50,000	70,124	1.12	0.90	$ 0.12
Merced	0	156,130	1,517,510	824	22,408	172,920	195,328	0.84	0.44	$ 0.16
Modesto	2,053	14,402,274	207,961,661	112,406	1,856,759	1,798,613	3,655,372	6.14	2.27	$ 0.02
Moreno Valley	267	1,156,619	7,554,722	4,676	202,361	13,000	215,361	5.02	2.85	$ 0.03
Needles	6	13,640	151,389	96	166,384	-	166,384	0.15	0.77	$ 1.54
Oakland	-	-	-	-	-	-	-	-	-	$ -
Palo Alto	635	6,063,494	58,167,025	-	861,820	1,506,172	2,367,993	1.79	1.16	$ 0.05
Pasadena	1,836	17,441,681	129,125,045	77,010	2,407,251	377,851	2,785,102	5.86	1.57	$ 0.03
Pittsburg	199	126,021	1,510,430	837	12,285	5,638	17,923	9.88	1.92	$ 0.02
Plumas-Sierra	0	79,814	1,420,394	788	25,532	36,676	62,208	2.52	1.14	$ 0.06
Rancho Cucamonga	49	203,589	2,942,430	1,724	15,102	32,000	47,102	7.47	11.00	$ 0.02
Redding	1,031	2,409,842	32,391,063	18,005	2,375,256	360,730	2,735,986	1.37	1.77	$ 0.10
Riverside	2,066	20,871,842	262,264,353	159,235	3,689,162	-	3,689,162	10.25	2.42	$ 0.02
Roseville	13,654	8,517,188	83,922,498	-	1,632,827	845,285	2,478,112	1.45	1.02	$ 0.04
SMUD	25,230	160,076,390	1,168,784,852	516,640	22,893,865	13,767,020	36,660,884	2.39	1.09	$ 0.03
San Francisco PUC	594	1,870,588	28,896,170	15,964	3,452,395	247,696	3,700,091	0.93	0.81	$ 0.18
Shasta Lake	46	408,955	5,130,225	2,831	217,934	64,093	282,027	2.14	0.96	$ 0.07
Silicon Valley	1,102	12,063,870	157,080,994	88,604	2,541,080	1,854,794	4,395,873	4.65	1.73	$ 0.04
Trinity PUD	-	68,069	680,688	364	89,250	-	89,250	0.71	0.74	$ 0.17
Truckee Donner	106	995,452	10,268,244	5,351	372,362	416,292	788,654	1.41	1.41	$ 0.10
Turlock ID	461	5,417,078	40,452,860	22,431	373,964	360,086	734,051	6.31	2.07	$ 0.03
Ukiah	66	235,926	4,723,118	2,638	88,508	44,379	132,887	4.19	2.53	$ 0.04
Vernon	911	5,823,574	17,688,756	10,500	205,107	94,400	299,507	7.21	5.54	$ 0.02
Victorville	-	-	-	-	-	-	-	-	-	$ -
Summary	**124,807**	**644,702,728**	**7,836,315,676**	**4,280,240**	**$95,038,059**	**$67,858,934**	**$162,896,993**	**5.98**	**2.02**	**$ 0.027**

Note: Imperial ID, Merced, Modesto, Plumas-Sierra, SMUD, Turlock ID, and Truckee Donner all operate on a calendar year basis. As such, data actually for CY 2015.

ALAMEDA MUNICIPAL POWER

Alameda Municipal Power (AMP) at a Glance

- Year established – 1887, oldest POU in California
- Climate Zone – 3A
- Number of retail customer connections – 34,613 (88% residential, 12% commercial)
- Percent of retail sales by customer class – residential – 37%, commercial – 63%
- FY 2015 electric sales revenue……$50,586,481.44
- Total budgeted amount for energy efficiency programs……..$1,989,050.00
- Total actual energy efficiency expenditures……...$1,176,585.00
  Notes:
  1. AMP has greatly exceeded required Public Benefits expenditures.
  2. A large commercial direct install lighting program budgeted at $600,000 started mid-2015 and continues through FY 2016. Due to program ramp-up time, most of the program expenditures were in FY 2016.
  3. Residential LED programs required ramp-up time in FY 2015.

AMP Overview

- Due to Alameda's maritime temperate climate and small amount of industry, the peak demand for electricity is in the winter (December and January) in the early evening. AMP's electric load is relatively flat compared to most California utilities and there is no residential air-conditioning.
- More than 8 percent of AMP's load is maritime, this includes a Coast Guard Base and the Maritime Administration with nine ships home ported in Alameda.
- In FY 2015 AMP started installing advanced metering infrastructure (AMI). Advanced meters have been installed on all medium and large commercial customers as of November 2015. AMI customers have access to a portal with their energy use data, which includes 15-minute interval data, kW, kWh, kVA, power factor, and weather data. Complete build out for all AMP customers will be completed in 2017.
- AMP has committed to spending much of its cap and trade and renewable energy credit (REC) funds to reduce greenhouse gas emissions in our service area.
- AMP electric sales and the average residential energy use have been declining annually since 2011. This trend is similar to other utilities both in California and nationally. This downward trend is likely due to several factors.
  - Increase in customer energy efficiency
  - Increase is customer-owned distributed generation
  - Increase in energy efficiency in codes and standards, particularly CA Title 24,the CA Building Standards, and Title 20, the 2012 Appliance Efficiency Regulations
  - Consumer technology trends have decreased energy use also. For example, LED TVs, which use 130 watts, have largely replaced plasma TVs, which used 400 watts. Also lap

top computers, which use 5 to 10 watts, have largely replaced desktop computers, which used 32 watts or more.

- Increase in the efficiency requirements for the Energy Star label

AMP Electric Sales and Average Residential Electric Use

Year	Actual Electric Sales (MWh/yr.)	Residential Average Annual Electric Use (kWh/yr.)
2011	382,634	4,651
2012	373,787	4,555
2013	363,444	4,434
2014	353,913	4,265
2015	342,203	4,053

Major Program Changes

- Residential LED

  LEDs have advanced from a new concept to a more mainstream lighting option for residents. Even within this fiscal year, retail prices have decreased from well over $10for an 800 lumen general purpose A-lamp, to $5. LEDs are now available to replace nearly all specialty lighting, from globes to 3-way switches.

  Since not all Alameda residents have made the switch from incandescent to CFL, AMP has encouraged residents to try LEDs. AMP expanded LED programs to include an initial promotion, where LEDs were mailed to all residents, a free LED option for customers that choose to have an in-home energy audit, as well as a simplified LED rebate program.
- Commercial LED

  Likewise with commercial customer applications of LEDs, the variety, the cost, and the reliability has improved considerably recently. The majority of the energy efficiency retrofits in the "Commercial Lighting Direct Install Program" were LEDs. The most common LED retrofits were for exterior lighting and various spot lighting.
- Impacts of 2013 Title 24 Building Energy Efficiency Standards (T24)

  The 2013 T24, which went into effect in July 2014, apply to lighting retrofits in existing non-residential buildings. This has become a barrier to many customers and has decreased the scope of many retrofits and increased the cost of doing retrofits. Typically, 60 percent of AMP's energy efficiency portfolio is non-residential lighting retrofits. The impacts are:
  - Longer time and increased costs for lighting installers to do audits for projects that trigger the T24 code
  - The lighting controls that required by the 2013 T24 are costly and customer acceptance has been low of these controls.
  - Customers are not doing comprehensive retrofits and are opting for smaller projects that do not trigger code.

- In general, costs for projects that trigger code have doubled.

- REC funds for Energy Efficiency
  Revenue from the short-term sale on AMP's renewable energy credits (RECs) funded the largest energy efficiency programs for FY 2015. Those programs include:
  - Project 1: LED Streetlight Replacement – Cobra Head and Shoe Box (will be finished in FY 2016)
  - Project 2: Commercial Lighting Retrofit Rebate Program (will be finished in FY 2016)
  - Project 3: LED Light Bulbs for Existing Alameda Residential Customers

  Revenue from the RECs sale will be used for the benefit of utility ratepayers and to support AMP policies to reduce greenhouse gas emissions associated with ratepayer electric use.

Program Highlights

- LED mailing to residential customers
  AMP mailed two free LEDs to every residential service address in February – March 2015. Many customers called and emailed with their support for the program and gratitude for AMP's "gift." AMP expects to see a flattening in its load curve during peak winter evenings as a result of the 56,832 LEDs that were delivered, due to the huge potential savings – 850,642 kWh per year (gross savings). This program was funded by AMP REC funds.

- My Energy Program
  The goal of the My Energy Program is to encourage behavioral changes to improve energy efficiency by sending customers Home Energy Reports (HER) five times during the program year that compares their energy use to their neighbors and provide tips on how they can reduce their energy use. The residential customer base was split in half: one group receives five HERs in the mail each year (the test group), while the other half does not receive a HER in the mail (the control group).
  All residents have access to the My Energy web portal, an online tool that provides similar information to the mailed report, such as comparisons to similar sized homes in Alameda, energy efficiency tips, and goal-setting for reducing use. Nearly 300 Alameda residents set up accounts through the My Energy portal, which was visited over 600 times. Customers checked that they did, or would complete, 1,718 energy-saving tip actions.
  The net energy savings from this program as reported by the vendor are 1,369,139 kWh for FY 2015 and the lifetime of the savings is one year. This works out to 97 kWh/year per participant.

- Residential LED Rebate Programs
  The FY 2015 Residential LED Program started out as a customized residential LED program with a rebate rate of $0.20/kWh to encourage customers to try LEDs. Also the cost of LEDs was relatively high. In April 2015 the program was updated to a prescriptive rebate program. Participation increased from five applications a month to 200 applications in three months. Also LEDs were

given to customers who received on site audits. Collectively, nearly 3,000 LEDs were installed through these programs resulting in 46,948 kWh/yr. (net) in energy savings.

- Commercial Lighting Direct Install Program
  In FY 2015 AMP started the REC-funded Commercial Lighting Direct Install Program, administered by a third party vendor. The goals of the program are to remove customer barriers to lighting retrofits such as knowledge of lighting technologies, project management, quality of contractors and fair pricing, first costs, compliance with Title 24; and reach customers that have not participated in energy efficiency programs previously. More than 80% of the participants were small commercial customers who had never participated before and the estimated energy savings from this program are 1,629,371 kWh/year (gross savings). Starting in January 2016, AMP will expand this program to include all non-residential customers; and HVAC and refrigeration measures.

- LED Street Light Retrofit
  AMP started the retrofit of all City of Alameda cobra head and shoe box street lights with LEDs in June 2015. This REC-funded project will be completed in January 2016 (FY 2016) and will provide and estimated energy savings of 853,587 kWh/year (gross).

Program Descriptions

Residential Lighting

- CFL Light Exchange: This program allows customers to visit the AMP service center and exchange three incandescent lights for three CFLs.

- LED Programs: The AMP residential LED program started out as a customized program with a rebate rate of $0.20/kWh. The program was updated in April 2015, to a prescriptive rebate program. Through these programs AMP customers installed nearly 3,000 LEDs.
  Using REC funds, AMP mailed two LEDs to every residential service address in February and March of 2015, a total of 56,832 LEDs were delivered.

Residential Refrigeration

- Energy Star Refrigerator and Freezer Rebate & Recycle Program: This program provides a $100 rebate to customers who purchase an Energy Star refrigerator or freezer and recycle their old appliance with AMP's recycler. Part of the goal of the program is to educate customers about Energy Star and encourage the purchase of other Energy Star appliances and equipment. Because there is no residential air conditioning in Alameda, the refrigerator is usually one of the biggest energy users in an Alameda home.
- Second Refrigerator or Freezer Pick- Up Program: This program provides customers a rebate to get rid of their extra refrigerator or freezer and recycle it properly with our recycler.

Residential Other

- Monitor Lending Program: Borrow a Kill A Watt monitor to measure the energy use of appliances.
- Onsite Energy Audits: AMP provided residential audits at no cost to 52 customers. Customers are given the option of three free CFLs or one free LED.
- Online Appliance Calculator: Online appliance calculator on AMP's website.
- My Energy Program: As part of the My Energy program a home energy report is mailed to 50 percent of Alameda residential customers five times a year that includes a summary of the homes historical and recent energy use, energy efficiency tips, and a comparison of their energy use to their neighbors.

Non-Residential Cooling

- Commercial HVAC Retrofit Program: Prescriptive rebates for retrofitting existing buildings with energy-efficient HVAC equipment.

Non-Residential Lighting

- Commercial Lighting Retrofit Program: A program with rebates, both prescriptive and custom, for retrofitting lighting with energy efficient equipment.

Non-Residential Process

- Commercial Customized Rebate Program: A program with customized rebates based upon the kWh/year savings not covered by the lighting or HVAC program

Non-Residential New Construction

- New Construction Design Assistance: Grants of up to $10,000 for energy-efficient design work.
- New Construction Rebates: Whole building and systems rebates for energy-efficient new construction.

Non-Residential Other

- Commercial On-Site audits: Free energy audits for lighting, HVAC, refrigeration, process systems, etc.

EM&V

AMP does EM&V for each year, but completes the actual EM&V process every two years. This method is a more economical use of staff resources. The most recent EM&V was done for FY 2012 and 2013 by Energy & Resource Solutions. This is the link to that report - http://www.ncpa.com/images/stories/Energy Efficiency/emv_reports/AMP 2012 2013 MV report_ERS_Final.pdf . The typical budget for EM&V is $40,000 for two years. The next EM&V will be for FY 2014 and 2015, and the focus will be on residential energy efficiency programs, specifically the refrigerator and freezer program, LED promotion (mailing), and LED rebates.

Sources of Energy Savings

With a goal of getting the most accurate energy savings, AMP staff used a variety of sources for energy savings. Whenever possible actual existing and installed equipment data is used. AMP does pre and post installation inspections on all commercial sector rebate projects, and did pre and post inspections on one of

the four residential LED programs in 2015. For the other three residential lighting programs, the energy savings from the TRM 2014 were used. The energy savings figures for the residential refrigerator programs were from the TRM 2014. The energy savings from My Energy, AMP's residential behavior program, were from actual AMP billing records and compared the test group, those that received the printed HER, to the control group that did not receive HERs. Opower, the vendor responsible for My Energy, provided these calculations.

Complimentary Programs

- Renewable Energy Programs*:*
  Alameda Green, AMP's optional green power program, provides customers with the option to choose 100 percent renewable energy at an additional cost of $0.015/kWh. In 2015 AMP rolled out a successful residential outreach campaign which resulted in 1,016 new participants. Currently, there are 2,083 residential and 73 commercial customers enrolled in Alameda Green. AMP staff encouraged enrollment through Alameda Green mentions in the AMP's residential newsletter - The Flash, four bill inserts, social media, a commercial district outreach, and a contest among Customer Service Representatives.

- Low-Income Programs:
  AMP continues to provide financial assistance to Alameda's low-income families through the EASE (Energy Assistance Through Supportive Efforts) and EAP (Energy Assistance Program) programs. For FY 2015, EASE, an emergency relief program, helped 61 households receive a total of $4,881.25 in electric bill assistance. A maximum amount of $200 is available per household within a three-year period through the EASE program.

  EAP provides a 25 percent monthly discount on the electric bill. A total of $76,470.43 was allocated to 626 Alameda households. These programs are funded through the public purpose component of AMP's energy charge.

- Research, Development, and Demonstration:
  There was no AMP activity in research, development, and demonstration in 2015.

- Electric Vehicles:
  By the end of FY 2015, there were 291 AMP customers registered to receive the electric vehicle (EV) discount. Staff developed rates for Level 1, 2, and 3 EV chargers, which went into effect on July 1, 2015.

  AMP participated in a joint grant application with the Bay Area Air Quality Management District (BAAQMD) and was chosen for an $85,000 grant for publicly available electric vehicle charging infrastructure from the CEC. The grant covered a majority of the costs for AMP to install two Level

3 fast chargers in its public parking lot at 2000 Grand Street. Installation of these fast chargers began on June 2, 2015, and they were fully operational as of October 23, 2015.

Additionally, in June 2015 AMP received approval to purchase one battery EV and one plug-in hybrid EV to be used as pool cars. Another EV was purchase in FY 2016. AMP installed with two dual port Level 2 chargers, which can charge up to four electric vehicles at a time, in its back parking lot to accommodate its new and future EVs. These chargers were operational as of November 2, 2015.

- Energy Storage:
  AMP does not have any onsite storage, nor do any customers have onsite storage. An evaluation of energy storage was done in 2014 as required by California AB 2514. No updates to the evaluation were done in FY 2015. The evaluation concluded that energy storage was not cost effective at this time. However, AMP continues to evaluate the potential for this technology and in FY 2015 staff attended a storage exhibit and has met with several different vendors interested in providing storage in Alameda.

ALAMEDA MUNICIPAL POWER – FY 2014/2015 ENERGY EFFICIENCY RESULTS

Alameda		Resource Savings Summary									Cost Summary			
Program Sector (Used in CEC Report)	Category	Units Installed	Gross Coincident Peak Savings (kW)	Gross Annual Energy Savings (kWh)	Gross Lifecycle Energy Savings (kWh)	Net Coincident Peak Savings (kW)	Net Annual Energy Savings (kWh)	Net Lifecycle Energy Savings (kWh)	Net Lifecycle Gas Savings (MMBtu)	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)	Utility ($/kWh)
Appliances	Res Clothes Washers													
HVAC	Res Cooling													
Appliances	Res Dishwashers													
Consumer Electronics	Res Electronics													
HVAC	Res Heating													
Lighting	Res Lighting	5	1,723	929,477	13,934,235	937	505,300	7,575,230		3,812	$373,649	$175,166	$548,815	$0.10
Pool Pump	Res Pool Pump													
Refrigeration	Res Refrigeration	243	16	95,850	606,548	11	67,095	424,584		230	$15,720	$25,092	$40,812	$0.12
HVAC	Res Shell													
Water Heating	Res Water Heating													
Comprehensive	Res Comprehensive	14,144		1,369,139	1,369,139		1,369,139	1,369,139		773		$258,792	$258,792	$0.20
Process	Non-Res Cooking													
HVAC	Non-Res Cooling													
HVAC	Non-Res Heating													
Lighting	Non-Res Lighting	13	140	499,581	7,424,185	112	399,665	5,939,348		3,291	$90,109	$206,018	$296,127	$0.07
Process	Non-Res Motors													
Process	Non-Res Pumps													
Refrigeration	Non-Res Refrigeration													
HVAC	Non-Res Shell													
Process	Non-Res Process	1		5,044	75,660		5,044	75,660		40	$555	$2,111	$2,666	$0.05
Comprehensive	Non-Res Comprehensive	1	13	55,311	829,665	11	44,249	663,732		369	$8,297	$21,077	$29,373	$0.06
Other	Other													
SubTotal		14,407	1,892	2,954,402	24,239,432	1,071	2,390,492	16,047,693		8,516	$488,329	$688,256	$1,176,585	$0.10
T&D	T&D													
Total		14,407	1,892	2,954,402	24,239,432	1,071	2,390,492	16,047,693		8,516	$488,329	$688,256	$1,176,585	

EE Program Portfolio	TRC Test	**1.25**
	PAC Test	**1.28**

Excluding T&D

ANAHEIM PUBLIC UTILITIES

Anaheim Public Utilities at a Glance

- Established in 1894
- Climate Zone 8
- 178,827 meters, 115,682 are electric and 63,145 are water
- Percent of electric retail sales by customer class – 24.9% residential, 32.7% commercial, 42% industrial and .4% miscellaneous
- Budgeted amount for energy efficiency programs: $4,553,803
    - Amount expended: $5,577,292
    - Funding source: Electric Revenue

Anaheim Public Utilities Overview

Anaheim Public Utilities (APU) provides electricity and water to a community of 360,000 residents, approximately 9,500 businesses, and more than 20 million annual visitors over an area that covers more than 50 square miles. The Anaheim Resort, Anaheim Canyon and the Platinum Triangle account for a large proportion of the energy and water consumed in Anaheim, and contribute significant energy use and tax based revenues to the City's General Fund. There was a significant upturn in economic development in FY14-15 and it is anticipated that approximately $3.7 billion will be invested in the Platinum Triangle and Anaheim Resort areas in the next 2 years. The Anaheim Convention Center announced plans and has received approval for a 200,000 square foot expansion to increase the number of conventions, shows and visitors to the City; its anticipated completion date is May 2017. In FY14-15 new development included 3 hotels in Anaheim Resort Area, and 28 industrial buildings in the Anaheim Canyon. As of April 2015, 1,900 new dwelling units were completed, and 1,400 dwelling units were under construction in the Platinum Triangle Area.

The California 2013 Title 24 Building Energy Efficiency Standards continued to impact the quantity and types of energy efficiency projects undertaken by APU customers, particularly in the area of commercial lighting projects. The increased costs for additional equipment and controls resulted in fewer large scale commercial lighting retrofits in fiscal year 2014-15.

APU customers continued to pursue their interest in alternative sources of electricity to meet their personal and business needs. This was achieved predominantly through the installation of solar energy systems. APU estimates that over 2,000 solar energy systems totaling about 20 megawatts will be built throughout Anaheim by the end of 2016. While APU strongly recommends customers incorporate energy efficiency into their overall property performance prior to installing a solar system, customer interest in solar energy remains high. The loading order of the State to require energy efficiency before securing new sources of supply is even more critical now, as demonstrated by the "Duck Curve" graph depicted by the CA Independent System Operator.

Major Program Changes

APU modified its energy efficiency program portfolio in FY14-15 to take advantage of new opportunities, changes in technology and address the challenges presented by the new codes and standards. We implemented an LED distribution program and improved the incentive structure on projects that implemented newer technologies, such as chiller and lighting retrofits. The new incentive structure is aimed at encouraging high end, deeper dive energy saving project investments by large commercial and industrial customers with the potential for significant energy savings. Customers can receive up to $0.15 per kWh or $400 per kW saved.

Program Highlight

APU's Customized Energy Incentives Program provides its commercial and industrial customers with the greatest flexibility in selecting energy efficiency projects that provide them with the greatest return on their investment. Customers appreciate the opportunity to select improvements that are specific to their operation, particularly if their greatest energy savings strategies may not be for measures that fall into a prescriptive menu. In addition to the incentives offered for new construction and retrofit applications, customers can also receive a free specialized or comprehensive energy audit for their facility. This assists them in identifying the greatest energy consuming end uses as well as the energy savings potential and payback for their investment. This comprehensive approach provides the greatest overall energy savings for our customers and provides APU with a significant contribution towards its overall energy savings goal.

Current Commercial Customer Programs Descriptions

Total annual program cost: $1,420,779

Resulting in: 6,122.5 kilowatt demand reduction and 24,598,938 kilowatt-hour savings

Non-Res Cooling

- Customized Energy Incentives Program - Customized financial incentives for installation of high-efficiency air conditioning, motors, controls and other production related equipment.
- Comprehensive Energy Audits - Customized on-site audits and recommendations designed to improve energy operating efficiency and help customers reduce costs.
- Operations Program – Produces energy savings by turning off large transformers that are not serving customers' loads.
- Codes and Standards - Savings are drawn from the Statewide allocation of energy savings credits for FY 2014/2015 due to Codes and Standards, based on Anaheim's percent share of statewide load.
- Upstream HVAC - Provides rebates to the sales channel that most influences the stocking and selling of qualifying high efficiency equipment; the goal is to facilitate the purchase of the high efficiency equipment by the end-use customer.

Non-Res Heating

- Heat Pump Incentives Program - Encourage installation of high-efficiency heat pumps.

Non-Res Lighting

- Lighting Incentives – Provides incentives to improve energy efficiency for a variety of lighting applications.
- Exit Sign Incentive Program - Financial incentives for up to 50 percent of the cost to retrofit incandescent bulbs or fluorescent lamps in exit signs with more efficient exit sign lighting technology.
- Small Business Energy Management Assistance Program - Provides customers of less than 50 kilowatt demand with energy use evaluations, retrofit funding, and installation assistance; focusing on lighting upgrades, programmable thermostats, air conditioning, and refrigeration tune-ups.
- Small/Medium Business Audits - Customized on-site audits and recommendations designed to improve energy operating efficiency and help customers reduce costs.

Non-Res Comprehensive

- Air Compressor Program – Provides free comprehensive audits which approach this technology and its operation on a systemic basis and awards incentives for installing qualifying system components which improve energy system efficiency.

Other

Resulting in 604,241 kilowatt-hour savings (water/energy nexus)

- Commercial & Residential Water Savings Resulting from Equipment Rebates -Businesses and residents are eligible for rebates by installing or retrofitting with qualifying water-saving devices through the "SoCal Water$mart " Program in partnership with Metropolitan Water District. Water savings result from the application of measures such as;
    - Landscape Performance
    - Rotating Nozzle Rebates
    - SmarTimer Rebates

Current Residential Customer Programs Descriptions

Total annual Program Costs: $1,816,574

Resulting in: 3,908.1 kilowatt demand reduction and 5,690,817 kilowatt-hour savings.

Res Cooling

- Air Duct Replacement – Provides incentives to residential customers who replace old air duct systems.
- TreePower - Provides complimentary shade trees and incentives for residential customers. Shade trees, when properly placed, can help reduce air conditioning costs.

- Weatherization – Income qualified program that provides plug load occupancy sensors, LED bulbs, CFL torchieres, duct sealing, refrigerant charge testing and Energy Star room air conditioners.

Res Lighting

- On-Line Home Utility Check-Up - Customers can click on Public Utilities to complete a detailed survey online. Either way, customers receive money saving advice, and learn about incentives designed to help them be more water and energy efficient.
- Home Utility Check-Up Equipment-CFL and LED Direct Install - A customized in-home survey of water and energy use and existing appliances. Customers receive free installation of up to five LEDs.
- Home Utility Check-Up - Audits - A customized in-home audit of water and energy use and existing appliances.
- LED Library Distribution and LED Distribution – Distribution of two 8.5 watt 800 lumen bulbs to residents via Anaheim's Public Libraries and distribution via direct mail to 46,259 residents.
- Inside the Outdoors – Educational program for children which provides camp environment, home survey material and LED lights.
- Holiday Lights Exchange – Provides holiday lights to residents who turn in old incandescent holiday lights.

Res Refrigeration

- Home Incentives - Rebates for purchase and installation of high efficiency ENERGY STAR® rated appliances and high efficiency conservation measures.
- Refrigerator Recycling Program – Provides a rebate to customers who recycle an old, operational refrigerator or freezer.

EM&V

APU has completed their EM&V analysis for both its Small Business Energy Management Assistance Program and its Small/Medium Business Refrigeration Program. The reports are currently being reviewed prior to publication and the anticipated publication is the first quarter of the FY15/16. Negotiations are underway to initiate an EM&V analysis of the Upstream HVAC program.

Sources of Energy Savings

The sources of energy savings used to calculate program performance. We relied on the TRM where applicable. In addition, utility workpaper were used.

Complimentary Programs

- Neighborhood Comprehensive Revitalization: Provides comprehensive revitalization and retrofits to existing income-qualified neighborhood developments. Funding is provided to install high efficiency conservation measures and Energy Star appliances.

- Lighten-Up CFL Fundraiser: Provides free LEDs to students to sell as a fund raising activity to attend outdoor environmental camp (or other specified extracurricular activity).
- Large Landscape Water Use Surveys: Customers receive expert analysis of outdoor landscape water use, specific irrigation system upgrade recommendations, and an explanation how incentives may help fund improvements.
- Economic Development/Business Retention Rate**:** Qualifying businesses receive rate discounts with an efficiency measures installation component.
- New Construction: Customers receive design assistance and incentives for new construction and facility expansions that install energy-efficient equipment that exceed Title 24.

Renewable Energy Programs:

- Green Power Program: Customers pay an extra charge to support renewables. The funds go towards purchasing solar, wind, geothermal, hydroelectric and other forms of renewable generation.
- Solar Energy Incentives: Customers and schools can receive incentives for systems that do not exceed 100% of their historic consumption. In addition, permit fees are waived.

Low-Income Programs:

- Income-Qualified Senior or Disabled Energy Credit: Provides a 10 percent reduction on the electric portion of bills to seniors, military veterans or long-term disabled customers at or below 80 percent of the Orange County median income.
- Dusk to Dawn Income-Qualified Assistance: In addition to receiving a free outdoor light, income-qualified residents may also have the light installed by one of Anaheim's approved and licensed electrical contractors free of charge.
- Emergency Assistance: Provides a one-time electric utility payment for customers in economic hardship.

Research, Development, and Demonstration:

- Plug-in Electric Vehicles Incentives – Customers are reimbursed for out-of-pocket expenses up to $1,000 per charger. Eligible expenses include the charger purchase price, and installation costs. In addition to the $1,000 rebate, permit application fees related to the installation of the EV charger are waived.

ANAHEIM PUBLIC UTILITIES – FY 2014/2015 ENERGY EFFICIENCY RESULTS

Anaheim		Resource Savings Summary									Cost Summary			
Program Sector (Used in CEC Report)	Category	Units Installed	Gross Coincident Peak Savings (kW)	Gross Annual Energy Savings (kWh)	Gross Lifecycle Energy Savings (kWh)	Net Coincident Peak Savings (kW)	Net Annual Energy Savings (kWh)	Net Lifecycle Energy Savings (kWh)	Net Lifecycle Gas Savings (MMBtu)	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)	Utility ($/kWh)
Appliances	Res Clothes Washers													
HVAC	Res Cooling	3	496	612,388	8,640,518	496	612,388	8,640,518		5,512	$474,698		$474,698	$0.08
Appliances	Res Dishwashers													
Consumer Electronics	Res Electronics													
HVAC	Res Heating													
Lighting	Res Lighting	6	2,895	4,068,224	58,836,569	2,895	4,068,224	58,836,569		33,373	$1,002,249		$1,002,249	$0.03
Pool Pump	Res Pool Pump													
Refrigeration	Res Refrigeration	2	226	691,439	5,833,235	226	691,439	5,833,235		3,292	$339,627		$339,627	$0.07
HVAC	Res Shell													
Water Heating	Res Water Heating													
Comprehensive	Res Comprehensive													
Process	Non-Res Cooking													
HVAC	Non-Res Cooling	5	4,702	18,095,986	149,468,132	4,702	18,095,986	149,468,132		96,237	$597,626		$597,626	$0.01
HVAC	Non-Res Heating	1	294	1,233,123	13,564,353	294	1,233,123	13,564,353		8,239	$61,594		$61,594	$0.01
Lighting	Non-Res Lighting	5	1,346	5,185,442	55,271,492	1,346	5,185,442	55,271,492		32,736	$643,150		$643,150	$0.02
Process	Non-Res Motors													
Process	Non-Res Pumps													
Refrigeration	Non-Res Refrigeration	1	71	402,137	4,423,502	71	402,137	4,423,502		2,465	$121,108		$121,108	$0.04
HVAC	Non-Res Shell													
Process	Non-Res Process													
Comprehensive	Non-Res Comprehensive	1		1,017	15,255		1,017	15,255		9	$5,528		$5,528	$0.51
Other	Other	1		604,241	5,438,172		604,241	5,438,172		3,335				
SubTotal		25	10,031	30,893,997	301,491,228	10,031	30,893,997	301,491,228		185,198	$3,245,580		$3,245,580	$0.02
T&D	T&D													
Total		25	10,031	30,893,997	301,491,228	10,031	30,893,997	301,491,228		185,198	$3,245,580		$3,245,580	

EE Program Portfolio	TRC Test	**13.35**
	PAC Test	**13.74**

Excluding T&D

AZUSA LIGHT & WATER

Azusa Light & Water At a Glance

- The City of Azusa was incorporated in 1898, the water utility established in 1900 and the electric utility followed shortly after in 1904
- Climate Zone 9
- The utility serves approximately 16,500 retail electric customers in a community of approximately 47,842 residents (2013)
- Percent of retail sales by customer class – 40% residential, 60% commercial/industrial
- Budgeted amount for energy efficiency programs was ($1,094,890), amount actually expended ($721,334) and customer line item utility charge funding sources ($1,162,171); specify if unused, EE dollars are reallocated to other Public Benefits program (no excess)
- Annual load growth was approximately 1%

[Utility Name] Overview

Since inception of the energy efficiency programs, Azusa Light & Water has expended over $10 Million toward providing energy conservation information to the Azusa community and rewarding businesses and residents for upgrading inefficient energy consuming equipment with more energy efficient equipment. These efforts have resulted in an annual peak demand and energy use reductions of approximately one percent.

Major Program Changes

Over the last fiscal year the energy efficiency programs have been maintained at about the same levels of participation, however they have been refined by reducing the amount of incentives for the less cost effective measures.

Program Highlight

The Small Business Audit/Retrofit Program and the "Keep Your Cool" direct install programs continue to provide the greatest impact on meeting the needs of the harder to reach businesses and small retailers within the service territory. These hard to reach customers have a very tight cash flow and in many times are unable to participate in the rebate programs unless there is little to no up-front monetary outlay. Both of these programs allow the customers to immediately see the savings and avoid the initial cash outlay associated with the typical rebate type programs.

Commercial and Industrial Customer Programs:

- Business Partnership Program: Retrofit existing buildings and factories with high efficiency lighting, air conditioning and process equipment.
- Free Energy Audits: Provide suggestions on the most energy efficient equipment and more cost effective methods of operations.

- New Business Retrofit Program: Encourage the use of the most energy efficient equipment in the design and construction of new buildings and factories.
- Small Business Audit/Retrofit Program: Provide free utility audit, free CFL retrofit, free packaged A/C tune-ups, the first $1,500 free lighting retrofit and recommendations for further energy saving measures with a corresponding 50% rebate up to a maximum rebate of $10,000 per customer account.
- "Keep Your Cool Audit/Retrofit Program": Provide free utility audit, free LED case lighting retrofits, free refrigeration tune-ups, free case seal replacements, auto door closers and fan controllers.

Residential Programs Descriptions

- Home Weatherization Rebate Program: Rebates are offered for a variety of home weatherization measures.
- EnergyStar® Appliance Program: Rebates are offered for most high efficiency appliances that have the EnergyStar® rating, including but not limited to, refrigerators, air conditions, LED Televisions and computer monitors, dishwashers, clothes washers, pool pumps, ceiling fans and various lighting measures.
- Free Home-in-Home Energy Audits: Provide recommendations for the effective use of energy within the residence.
- Free On-Line Home Energy Audit Program: Customers can enter various parameters that match their home and lifestyle, and receive an immediate list of conservation recommendations and measures along with an estimate of what each appliance within the home is using in the way of energy.

Public Facilities Program Description

- Program guidelines are essentially the same as the current commercial and industrial programs; therefore they are included in that category for funding and savings.

City Schools Program Description

- LivingWise: Provide an interactive 6th grade conservation education program to all 6th grade classes within the City of Azusa, both private and public.

EM&V

Azusa Light & Water contracted with Lincus Energy in 2010 to complete a study of the various FY 2008-09 energy efficiency programs and associated savings. The Lincus study is available on the CMUA website and the Azusa light & Water website (http://www.ci.azusa.ca.us/DocumentCenter/View/26058). Azusa Light & Water will continue to make EM&V reports available to the CEC and other parties as they are completed and will continue with its EM&V programs and practices in the future.

Sources of Energy Savings

For savings, Azusa Light & Water uses a combination of figures from TRM, E3, utility work papers and custom savings analysis and vendor calculations when applicable.

Complimentary Programs

- Low-Income Programs: The Azusa Light & Water Low Income Assistance Program is outlined in Rule No. 18 of Azusa Light & Water's Rules and Regulations. Interested customers are required to fill out an application and provide documentation of income. In general, Azusa Light & Water's guidelines for qualifying customers follow the low income thresholds used by the State.
- Research, Development, and Demonstration: Azusa Light & Water has, jointly with the Southern California Public Power Authority (SCPPA), is an active member of the APPA DEED Program.

AZUSA LIGHT & WATER – FY 2014/2015 ENERGY EFFICIENCY RESULTS

Azusa		Resource Savings Summary									Cost Summary			
Program Sector (Used in CEC Report)	Category	Units Installed	Gross Coincident Peak Savings (kW)	Gross Annual Energy Savings (kWh)	Gross Lifecycle Energy Savings (kWh)	Net Coincident Peak Savings (kW)	Net Annual Energy Savings (kWh)	Net Lifecycle Energy Savings (kWh)	Net Lifecycle Gas Savings (MMBtu)	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)	Utility ($/kWh)
Appliances	Res Clothes Washers													
HVAC	Res Cooling													
Appliances	Res Dishwashers													
Consumer Electronics	Res Electronics	3	2	5,246	47,214	2	5,246	47,214		28	$4,347	$226	$4,573	$0.12
HVAC	Res Heating													
Lighting	Res Lighting													
Pool Pump	Res Pool Pump													
Refrigeration	Res Refrigeration													
HVAC	Res Shell	1	6	20,249	607,470	6	20,249	607,470		362	$25,876	$2,451	$28,327	$0.09
Water Heating	Res Water Heating													
Comprehensive	Res Comprehensive	3	25	379,399	1,523,097	20	303,519	1,218,478		725	$89,049	$5,510	$94,559	$0.09
Process	Non-Res Cooking													
HVAC	Non-Res Cooling	8	46	314,827	4,709,367	46	314,827	4,709,367		3,012	$122,477	$28,618	$151,095	$0.04
HVAC	Non-Res Heating													
Lighting	Non-Res Lighting	13	148	883,550	8,709,879	128	738,313	7,402,742		4,384	$63,934	$35,176	$99,110	$0.02
Process	Non-Res Motors	3	41	85,520	1,282,800	41	85,520	1,282,800		715	$30,000	$5,062	$35,062	$0.04
Process	Non-Res Pumps	1	59	919,173	2,757,519	59	919,173	2,757,519		1,537		$10,992	$10,992	
Refrigeration	Non-Res Refrigeration	8	30	242,559	2,548,260	30	242,559	2,548,260		1,420	$81,809	$10,233	$92,042	$0.05
HVAC	Non-Res Shell	4	2,132	1,392,057	14,310,344	1,479	982,092	10,195,116		6,192	$50,802	$55,647	$106,449	$0.01
Process	Non-Res Process													
Comprehensive	Non-Res Comprehensive	1	46	125,335	1,253,350	46	125,335	1,253,350		761	$92,261	$6,863	$99,124	$0.10
Other	Other													
SubTotal		45	2,533	4,367,915	37,749,300	1,856	3,736,832	32,022,316		19,137	$560,556	$160,778	$721,334	$0.03
T&D	T&D													
Total		45	2,533	4,367,915	37,749,300	1,856	3,736,832	32,022,316		19,137	$560,556	$160,778	$721,334	

EE Program Portfolio	TRC Test	**3.50**
	PAC Test	**5.65**

Excluding T&D

City of Banning At a Glance

- Established in 1922.
- 27 employees.
- Of the 11,872 customers, 91% are residential.
- Average demand during FY 14/15 was 16.8 MW, down 0.6% from the prior period.
- Peak demand during FY 14/15 was 42.4 MW, up 4.7% from the prior period. Peak demand is primarily due to air conditioning load during the summer.
- Retail energy sales in FY 14/15 were 144,994,428 kWh, up 4.4% from the prior period. Retail sales are broken down as 47 percent residential and 53 percent commercial/industrial/institutional.

Utility Overview

During FY 14/15, Banning spent $162,189 in Energy Efficiency programs, which have provided 230,597 kWh energy savings. It should be noted that the City of Banning is located in an economically disadvantaged area. A significant portion of the City's population is either low income or senior citizens living on a fixed income. Due to the economic demographics of Banning's population, the majority of Public Benefits dollars are utilized to provide low-income assistance through reduced rates.

Major Program Changes

One of Banning's main goals for FY 2014/15 was to expand participation in its commercial retrofit and refrigeration programs, primarily through the adoption of significantly increased monetary incentives for low-income businesses. To accomplish this goal, in 2015 the Utility implemented a new program for business customers called the Business Energy Efficiency Funds, or "B.E.E.F." For businesses deciding to participate in the program, an independent energy-efficiency specialist conducts a small-business energy survey to identify lighting, refrigeration, motors, air conditioning tune-ups, and other qualifying potential energy-efficiency upgrades. There is no cost to the business for this energy survey. A report is generated listing recommended energy-efficient retrofits. Each recommendation includes the cost to perform the retrofit, anticipated annual energy savings, and simple payback.

Businesses will then have the option to select the recommendations they consider a priority to install, based upon the anticipated savings and the cost of the energy-efficiency upgrades. Once the selection is finalized, certified installers are scheduled to complete the work at the facility. The Utility will pay up to $2,750 for the recommended retrofits selected, with no or minimal copays to the business. The following table gives examples of the copays at differing levels of upgrade costs:

Upgrade Costs	Business's Copay	Amount Paid by Utility
$1,000	$0	$1,000
$2,000	$100	$1,900
$3,000	$250	$2,750

The B.E.E.F. program has been well received by the City's business community, and participation has been strong.

Program Descriptions

- Air Conditioner: Monetary incentives to replace an existing central air conditioning unit with a new high-efficiency unit.
- EnergyStar® Appliances: Monetary incentives for purchasing products that meet the Energy Star®" criteria.
- EnergyStar® Refrigerator: A monetary incentive for replacing an old inefficient refrigerator with a new energy efficient unit.
- Recycle: Rebates offered to remove and recycle operating old and inefficient refrigerators and freezers.
- Energy Weatherization: Monetary incentives to replace inefficient materials with products that will improve the energy efficiency of their facility and reduce energy use.
- Shade Tree: Rebates offered to plant shade trees around homes to help reduce the amount of energy used for air conditioning.
- Commercial Programs: Monetary incentives for commercial customers to install more energy-efficient equipment such as lighting, signage, refrigeration, etc.
- New Construction: Monetary incentives for new construction projects that exceed the energy efficiency above California's Title 24 standards.
- Energy Audits: Provides customers with a variety of recommendations for reducing energy consumption.
- Low Income Assistance: An electric utility reduced Baseline Rate for qualified customers. As mentioned above, the majority of the Public Benefits funds are spent providing low income assistance.

EM&V

The City of Banning Electric Utility has hired third-party firms, such as Lincus, Inc., to perform EM&V studies in previous years. The City will continue with its EM&V programs and practices.

Complimentary Programs

Renewable Portfolio Standard. The City of Banning is committed to reaching 33 percent renewables by 2020 and 50 percent by 2030. In support of this goal, Banning is doing all of the following:

- The City has contracted for geothermal energy from two generating facilities. Together they supply approximately 15 percent of the City's energy need.

- The City has reached an agreement to divest itself of its interest in the San Juan Generating Station Unit 3 by 2017. Once this divestiture is complete, the City will be replacing this coal-based energy with renewable energy. The City has already signed long-term renewable energy contracts that will increase the City's renewables to greater than 70% of retail sales by 2018.
- Banning has met its California SB1 requirements by providing $2.4 million in rebates for the installation of solar photovoltaic systems in its service territory. The rebates have helped install approximately 0.75MW of customer-owned solar photovoltaic capacity in the city.

Electric Vehicles. The State of California has set a goal of having 1.5 million zero emission vehicles on the roads by 2025. It is anticipated that the majority of these zero emission vehicles will be electric vehicles. As battery storage technology improves, the costs for electric vehicles will continue to decline, which will result in a higher participation in electrical vehicle ownership within the Utility's territory. In anticipation of these changes, the City recently received a grant to have an electrical vehicle public charging station constructed in the McDonald's parking lot.

CITY OF BANNING – FY 2014/2015 ENERGY EFFICIENCY RESULTS

Banning		Resource Savings Summary									Cost Summary			
Program Sector (Used in CEC Report)	Category	Units Installed	Gross Coincident Peak Savings (kW)	Gross Annual Energy Savings (kWh)	Gross Lifecycle Energy Savings (kWh)	Net Coincident Peak Savings (kW)	Net Annual Energy Savings (kWh)	Net Lifecycle Energy Savings (kWh)	Net Lifecycle Gas Savings (MMBtu)	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)	Utility ($/kWh)
Appliances	Res Clothes Washers	17		2,557	28,127		2,429	26,721		16	$850	$733	$1,583	$0.08
HVAC	Res Cooling	76	5	10,479	156,153	4	9,955	148,345		94	$13,800	$5,896	$19,696	$0.19
Appliances	Res Dishwashers	15		870	8,700		827	8,265		5	$750	$214	$964	$0.15
Consumer Electronics	Res Electronics													
HVAC	Res Heating													
Lighting	Res Lighting													
Pool Pump	Res Pool Pump													
Refrigeration	Res Refrigeration	63	2	18,023	141,442	2	17,122	134,370		76	$4,075	$3,381	$7,456	$0.07
HVAC	Res Shell	1,412		56,430	1,127,090		53,609	1,070,736		637	$8,599	$27,988	$36,587	$0.05
Water Heating	Res Water Heating													
Comprehensive	Res Comprehensive													
Process	Non-Res Cooking													
HVAC	Non-Res Cooling													
HVAC	Non-Res Heating													
Lighting	Non-Res Lighting	812	4,203	134,593	1,341,278	3,993	127,863	1,274,214		755	$53,810	$36,279	$90,089	$0.09
Process	Non-Res Motors													
Process	Non-Res Pumps													
Refrigeration	Non-Res Refrigeration	22	12	7,645	85,218	11	7,263	80,957		45	$3,893	$1,920	$5,813	$0.10
HVAC	Non-Res Shell													
Process	Non-Res Process													
Comprehensive	Non-Res Comprehensive													
Other	Other													
SubTotal		2,417	4,222	230,597	2,888,008	4,011	219,067	2,743,608		1,628	$85,777	$76,412	$162,189	$0.08
T&D	T&D													
Total		2,417	4,222	230,597	2,888,008	4,011	219,067	2,743,608		1,628	$85,777	$76,412	$162,189	

EE Program Portfolio	TRC Test	**2.00**
	PAC Test	**2.00**

Excluding T&D

Biggs Municipal Utilities at a Glance

- Electric utility established in 1904
- Biggs is located in climate zone 11
- The electric utility has 736 retail customer connections servicing 698 retail customers
- Percent of retail sales by customer class are as follows: residential, 33%, commercial, 8% and industrial, 59%
- Budgeted amount for energy efficiency programs for FY 14/15 was $8,572.00 The amount actually expended was $4,873.94, funded through a 2.85% Public Benefits Surcharge. Unallocated funds were re-appropriated to augment funding for our Solar PV Incentive Program.
- The City again faced negative load growth in fiscal year 14/15 with a drop of 15%. Industrial load dropped by 25%, which was partially offset by increased residential and commercial load.

Utility Overview

Economic conditions in Biggs and the surrounding communities remain stagnant, dampening customer enthusiasm for any investments in energy efficiency measures. Our customers who do have disposable income are choosing to invest in solar P.V. rather than energy efficiency measures. Of the 37 commercial properties we serve, 15 are empty and 9 are simply relay stations for cable, telephone service or rail road signals. An additional 4 are church properties used once or twice a week, so rebates for upgrades to their efficiency levels is not cost effective. Our summer cooling load is relatively high, due to our high summer temperatures and aging housing stock, but customers will not work with the city to replace aging systems unless rebate levels rise far beyond what is currently offered. Again, there is no *cost effective* way to make these rebates available to our customers.

Major Program Changes

There have been no major changes in programs offered or budgeted funds for energy efficiency programs during this reporting cycle. With low customer participation, budgets were lowered and some unused funds were re-appropriated to support our Solar PV Program.

Program Highlight

The program that had the greatest impact was the custom Biggs Unified School District Exterior Lighting Retrofit Program. Though savings weren't huge, the new LED lighting provides much better lighting and a safer environment for students and staff that are there in the evening or early morning hours.

Program Descriptions

- Commercial Lighting Program: Customized Lighting Retrofit Rebate Program available to all commercial customers and educational facilities.

- Commercial HVAC Program : Customized HVAC Retrofit & Optimization Program provides generous incentives for businesses and educational facilities to update aging HVAC units or tune-up units that don't need replacement.
- Residential Appliance Program: This program offers incentives to residential customers for the purchase of Energy-Star rated refrigerators and the recycling older units.
- Residential HVAC Program: Tiered incentives for replacement of aging HVAC units at residential properties. The greater the SEER level above Title 24 requirements, the greater the potential incentive. The Res. HVAC program also provides incentives for tune-ups of HVAC units and the installation of 7-day programmable thermostats.
- Residential Shell Program: This program offers incentives for increasing insulation levels and installation of dual-pane windows to replace single-pane. Future programs may include whole-house air sealing.

EM&V

In 2007, in response to AB 2021, Biggs hired a third-party contractor to formulate an EM & V plan. In 2008, 2009 & 2010, Biggs contracted with Navigant Consulting to perform Energy Efficiency Program Evaluation studies of all programs the city offers. Those studies can be found on the NCPA website and our city website. With the understanding that all programs need not be evaluated every year, Biggs moved to evaluation of all programs, in three year blocks. Biggs is currently working to find a consultant to perform multiple years worth of EM&V reports and have budgeted $10,000 toward fulfilling our EM&V requirement.

Sources of Energy Savings Data

Both the 2014 TRM and 2011 DEER were used to calculate savings. The commercial lighting project relied on the TRM lighting calculator.

Complimentary Public Benefits Programs

- Renewable Energy Programs: Biggs offers incentives to customers who install up to 3 kW of solar PV capacity for residential service and custom incentive programs for commercial customers.
- Low-Income Programs: Biggs works with Community Action Agency of Butte County to provide weatherization, appliance replacement, lighting replacement and HEAP grants to income-qualified household within our service territory.

CITY OF BIGGS – FY 2014/2015 ENERGY EFFICIENCY RESULTS

Biggs		Resource Savings Summary									Cost Summary			
Program Sector (Used in CEC Report)	Category	Units Installed	Gross Coincident Peak Savings (kW)	Gross Annual Energy Savings (kWh)	Gross Lifecycle Energy Savings (kWh)	Net Coincident Peak Savings (kW)	Net Annual Energy Savings (kWh)	Net Lifecycle Energy Savings (kWh)	Net Lifecycle Gas Savings (MMBtu)	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)	Utility ($/kWh)
Appliances	Res Clothes Washers													
HVAC	Res Cooling													
Appliances	Res Dishwashers													
Consumer Electronics	Res Electronics													
HVAC	Res Heating													
Lighting	Res Lighting													
Pool Pump	Res Pool Pump													
Refrigeration	Res Refrigeration													
HVAC	Res Shell	4	1	840	16,800	1	672	13,440		8	$393	$312	$705	$0.08
Water Heating	Res Water Heating													
Comprehensive	Res Comprehensive													
Process	Non-Res Cooking													
HVAC	Non-Res Cooling													
HVAC	Non-Res Heating													
Lighting	Non-Res Lighting	1		9,506	190,120		7,605	152,096		79	$1,520	$2,649	$4,168	$0.04
Process	Non-Res Motors													
Process	Non-Res Pumps													
Refrigeration	Non-Res Refrigeration													
HVAC	Non-Res Shell													
Process	Non-Res Process													
Comprehensive	Non-Res Comprehensive													
Other	Other													
SubTotal		5	1	10,346	206,920	1	8,277	165,536		86	$1,913	$2,961	$4,874	$0.05
T&D	T&D													
Total		5	1	10,346	206,920	1	8,277	165,536		86	$1,913	$2,961	$4,874	

EE Program Portfolio	TRC Test	**1.63**
	PAC Test	**2.96**

Excluding T&D

BURBANK WATER AND POWER

Burbank Water and Power (BWP) at a Glance

- Established in 1913.
- Located in Climate Zone 9.
- 43,000 residential and 6,500 commercial service connections, serving a total population of 105,000 residents and more than 3,300 businesses.
- 1,109 million kWh in total retail sales. Percent of retail sales by customer class – 25% residential, 75% commercial.
- The Fiscal Year (FY) 2014-15 budget for energy efficiency programs was $3.9 million. Of this, $3.4 million (87%) was spent. BWP's funding source for energy efficiency programs is the Public Benefits Charge. BWP can reallocate unspent budgeted dollars to other Public Benefits programs or, more typically, invests them in the following fiscal year. In FY 2015-16, BWP has budgeted $3.7 million for energy efficiency programs.
- Load growth is estimated at less than one percent per year, which we seek to offset through energy efficiency.

Utility Overview

Burbank is known as the Media Capital of the World, and is home to two of the world's largest studios, Warner Bros. and Disney. The city is also home to thousands of smaller businesses, many of whom moved to Burbank in the early 1990s after the aerospace industry contracted and real estate became plentiful and cheap. From BWP, these businesses have come to expect cost-effective and reliable electric service, as well as additional services such as fiber optic networking.

At the same time, Burbank has a vibrant residential community, with a housing mix of about 18,500 single family homes that ranges from post-war bungalows to two story view homes. There are also about 27,000 multifamily homes, a figure that continues to increase with infill and high-density development. As a result of nearly 20 years of energy efficiency history, increasingly stringent codes and standards, and a community ethos of sustainability, the average Burbank household uses less than 500 kWh per month. This efficient baseline makes it a challenge to design programs that can squeeze more energy efficiency juice out of an increasingly shrinking lemon.

BWP's energy efficiency portfolio has been designed to reflect our organizational goal of continuing to provide sustainable, affordable, and reliable service to all of our residents and businesses. At the same time, BWP is adjusting to changes in the utility industry, including concepts such as:

1. "Negative Load Growth," where energy efficiency and subsidized distributed generation are "fully" offsetting economic growth; and,
2. The "Duck Curve", where customer solar PV generation in the afternoon leads to a steep ramp up in the amount of electricity required to be supplied by the utility in the evening. This results in a

daily load profile that resembles a duck, invalidating current Time Of Use (TOU) rate design and resource planning criteria.

To address the operational challenges of the Duck Curve, in FY 2014-15, BWP implemented a first-of-its kind policy to restrict solar PV rebates to systems that are westerly-facing. This initiative, along with ongoing programs for efficient lighting upgrades, new rebates for smart thermostats, and higher rebates for ENERGY STAR central air conditioners and variable speed pool pumps, are discussed in further detail below.

Major Program Changes

BWP consistently evaluates each of our programs and reviews market conditions in order to improve services to residents and businesses. Research has consistently shown that energy efficiency program success is a three-legged stool, with the three legs represented by financial attractiveness, installation availability, and awareness. As a result, most of our programs are free for customers to participate and also have a direct install component. The remaining leg, awareness, is addressed through frequent print and digital communications to our customers emphasizing our role as a community utility. The following provides examples of how innovative communication methods can be incorporated into traditional energy efficiency programs to increase energy savings and customer engagement.

- Home Energy Reports – In FY 2014-15, BWP completed its third year implementing and operating mailed paper reports to residents that spur behavioral change and energy savings. The program saved nearly 3.5 million kWh and is BWP's largest and most cost-effective residential energy efficiency program. Along with a companion customer web portal, MyBWP, households can view their reports online, daily and hourly energy use, and a library of efficiency tips. BWP can also provide tailored tips that reduce evening electricity use and mitigate the effects of the Duck Curve.
- Energy Solutions – Currently open to any business customer, this program provides rebates for any type of energy efficiency project. In FY 2014-15, BWP continues to provide a double rebate for LED lighting projects of $0.10 per kWh of annual energy saved. This increased rebate has led to a more than 600 percent increase in the amount of savings from LED lighting projects. BWP also continues to send out a customized digital newsletter, known as "The Wire", to program participants and other large business customers that provides technical and operations assistance to save energy and water. The newsletter allows BWP to promote its rebate and other programs and gives customers the ability to interact with their key account managers and other industry experts.

Program Highlight

For residents, BWP's flagship program is Green Home House Call, available at no charge to participants. BWP introduced the program in November 2009 as a whole house, direct install program and has been expanding it ever since. The program was designed to reduce electric use and BWP has partnered with the Southern California Gas Company and the Metropolitan Water District of Southern California to leverage

additional funding and reduce natural gas and water use as well. The program has several components, including an in-home audit with energy and water education and installation of CFL and LED lamps and water savings devices. In addition, BWP assesses single family homes for additional services including the installation of attic insulation, duct testing and sealing, central air conditioning tune-ups and air sealing, as well as outdoor water conservation measures.

In FY 2014-15, BWP installed measures in more than 900 households, with an average savings of more than 800 kWh per household. In addition, BWP expanded its partnership with the Southern California Gas Company to provide even more extensive services for residents, including air sealing services for single family homes. Through the end of FY 2014-15, the program has served more than 5,800 households, or more than ten percent of all Burbank households, after less than six years of operation. With current changes to the program, many of our participating residents are now qualified to receive incentives through the state's Advanced Energy Upgrade California Program.

Program Descriptions

Instead of providing a detailed listing of specific programs, BWP staff has grouped programs by the associated sector-category classifications used in the E3 Reporting Tool summary table.

The following is a sampling of BWP's largest programs:

- Residential Cooling and Non-Residential Cooling: BWP provides services that address all aspects of space cooling for residential homes and commercial buildings, including rebates for the purchase of high-efficiency air conditioners and heat pumps, and free HVAC tune-ups. In FY 2014-15, BWP continues to be one of the few utilities in the country to offer rebates for smart thermostats, which can be controlled remotely and programmed automatically. BWP's combination of rebates for efficient equipment and controls makes it easier for customers to live comfortably during dry, hot summers while still reducing peak demand and saving energy.
- Residential Lighting: BWP provides free compact fluorescent and LED lamps to residents through our Green Home House Call program, as well as to participants in our Refrigerator Roundup program. In FY 2014-15, BWP provided residents with more than 1,550 LED lamps. The use of LED lamps is another proven strategy for mitigating the effects of the Duck Curve.
- Residential Refrigeration: BWP provides rebates for the purchase of ENERGY STAR refrigerators, and also provides new ENERGY STAR refrigerators at no cost to income-qualified customers. In addition, BWP also removes and recycles residents' second refrigerators at no cost in order to reduce their bills and lessen these older appliances' impact on the grid. Through these programs, more than 600 inefficient refrigerators were replaced with more efficient models.
- Non-Residential Lighting: BWP provides free direct installation services, including for high efficiency lighting, to all qualified small businesses in Burbank. In addition, BWP provides rebates per annual energy saved for customized lighting projects, including $0.10 per kWh double rebates for LED lighting.

EM&V

Along with most other POUs in California, BWP uses the E3 Reporting Tool to ensure accurate reporting of energy and peak demand savings and cost-effectiveness. In order to verify these savings, and meet the requirements of AB 2021, BWP also builds evaluation, measurement, and verification elements into every program and facilitates independent third-party studies. BWP's previous EM&V studies can be found at http://www.ncpa.com/current-issues/energy-efficiency-reports.html.

Complementary Public Benefits Programs

- Renewable Energy Programs: BWP continues to offer its Solar Support Rebate program to both residential and commercial customers. In FY 2014-15, the rebate for residential customers was $0.96 per watt installed, and $0.73 per watt installed for commercial customers. Due to falling equipment prices, our Solar Support program continues to be very popular and has been fully subscribed. At the same time, more than two-thirds of new residential solar photovoltaic (PV) systems are being installed without a rebate, which demonstrates the increasing cost-effectiveness of solar PV systems. In FY 2015-16, BWP continues to provide rebates only for solar PV systems that are westerly-facing, in order to minimize the effects of the Duck Curve.
- Low-Income Programs: BWP offers a Lifeline rate to about 2,000 income-qualified customers, which is a 50 percent discount off the standard residential rate, among the most generous in the state. BWP also developed the Refrigerator Exchange program for Lifeline customers to replace the existing primary, and often inefficient, refrigerator with an ENERGY STAR model at no cost to them. In addition, BWP requires Lifeline customers to participate in BWP's free Green Home House Call program to further reduce their electric, water, and natural gas bills.
- Research, Development and Demonstration: BWP operates a demonstration program of 34 Ice Bear units installed at City-owned buildings and large businesses. The Ice Bear is a peak-shifting thermal energy storage unit that works with air conditioners. The unit is simply a tank containing water that is frozen during off-peak hours; the ice is then used to provide cooling, in substitution of the air conditioner's compressor, during peak hours. In FY 2014-15, the units provided about 217 kW of peak demand capacity reduction. Also, in FY 2014-15, BWP implemented a pilot program targeting not-for-profit facilities. The goal of the program was to upgrade inefficient facilities in this cash-strapped sector and create demonstration centers of efficient technologies and operations. Three facilities received comprehensive audits followed by lighting retrofits with added controls, including occupancy sensors, daylight harvesting, and dimming capabilities; replacement of older HVAC units; and, in one case, replacement of an old and inefficient commercial refrigeration unit.

BURBANK WATER & POWER – FY 2014/2015 ENERGY EFFICIENCY RESULTS

Burbank		Resource Savings Summary									Cost Summary			
Program Sector (Used in CEC Report)	Category	Units Installed	Gross Coincident Peak Savings (kW)	Gross Annual Energy Savings (kWh)	Gross Lifecycle Energy Savings (kWh)	Net Coincident Peak Savings (kW)	Net Annual Energy Savings (kWh)	Net Lifecycle Energy Savings (kWh)	Net Lifecycle Gas Savings (MMBtu)	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)	Utility ($/kWh)
Appliances	Res Clothes Washers	490		18,130	199,430		5,620	61,823		37	$38,600	$343	$38,943	$0.72
HVAC	Res Cooling	5,139	718	584,332	6,258,111	713	577,024	6,169,149		3,980	$264,375	$155,279	$419,654	$0.08
Appliances	Res Dishwashers	402		10,452	104,520		6,271	62,712		37	$21,935	$328	$22,263	$0.40
Consumer Electronics	Res Electronics													
HVAC	Res Heating													
Lighting	Res Lighting	2,885	10	86,778	999,450	10	82,832	979,718		556	$52,643	$4,783	$57,426	$0.07
Pool Pump	Res Pool Pump	62	2	41,788	417,880	1	25,073	250,728		150	$16,100	$1,490	$17,590	$0.08
Refrigeration	Res Refrigeration	611	25	172,646	1,646,428	17	120,852	1,152,500		651	$112,363	$16,306	$128,669	$0.13
HVAC	Res Shell	250,551	253	304,570	5,260,850	177	192,245	3,605,606		2,147	$356,770	$20,684	$377,454	$0.13
Water Heating	Res Water Heating													
Comprehensive	Res Comprehensive	909		3,968,469	9,184,819		3,916,908	8,720,772		5,192	$328,287	$65,405	$393,692	$0.05
Process	Non-Res Cooking													
HVAC	Non-Res Cooling	517	834	3,324,005	48,318,275	834	3,324,005	48,318,275		30,907	$367,489	$387,055	$754,544	$0.02
HVAC	Non-Res Heating													
Lighting	Non-Res Lighting	7	1,143	5,172,771	54,774,649	1,143	5,172,771	54,774,649		32,442	$1,185,894	$369,256	$1,555,150	$0.03
Process	Non-Res Motors	1	8	23,073	346,095	8	23,073	346,095		193	$16,836	$3,016	$19,852	$0.07
Process	Non-Res Pumps													
Refrigeration	Non-Res Refrigeration	1	20	86,576	432,880	20	86,576	432,880		241	$5,533	$3,517	$9,050	$0.02
HVAC	Non-Res Shell	3	31	171,339	1,555,444	31	171,339	1,555,444		945	$449,548	$12,532	$462,080	$0.34
Process	Non-Res Process													
Comprehensive	Non-Res Comprehensive	1		35,610	284,880		35,610	284,880		173	$10,420	$3,248	$13,668	$0.05
Other	Other													
SubTotal		261,579	3,044	14,000,539	129,783,711	2,954	13,740,198	126,715,231		77,649	$3,226,792	$1,043,243	$4,270,035	$0.04
T&D	T&D													
Total		261,579	3,044	14,000,539	129,783,711	2,954	13,740,198	126,715,231		77,649	$3,226,792	$1,043,243	$4,270,035	

EE Program Portfolio	TRC Test	**2.64**
	PAC Test	**4.87**

Excluding T&D

CITY COLTON ELECTRIC DEPARTMENT

Colton Electric Utility at a Glance

- Colton Electric Department (CED) was established in 1895 by the City of Colton.
- CED is in Climate Zone 10.
- CED has 18,032 Retail customer connections. 15,816 Residential, 1,955 Commercial, 77 Industrial, and 184 Municipal.
- Percent of retail sales by customer class – Residential-28%, Commercial-19%, Industrial-51%, and other 2%.
- CED budgeted amount for energy efficiency programs was $980,194. The amount actually expended and funding sources was $388,744.31. All unused EE dollars are reallocated to other Public Benefits programs the following fiscal year.

Colton Electric Utility Overview

Fiscal year 2014/2015 expenditures continue to rise, and have increased 1.2% ($388,744.31 from $346,524.61) from the previous reporting year. To help increase the number of participants, CED went out to bid for marketing services to assist with EE rebate and program promotion beginning July 2015. CED expects to see a continued increase through fiscal year 2015/2016 with marketing assistance for programs developed.

Major Program Changes

CED continues to expand its program development by entering into additional Southern California Public Power Authority (SCPPA) contract agreements to provide more direct install EE measures for residential and commercial customers. As a result of SCPPA contract agreements CED piloted a hospitality program for commercial customers and launched the living Wise school program for schools in this reporting year.

Program Highlight

The Keep Your Cool (KYC) program continues to make the greatest impact in terms of energy savings. The program provided 313,415 kWh's of EE savings. These savings are from installation of Electronically Commutated (EC) motors which provided 39% of the gross annual kWh savings. 26% of the overall savings came from the installation of the LED Case-Lights. The case lights were an added measure to the program this reporting year.

The program that provided the greatest community impact and support was the Living Wise school program. This program provided Energy and Water Efficiency kits for all 6th grade students and curriculum to the teachers in the service territory of the CED. This was the first funded educational outreach program to students from CED. This program has become permanent based upon feedback from the students and teacher participants.

EM&V

CED budgeted $10,000 for EM&V for 2015/2016. Currently CED is utilizing the E3 reporting tool for EM&V.

- EE Rebates Non-Res: Commercial and industrial customers participated in lighting and equipment upgrades offering $0.05 per kWh saved on the projected first year's savings.
- EE Rebates Res: Residential customers participated in varying energy efficient upgrades installed in their homes such as A/C upgrade rebates. Rebates all have different refund amounts depending on measure installed.
- Refrigerator Replacement Program (ARCA): CED assisted customers with replacing old inefficient refrigerators with new energy efficient models. The utility provided the new units for $15 a month, billed for 12 consecutive months on the customer's account. Total unit cost to the customer is $180.
- A/C Tune-Up: CED entered into a professional services agreement with CSR, a third party vendor, to provide A/C Tune-ups to residents of Colton who sign up. To participate in the program, customers' A/C units could not exceed 5 tons. This was provided at no cost to the customer.
- KYC: Keep Your Cool was a new program offered to small commercial businesses with inefficient refrigeration, lighting and cooling. The program provided $3,000 per location in EE upgrades.
- Richard Heath & Associates (RHA) Res: Residential customers with annual energy usage of over 10,000 kWh or if previously participated in an energy audit received direct install EE measures.
- RHA Non-Res: Small business customers with less than 20 kW participated in an energy audit and direct install of EE measures.
- Hospitality: Commercial program for lodging/hotels that provides a whole building approach for energy efficiency. EE measures included in this program are: retrofits for lighting to LED's, insulation, HVAC controls, duct test and seal and pool and spa pump upgrades.
- Living Wise Program: School based energy efficiency education program, designed to generate long term resource savings by bringing interactive take home kits containing high efficiency measures they use to install within their home.
- ACCO: CED entered into a professional service agreement with ACCO to provide ASHRAE level 2 audits conducted for commercial and industrial customers with direct install potential.

Sources of Energy Savings

The sources used to calculate program performance were the TRM and DEER. The TRM was utilized for all measures that had not been updated in the 2014 Title 24 code changes.

Complimentary Programs

- Renewable Energy Programs: This reporting year Public Benefit Funds did not fund any renewable energy programs. The Electric Utility enterprise fund, funded solar photovoltaic rebates

for residential customers and funded the planning and construction of a community solar project expected to be completed end of FY2014/2015.

- Low-Income Programs: Low Income applicants were provided a one-time fiscal year credit of up to $50 on the electric portion of their utility bill and an entire year of 94 kWh added to tier 1 at lower .08 rate. This program change was the result of a program evaluation completed the previous reporting year.
- Research, Development, and Demonstration (RD&D): This reporting year CED did not participate in RD&D. CED will be partnering with SCPPA to participate in a solar heat pump application on a water well location to cool down the city's Water Department pumping station. This will be a joint study shared with other SCPPA utilities.
- Electric Vehicles: Colton Electric Utility is an active member of the Electric Vehicle Working Group through SCPPA. This reporting year CED was awarded grant funding from the California Energy Commission to install two Electric vehicle charging stations at two businesses located 1 mile from Freeway entrances. Both projects were completed and are operational. Two additional chargers were installed at the CED City yard to support electric vehicle fleet infrastructure.
- Energy Storage: Colton Electric Utility participated in an energy storage working group through SCPPA. Energy storage is not cost effective for the Utility at this time.
- Climate Action Plan: CED has begun the development of the cities Climate Action Plan (CAP) to assist in reducing Greenhouse Gas Emissions.
- Water Efficiency Rebates: CED is working closely with the Water Department in the development of water efficient rebates in support of the water energy nexus.

CITY OF COLTON – FY 2014/2015 ENERGY EFFICIENCY RESULTS

Colton		Resource Savings Summary									Cost Summary			
Program Sector (Used in CEC Report)	Category	Units Installed	Gross Coincident Peak Savings (kW)	Gross Annual Energy Savings (kWh)	Gross Lifecycle Energy Savings (kWh)	Net Coincident Peak Savings (kW)	Net Annual Energy Savings (kWh)	Net Lifecycle Energy Savings (kWh)	Net Lifecycle Gas Savings (MMBtu)	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)	Utility ($/kWh)
Appliances	Res Clothes Washers	15	2	2,475	37,125	1	767	11,509		7	$16,875	$31	$16,906	$2.05
HVAC	Res Cooling	39	1	16,786	179,280	1	13,462	143,457		93	$65,249	$792	$66,041	$0.59
Appliances	Res Dishwashers	10	1	900	13,500		540	8,100		5	$7,500	$20	$7,520	$1.30
Consumer Electronics	Res Electronics													
HVAC	Res Heating													
Lighting	Res Lighting	1	57	101,797	1,017,970	57	101,797	1,017,970		577	$33,438	$2,388	$35,826	$0.04
Pool Pump	Res Pool Pump	11		18,821	188,210		11,293	112,926		67	$24,200	$331	$24,531	$0.27
Refrigeration	Res Refrigeration	180	9	20,741	259,240	6	14,519	181,468		102	$579,229	$447	$579,676	$4.28
HVAC	Res Shell	92	6	9,400	185,801	2	2,673	84,856		53	$13,614	$336	$13,951	$0.24
Water Heating	Res Water Heating	1		156	2,340		94	1,404		1	$100	$3	$103	$0.10
Comprehensive	Res Comprehensive	1	205	1,279,607	1,279,607	205	1,279,607	1,279,607		762		$3,394	$3,394	
Process	Non-Res Cooking													
HVAC	Non-Res Cooling	32	20	284,943	3,473,705	20	284,943	3,473,705		2,200	$34,527	$11,867	$46,393	$0.02
HVAC	Non-Res Heating													
Lighting	Non-Res Lighting	508	136	284,745	11,565,410	136	284,745	11,565,410		6,850	$74,114	$29,865	$103,979	$0.01
Process	Non-Res Motors	2	683	6,004,137	60,981,615	683	6,004,137	60,981,615		33,986	$150,000	$144,783	$294,783	$0.01
Process	Non-Res Pumps	1	10	89,719	897,190	10	89,719	897,190		500	$6,729	$2,132	$8,861	$0.01
Refrigeration	Non-Res Refrigeration	40	1	6,360	63,600	1	6,360	63,600		35	$1,000	$151	$1,151	$0.02
HVAC	Non-Res Shell													
Process	Non-Res Process													
Comprehensive	Non-Res Comprehensive	1	5	39,659	396,594	5	39,659	396,594		241	$25,000	$1,288	$26,288	$0.08
Other	Other													
SubTotal		934	1,134	8,160,247	80,541,187	1,126	8,134,315	80,219,411		45,479	$1,031,574	$197,829	$1,229,403	$0.02
T&D	T&D													
Total		934	1,134	8,160,247	80,541,187	1,126	8,134,315	80,219,411		45,479	$1,031,574	$197,829	$1,229,403	

EE Program Portfolio	TRC Test	**2.28**
	PAC Test	**6.93**

Excluding T&D

CORONA DEPARTMENT OF WATER AND POWER (DWP)

Corona At a Glance

- Electric utility began serving retail customers in 2001 with unbundled generation services to existing investor-owned utility customers and bundled service to new facilities located in the designated service territory.
- DWP provides electric service to approximately 2,200 customers in climate zone 10.
- Peak demand for the utility was 27.1 megawatts (1.6% more than last year) and annual energy sales were 146,400 megawatt-hours (0.5% more than last year).
- Ninety-seven percent of energy sales were to non-residential customers.

Corona Utility Overview

All bundled customers' facilities are less than 11 years old and met the 2003 or 2008 Title 24 requirements. These newer facilities provide less energy efficiency upgrade opportunities.

Program Highlights

- $115,210 was expended to complete 37 on-site energy audits that identify specific opportunities to improve energy operating efficiency and reduce load requirements.
- 230 rebates were provided for the purchase and installation of Energy Star® washing machines to reduce electric and water customer usage. $11,500 was contributed by DWP and $19,950 was contributed by Metropolitan Water District of Southern California.
- DWP serves municipal facilities that can be interrupted as scheduled.

Program Descriptions

- Energy Audits: On-site energy audits and recommendations designed to improve energy operating efficiency and reduce load requirements. Rebates are available for energy efficiency upgrades identified in these audits. Verification services to ensure appropriate installation of recommended measures are also provided.
- Energy Efficiency Technical Support: Technical support to facilitate installation and operation of air conditioning and lighting controls.
- Energy Usage and Demand Analysis: Analyze commercial customer energy usage and demand to facilitate customer efficiency measures and demand-side management.
- Energy Efficiency Kits: Energy efficiency kits for all residential customers that include a refrigerator thermometer, two 15 watt CFL bulbs, draft stoppers, air filter whistle, low flow showerhead, low flow faucet aerators, toilet dye tabs, and energy conservation tips.
- Appliances: Rebates are provided to customers who purchase and install Energy Star® washing machines.
- Lighting Incentives: Provides incentives to improve energy efficiency for a variety of lighting applications, which reduce energy usage by a specified amount.

- Custom Energy Efficiency Incentives: Offers financial incentives for cost-effective energy-savings opportunities, not served by existing offerings, (including HVAC, motors, pumps, refrigeration, process and other) which reduce energy usage or load requirements by a specified amount.
- Utility-Side Projects/Activities: Direct funding for projects/activities on the utility-side of the meter that promote customers benefits in terms of improved safety, system integrity, energy efficiency, conservation, or research and development.

EM&V

Engineering analysis programs are the basis for energy savings and incentive calculations.

Complimentary Public Benefit Programs:

Renewable Energy Programs:

- Solar Initiative Program: The Solar Incentive Program provides financial incentives to qualifying customers to reduce the cost of renewable energy generation. The 2015 rebate incentive is equal to the estimated performance of the installed solar system multiplied by $0.78/watt AC.
- Net Metering Program: A net metering tariff schedule is available to qualifying customers.
- DWP Solar Installations: DWP has installed 350 kW of photovoltaic systems.

CORONA DEPARTMENT OF WATER & POWER – FY 2014/2015 ENERGY EFFICIENCY RESULTS

Corona		Resource Savings Summary									Cost Summary			
Program Sector (Used in CEC Report)	Category	Units Installed	Gross Coincident Peak Savings (kW)	Gross Annual Energy Savings (kWh)	Gross Lifecycle Energy Savings (kWh)	Net Coincident Peak Savings (kW)	Net Annual Energy Savings (kWh)	Net Lifecycle Energy Savings (kWh)	Net Lifecycle Gas Savings (MMBtu)	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)	Utility ($/kWh)
Appliances	Res Clothes Washers	230		65,320	718,520		20,249	222,741		133	$11,500		$11,500	$0.07
HVAC	Res Cooling													
Appliances	Res Dishwashers													
Consumer Electronics	Res Electronics													
HVAC	Res Heating													
Lighting	Res Lighting													
Pool Pump	Res Pool Pump													
Refrigeration	Res Refrigeration													
HVAC	Res Shell													
Water Heating	Res Water Heating													
Comprehensive	Res Comprehensive													
Process	Non-Res Cooking													
HVAC	Non-Res Cooling													
HVAC	Non-Res Heating													
Lighting	Non-Res Lighting													
Process	Non-Res Motors													
Process	Non-Res Pumps													
Refrigeration	Non-Res Refrigeration													
HVAC	Non-Res Shell													
Process	Non-Res Process													
Comprehensive	Non-Res Comprehensive													
Other	Other	37		1,850	5,550		1,850	5,550		3	$115,210		$115,210	$22.65
SubTotal		267		67,170	724,070		22,099	228,291		136	$126,710		$126,710	$0.71
T&D	T&D													
Total		267		67,170	724,070		22,099	228,291		136	$126,710		$126,710	

EE Program Portfolio	TRC Test	**1.40**
	PAC Test	**0.22**

Excluding T&D

Glendale Water & Power At a Glance

- Established in 1909
- Climate Zone 9
- 86,782 electric meters and 33,976 water meters.
- Total retail sale of electricity for FY 2014-15 of 1,080,077 MWh
- Retail sales (MWh) by customer class – Residential (34.48%), Commercial (31.24%), Industrial (33.49%), Street lighting (.79%)
- Budgeted amount for energy efficiency programs: $1,509,000 , amount actually expended: $1,434,948 and funding source: Electric Revenue. The unused budget is maintained in a fund balance to be applied towards qualifying projects, programs and services.

Utility Overview

With the installation of digital meters, Glendale Water & Power (GWP) can develop new innovative energy efficiency, load management, and demand response programs for its customers. Our customers are eager to take advantage of the many benefits and new programs a modernized utility system offers. Trends in utilities are leading towards digital communications, need for real time and near real time usage information that will help consumers take charge of their energy use and give them the tools to manage it.

A modernized electric grid greatly expand data acquisition and data sharing across business units, lowering system losses, preventing energy theft and dramatically improving outage and asset management, reducing maintenance and capital costs with the goal of keeping downward pressure on consumer prices. For the current FY 2014-15 reporting year, GWP's energy efficiency programs saved 17,380 MWh (1.61% of retail sales) and reduced peak demand by 4.57 MW (1.36% of peak demand). With a modernized utility system, GWP will offer more programs and increase customer engagement through mobile applications to enable our customers to be stewards in conservation by giving them the tools to empower them.

Major Program Changes

In FY 2014-2015 we implemented three pilot programs. The Behavioral Demand Response pilot program, Mobile My Connect App and the Conservation Voltage Reduction program which all contributed to an increase in our annual energy savings. Resident's engagement increase with the Home Energy Report has also contributed to our increase in energy savings.

Program Highlights

Our Home Energy Reports from OPOWER and our Large Business Energy Solutions program produced the most energy savings from our portfolio. The Home Energy Reports had the greatest impact on our residential customers, we are currently among the top reporting energy efficiency utilities from OPOWER's portfolio. This program also reached the majority of our customers and provides constant communication and engagement. Our Business Energy Solutions program is a CMUA award winning program that is

designed to allow GWP large business customers the flexibility to define their own needs and develop their own energy efficiency projects.

Program Descriptions

Glendale Water & Power is a leader in many aspects of the utility industry. Along with aggressive conservation efforts, GWP has been giving back to the Community through its Public Benefit Programs. These programs not only assist low-income customers with their electric bills, they also provide funding and education for all customers to invest in new technologies helping them save money and lower their energy and water consumption.

Residential Customer Programs

- OPOWER Home Energy Reports - Provides six print paper reports annually to 50,000 residential customers on their energy use. Reports also include action steps for each household to help them reduce their electricity consumption. Currently, the program is integrating the existing two month billing data and a wealth of external data sources to educate customers on how they can save energy. With the installation of digital meters throughout Glendale's service territory, customers are mailed a home energy report that includes their Smart Grid data and access to the website where they can review their energy usage. (Res Comprehensive)
- OPOWER Web Portal - Provides customers with web-access to electric usage information from their digital meters. The software analytics engine enables the coupling of insightful messaging with specific, targeted action steps for each household to help the customer reduce their electricity consumption. The addition of interval electric usage data has given customers the ability to view their usage in monthly, weekly, daily or hourly intervals. Access to granular information coupled with the analytic engine will provide customers with greater insight into their usage and provide more in-depth ways for them to save energy and money.
- Behavioral Demand Response Pilot Program - GWP partnered with Opower to design a residential Behavioral Demand Response (BDR) program which leveraged AMI data analytics, behavioral science, and multi-channel communications to give customers personalized insights on how to best trim their electricity use during peak events. This program targeted 40,000 utility residential customers to receive electronic, IVR, and paper communication using a behavioral science approach. The communications encourages customers to adjust their energy consumption during periods of peak energy demand. BDR is an innovative approach to residential demand response because it gives customers personalized feedback on their performance shortly after a peak event is complete. Customers no longer have to wait until their monthly bill to see how much they saved and this is paramount to locking in positive peak shaving behaviors for future events. (Res Cooling)
- Smart Home Energy and Water Savings Rebates - Provides incentives to promote the purchase of approved energy and water saving appliances and devices. Customers accessed an online platform that allowed them to apply for a rebate online. (Res Shell, Res Cooling, Res Dishwasher, Res Pool Pump, Res Refrigerator, Res Clothes Washers)

- Smart Home AC Tune-Ups - Provided by Proctor Engineering, helps residential customers save energy by ensuring that their air conditioning and duct systems are functioning at their optimal level. (Res Shell)
- Livingwise® - Provides energy and water conservation education materials for Glendale public and private school students. These materials support 10 hours of intensive energy education as well as in-home installation of energy saving devices including compact florescent light bulbs. (Res Comprehensive, Res Lighting)
- Tree Power - Provides up to three free shade trees and arborist services to ensure that the trees are planted correctly. When properly sited and cared for, a healthy, mature shade tree helps provide shade that cools the home and helps reduce air conditioning use. (Res Cooling)
- Conservation Voltage Reduction (CVR) - GWP partnered with Dominion Voltage, Inc. to provide their EDGE solution, a conservation voltage reduction (CVR) program, as a pilot. CVR conserves electricity by operating electric customer voltages in the lower half of the ten percent (10%) voltage band required by equipment standards. (Res Cooling)
- Mobile My Connect - GWP is piloting its first free mobile application through its Smart Customer Mobile engagement program which offers residential customers a new and interactive app to better manage their energy and water usage on a smart phone, tablet and web anytime and anywhere. The user-friendly portal platform, provided by Smart Utility Systems (SUS), delivers real-time usage information and two-way communication between the customer and GWP. The new mobile app, called GWP – Mobile My Connect, and features the GWP logo, will allow residential customers to view current and historical bills as well as pay bills, set budget goals, submit service requests, view/report outages, send messages directly to GWP and obtain electric vehicle or solar panel usage information.

Commercial Customer Programs

- Smart Business Energy Saving Upgrades - CMUA award winning program that provides small business customers with comprehensive no-cost energy surveys, customized written reports, energy education, and directly installs as much as $2,000 worth of cost-effective energy conservation measures. (Non-Res Comprehensive, Non-Res Lighting)
- Smart Business AC Tune-Ups - Provided by Proctor Engineering, helps small business customers save energy by ensuring that their air conditioning and duct systems are functioning at their optimal level. (Non-Res Shell)
- Business Energy Solutions (BES) - CMUA award winning program that provides incentives for medium and large businesses to complete pre-approved energy saving retrofit projects. Incentives are limited to the lesser of 20% total project costs for retrofit projects, 100 percent of the above Title 24 remodeling and/or new construction investments, or $0.06 per kWh saved over the life of the installed measures. (Non-Res Lighting, Non-Res Cooling, Non-Res Motors)

New Programs – FY 2015-2016

- CEIVA/Thermostat Program - GWP partnered with CEIVA Energy, LLC to provide a unique In-Home Display (IHD) solution for residential customers. The CEIVA IHD is a digital picture frame

that integrates customer's personal photographs with meaningful and useful historical water usage information and near real time electric consumption information. The CEIVA IHD works as a home gateway that simultaneously communicates with GWP's electric digital meters as well as the customer's existing home networks via Wi–Fi or Ethernet. In addition to providing interval energy and water consumption usage information, GWP has the ability to enhance outreach, by pushing energy efficiency program, conservation and event messages directly to the IHD. In FY 2014-15 GWP's pilot consisted of 72 IHD's with a broad cross section of residential customers. GWP will be expanding our current pilot with CEIVA from 72 to 1,000 customers in FY 2015-16, and add integrated smart thermostats, and remote provisioning/web portal software.

- Meter Data Analytics - GWP is working with Detectent, Inc. to provide a Meter Data Analytics Program solution. GWP believes that between 2% and 4% of its current energy losses are non-technical in nature, and can be mitigated through an effective Meter Data Analytics Program. This program will provide GWP with the ability to integrate the large amounts of customer related data it is now receiving from various intelligent devices it has installed in the field to enhance customer program efficiencies and reduce costs.
- Unusual Usage Alerts - GWP and Opower are partnering to launch Unusual Usage Alerts (UUAs) to all GWP customers that sign up for the service. UUAs are designed to analyze and consume AMI data to help customers save energy and money when they are likely to consume more energy than usual for a billing period. Before the end of a billing period, UUAs inform customers that they are likely to have high energy use, and they provide insights to help customers reduce their consumption before the billing period ends.
- Small and Medium Business Analytics - The business website portal and mobile platform will seek to engage small to medium-sized business customers over a mobile platform that provides comprehensive energy management information designed to provide insight and business customer interaction related to energy and water usage, energy efficiency and conservation, and device/appliance management for continuous improvement on energy management and energy decisions.

EM&V

Glendale Water & Power plans to initiate EM&V analysis of energy efficient programs in FY 2015-16 in support of AB2021. For FY 2015-16 Glendale has budgeted $50,000 to its energy efficiency budget to conduct EM&V studies that will be conducted through the use of a third-party contractor. GWP will select energy efficiency programs based on the kWh savings. The purpose of the EM&V study is to ensure that measures are installed as claimed by GWP and to lend credibility to GWP's savings reports as compared to the industry standards that were available at the time of GWP's program processing and implementation. It is Glendale's plan to review all energy efficiency programs in terms of cost effectiveness, customer participation and administration.

Glendale Water & Power consistently performs the following in support of EM&V activities:

- A pre-and post-inspection of 100% of all large commercial retrofit projects under the Business Energy Solutions program, including a review of their energy-saving calculations.
- All residential and commercial solar PV installations are field inspected and verified by city personnel for program compliance.
- Audits and installations performed by third-party contractors for Glendale's direct install Smart Business Energy Saving Upgrades program have high inspection rates that are performed by the consultant.

Sources of Energy Savings

The sources of energy savings used to calculate program performance was a combination of using the TRM, work papers and third party EE verifications.

Complimentary Public Benefits Programs

Renewable Energy Programs: These programs provide incentives to install solar photovoltaic systems in Glendale. Funding supported by Public Benefit Funds and distributed between residential, small business and large business customers.

- Smart Home Solar Solutions - This program provides incentives to promote the installation of grid-connected solar photovoltaic systems in Glendale. A total of .58 MW in new grid-connected residential solar photovoltaic installations in FY 2014-15.
- Business Solar Solutions - This program provides incentives to promote the installation of grid-connected solar photovoltaic systems on small businesses in Glendale. A total of .067 MW in new grid-connected small business solar photovoltaic installations in FY 2014-15.
- Large Business Solar Solutions - This program provides incentives to promote the installation of grid-connected solar photovoltaic systems on large businesses in Glendale. An existing total of .55 MW in grid-connected large business solar photovoltaic installations that generate a total of 961 MWh in FY 2014-15.

Low-Income Programs:

- Senior Care - This program provides electric bill discounts for low-income seniors and disabled customers 55 and older. Senior Care was closed to new participants in 2009 when Glendale Care was implemented.
- Glendale Care - This program offers all eligible low-income customers a discount of $13 on their electric bills.
- Guardian - This program provides bill discounts for households with special electrically powered medical equipment needs.
- Helping Hand - This program provides bill payment and deposit assistance for low-income customers.

Research, Development, and Demonstration:

- Codes & Standards - GWP has included our respective share of the energy savings that are attributable to the State's Building Codes and Appliance Standards that are applied and enforced by the City of Glendale.

GLENDALE WATER & POWER – FY 2014/2015 ENERGY EFFICIENCY RESULTS

Glendale		Resource Savings Summary									Cost Summary			
Program Sector (Used in CEC Report)	Category	Units Installed	Gross Coincident Peak Savings (kW)	Gross Annual Energy Savings (kWh)	Gross Lifecycle Energy Savings (kWh)	Net Coincident Peak Savings (kW)	Net Annual Energy Savings (kWh)	Net Lifecycle Energy Savings (kWh)	Net Lifecycle Gas Savings (MMBtu)	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)	Utility ($/kWh)
Appliances	Res Clothes Washers	427		36,794	404,734		11,406	125,468		75	$33,964	$217	$34,181	$0.35
HVAC	Res Cooling	449	2,486	713,604	2,014,994	2,474	620,486	1,661,598		1,072	$98,662	$5,164	$103,826	$0.09
Appliances	Res Dishwashers	207		6,694	66,940		4,016	40,164		24	$9,390	$66	$9,455	$0.30
Consumer Electronics	Res Electronics													
HVAC	Res Heating													
Lighting	Res Lighting	1,481		239,641	2,396,406		239,641	2,396,406		1,359	$61,136	$3,602	$64,737	$0.03
Pool Pump	Res Pool Pump	60	2	40,440	404,400	1	24,264	242,640		145	$7,312	$454	$7,766	$0.04
Refrigeration	Res Refrigeration	400		52,000	728,000		39,000	546,000		308	$32,120	$856	$32,976	$0.08
HVAC	Res Shell	908	308	204,074	2,415,103	291	181,312	2,015,366		1,200	$74,369	$3,464	$77,834	$0.05
Water Heating	Res Water Heating													
Comprehensive	Res Comprehensive	1,482	121	7,807,759	8,936,281	121	7,807,759	8,936,281		5,320	$559,000	$15,106	$574,106	$0.07
Process	Non-Res Cooking													
HVAC	Non-Res Cooling	6	194	782,562	8,755,620	194	782,562	8,755,620		5,601	$25,828	$20,418	$46,245	$0.01
HVAC	Non-Res Heating													
Lighting	Non-Res Lighting	218	564	3,191,617	34,524,483	564	3,191,617	34,524,483		20,448	$448,706	$61,941	$510,647	$0.02
Process	Non-Res Motors	2	101	201,265	3,018,975	101	201,265	3,018,975		1,683	$12,836	$4,497	$17,333	$0.01
Process	Non-Res Pumps													
Refrigeration	Non-Res Refrigeration													
HVAC	Non-Res Shell	193	722	4,117,126	4,683,910	722	4,117,126	4,683,910		2,845	$9,876	$9,417	$19,294	
Process	Non-Res Process													
Comprehensive	Non-Res Comprehensive	157	99	159,669	479,007	99	159,669	479,007		291	$31,599	$985	$32,585	$0.07
Other	Other													
SubTotal		5,990	4,596	17,553,245	68,828,853	4,567	17,380,124	67,425,917		40,370	$1,404,797	$126,188	$1,530,985	$0.03
T&D	T&D													
Total		5,990	4,596	17,553,245	68,828,853	4,567	17,380,124	67,425,917		40,370	$1,404,797	$126,188	$1,530,985	

EE Program Portfolio	TRC Test	**2.90**
	PAC Test	**5.53**

Excluding T&D

GRIDLEY MUNICIPAL UTILITIES

Gridley Municipal Utilities (GMU) At a Glance

- Year Established: 1910
- Climate Zone: 11
- Number of Retail Customers Served: 2876
- Percent of Retail Sales by Customer Class: 32% Residential, 68% Commercial/Industrial
- Energy Efficiency Program Budget: $110,000; Energy Efficiency Program Expenditures: $91,003 The balance of the budgeted funds were used to cover internal administrative expenses at GMU.
- Load Growth: 4%

Gridley Municipal Utilities Overview

GMU feels a significant responsibility to its community/ratepayers to invest their Public Benefits funds in such a way as to impact both energy savings and financial savings/positive economics in Gridley. GMU offers a comprehensive menu of rebates to all of our customers. However, because of the economic downturn that has affected the City for several years, the number of customers taking advantage of the rebate offers have been relatively low.

To compensate for this, GMU has offered direct install programs that provide energy efficiency measures to customers at no cost to them. In FY15, GMU offered a Residential Direct Install program that provided screw-in based LEDs and advanced smart power strips to customers at no charge. This is a very popular program, and the benefits have been helpful and appreciated by Gridley citizens.

There was one commercial lighting project, and a relatively small number of residential customers participated in the appliance, HVAC and weatherization rebate programs.

Major Program Changes

There were no major program changes in FY15. GMU focused our program efforts on the residential customer segment in FY15 as opposed to the commercial customer segment in FY14.

Program Highlight

The Residential Direct Install Program delivered the greatest percentage of savings in FY15, accounting for 73% of the total savings. A large commercial lighting project accounted for 21% of the total savings. In addition to rebate programs, GMU responds to customer inquiries and provides site visits to help customers identify energy saving opportunities and manage their energy use.

The net annual kWh savings of 98,321 in FY15 represents 58% of GMU's AB2021 goal 170,000 kWhs.

Looking forward to FY16, GMU has increased the incentives on many of its measures in order to encourage greater participation in the EE programs. In addition, GMU will be increasing the marketing of

its EE programs to our customers to increase their awareness of EE programs. GMU will plans to continue offering the popular direct install programs to commercial and residential customers.

GMU manages a comprehensive energy efficiency incentive program for residential & commercial customers focusing on peak load reduction and energy conservation. For residential customers, rebates are offered for the installation of various energy efficiency measures. For commercial customers, rebates are available for upgraded lighting, refrigeration equipment and in cases where an analysis is performed rebates can be offered for additional equipment that reduces energy use and/or demand.

- Residential Audit Program [Res Comprehensive]: On-site energy audits are provided by GMU energy specialists. Energy efficiency measures are recommended and additional visits are completed upon request.
- Residential Lighting Program [Res Lighting]: GMU offers rebates to homeowners who install ENERGY STAR® qualified LED lamps/bulbs, ceiling fans and LED holiday lights.
- Residential Cooling Program [Res Cooling]: GMU offers rebates to homeowners who install high performance heat pumps, central air-conditioners, or evaporative coolers that exceed current state requirements. GMU also offers a rebate for regular maintenance of cooling equipment (tune-ups every 3 years).
- Residential Equipment Program [Res Clothes Washers; Res Cooling; Res Dishwashers; Res Pool Pump; Res Refrigeration]: GMU offers rebates to homeowners who purchase new ENERGY STAR qualified products, including clothes washers, room air conditioners, dishwashers, pool pumps, refrigerators and freezers.
- Residential Weatherization Program [Res Shell]: GMU offers rebates to homeowners who invest in weatherizing their homes, including attic/wall/duct insulation, window treatments/replacement, air/duct sealing and radiant barriers.
- Residential Water Heater Rebate Program [Res Water Heating]: GMU offers rebates to homeowners who purchase a new, energy efficient electric water heater.
- Residential Direct Install Program [Res Comprehensive; Res Lighting]: Audits are performed on residential homes and advanced smart power strips and ENERGY STAR rated LEDs are installed at no cost to the homeowner.
- Commercial Audit Program [Non-Res Comprehensive]: On-site energy audits are provided by GMU energy specialists. Energy efficiency measures are recommended and additional visits are completed in order to provide technical assistance for implementation of measures. Energy efficiency rebates are available for upgrades identified during these audits.
- Commercial Lighting Program [Non-Res Lighting]: GMU offers rebates to business owners who invest in the installation of energy efficiency lighting upgrades. There is a prevalence of T-12 lighting throughout the city and most high bay lighting uses high intensity discharge fixtures instead of more efficiency fluorescent or LED fixtures.

- Commercial Custom Program [Non-Res Comprehensive]: GMU offers rebates to business owners based on site-specific consumption. Rebates are tailored to the individual business owner's needs based on the audit and the potential energy savings associated with the customer project.

EM&V

GMU's last EM&V report was performed on work completed between July 1, 2008 and June 30, 2009. GMU has budgeted $5,000 in FY2016 for evaluation of work completed between July 1, 2009 and June 30, 2012. GMU is currently exploring the opportunity of partnering with Shasta Lake Utilities and City of Ukiah on this EM&V effort in order to gain economies of scale.

Sources of Energy Savings

For FY15, GMU has revised the savings estimates based on the Technical Resource Manual.

GRIDLEY MUNICIPAL UTILITIES – FY 2014/2015 ENERGY EFFICIENCY RESULTS

Gridley		Resource Savings Summary									Cost Summary			
Program Sector (Used in CEC Report)	Category	Units Installed	Gross Coincident Peak Savings (kW)	Gross Annual Energy Savings (kWh)	Gross Lifecycle Energy Savings (kWh)	Net Coincident Peak Savings (kW)	Net Annual Energy Savings (kWh)	Net Lifecycle Energy Savings (kWh)	Net Lifecycle Gas Savings (MMBtu)	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)	Utility ($/kWh)
Appliances	Res Clothes Washers	1		284	3,124		88	968			$100	$4,045	$4,145	$5.52
HVAC	Res Cooling	375	1	1,478	28,650	1	833	15,942		10	$848	$21,859	$22,707	$2.17
Appliances	Res Dishwashers													
Consumer Electronics	Res Electronics	138	3	51,336	256,680	2	41,069	205,344		126	$10,350	$1,578	$11,928	$0.07
HVAC	Res Heating													
Lighting	Res Lighting	1,430	13	48,278	619,170	11	28,800	348,002		175	$15,753	$5,426	$21,178	$0.08
Pool Pump	Res Pool Pump													
Refrigeration	Res Refrigeration	1		130	1,820		91	1,274		1	$100	$7,164	$7,264	$7.81
HVAC	Res Shell													
Water Heating	Res Water Heating													
Comprehensive	Res Comprehensive													
Process	Non-Res Cooking													
HVAC	Non-Res Cooling	20	3	4,960	74,400	2	4,216	63,240		39	$7,500	$2,571	$10,071	$0.22
HVAC	Non-Res Heating													
Lighting	Non-Res Lighting	1	4	28,450	341,400	3	22,760	273,120		151	$7,112	$6,289	$13,401	$0.06
Process	Non-Res Motors													
Process	Non-Res Pumps													
Refrigeration	Non-Res Refrigeration	1		773	9,276		464	5,566		3	$200	$109	$309	$0.07
HVAC	Non-Res Shell													
Process	Non-Res Process													
Comprehensive	Non-Res Comprehensive													
Other	Other													
SubTotal		1,967	24	135,689	1,334,520	19	98,321	913,456		504	$41,963	$49,040	$91,003	$0.13
T&D	T&D													
Total		1,967	24	135,689	1,334,520	19	98,321	913,456		504	$41,963	$49,040	$91,003	

EE Program Portfolio	TRC Test	**1.04**
	PAC Test	**1.33**

Excluding T&D

HEALDSBURG ELECTRIC DEPARTMENT

Healdsburg Electric Department at a Glance

- Healdsburg's Electric Department was established in 1899.
- Healdsburg is located in Climate Zone 2.
- Healdsburg serves roughly 4,735 residential customers, 968 commercial services, and 50 industrial services.
- Percent of retail kilowatt-hour sales by customer class are 35% residential, 55% commercial, and 10% industrial.
- Fiscal Year 2015-budgeted amount for Energy Efficiency Rebates was $240,000, actual rebates paid in FY2015 was $150,988. Unspent moneys are allocated to low income discounts and solar rebates.
- Average load growth in Healdsburg is less than 1%.

Healdsburg Electric Department Overview

Healdsburg's Electric Department manages a comprehensive energy efficiency program for residential and commercial customers focusing on energy conservation as well as peak load reduction. For residential customers, rebates incentivize the installation of a variety of energy efficiency measures. For commercial customers, rebates are available for upgrading lighting, refrigeration, HVAC, and custom programs where detailed analysis shows a benefit to cost ratio consistent with the Electric Department's existing programs.

Major Program Changes

The City of Healdsburg continues to focus on streamlining residential and commercial programs. The City is now able to offer online submission of residential rebate forms, which has significantly shortened rebate processing time. In addition, the City brought the commercial rebate program back in-house to allow for a more tailored program and customer service experience.

The heightened focus on water conservation in California because of Governor Jerry Brown's Executive Order and the State Water Resources Control Board's Emergency Regulation required staff to significantly redirect time and attention from electric to water programs. A benefit of this shift is that it allowed the City of Healdsburg to expand on existing residential and commercial programs to offer a more comprehensive consumption analysis to our customers and assist in reducing both water and energy usage.

The City of Healdsburg signed a contract with Smart Utility Systems in 2015 to implement a customer analytics tool that will provide usage analysis, efficiency suggestions, and reporting tools. The City expects to launch this tool in spring of 2016.

Program Highlight

The City's commercial energy efficiency program continues to be our most successful program. Calendar year 2015 saw rebates for new and different technologies, especially in the wine processing industry. The

City will continue to focus on developing commercial projects, especially with our wine industry customers, as there are large potentials for energy efficiency projects in these applications. The City of Healdsburg's commercial energy efficiency program is completely customizable, based on the customer's need and proposed project, and offers an incentive per kilowatt-hour as well as an adder ("kicker") for peak demand reduction. The incentive for demand reduction provides higher value to projects that reduce system peak demands. This, as well as the residential programs lead to 560,209 kWh saved; roughly 1% of Healdsburg annual sales.

Program Descriptions

For residential customers the City offers the following programs:

- Energy Efficiency Hotline: The City's electrical customers can call the City's Utility Conservation Analyst to answer questions and provide information on energy efficiency related matters.
- Free Energy Audits: On-site energy audits are available to residential customers. Energy efficiency measures are recommended based on each audit and upon request, the customer is provided a written report summarizing findings and recommendations to reduce the customer's monthly energy consumption.
- Appliance Rebates: The City provides rebates for the purchase of several ENERGY STAR® rated appliances.
- Residential Heat Pump and Efficient Air Conditioning Rebates: The City offers rebates for residential and small business customers who install high performance heat pumps, central air-conditioners or evaporative coolers that exceed current state requirements.
- Residential Lighting Rebates: The City offers rebates to homeowners who install ENERGY STAR® qualified LED lamps and LED string lights.
- Residential Electric Water Heater: The City offers customers a rebate toward the installation of new, energy efficient electric water heaters.
- Weatherization/Window Incentives: The City provides financial incentives for homeowners who invest in home weatherization and window replacement projects.

For commercial customers the City provides the following programs:

- Energy Audits and Rebates: This program offers complementary, on-site energy audits for both commercial and industrial customers. Energy efficiency recommendations and follow up visits support implementation of recommended energy efficiency measures. Energy efficiency rebates are available for upgrades identified through these audits.
- Commercial Lighting: This program engages local lighting and electrical contractors to promote and install energy efficient lighting upgrades through technical assistance and financial incentives available from Healdsburg's Electric Department.
- Commercial Refrigeration and HVAC: The City offers commercial customers a wide selection of refrigeration and HVAC rebates. These rebates are performance based and provided greater reward to projects that reduce system peak demand.

- Custom Energy Efficiency Programs: The Healdsburg Electric Department will consider custom energy efficiency programs for site-specific consumption. The Electric Department will require that the City's contractor review and endorse all custom programs. This review may result in a small cost adder to the proposed project but validates the benefit to cost ratio of the program. The Healdsburg Electric Department retains the sole right to approve or deny custom projects.

EM&V

Past EM&V reports can be found through the following link; http://www.ncpa.com/current-issues/energy-efficiency-reports.html. The City plans to complete additional EM&V reports in calendar year 2016.

Sources of Energy Savings

The City of Healdsburg relies on TRM data to calculate energy savings.

Complimentary Programs

- Renewable Energy Programs: The City of Healdsburg still continued to provide incentives for solar installations through 2015 but ended the rebate portion of the program in early 2016. The City's current Net Energy Metering program will continue as designed, minus the rebate, for all customers interested in pursuing solar installations. As a lower cost alternative, the City provides a "Green Rate" for customers choosing to fully cover their energy use from non-carbon sources.
- Low-Income Programs: The City of Healdsburg actively supports a low-income discount for low-income customers. Annually this discount supports over 270 customers or nearly 6% of the City's residential customers.
- Research, Development, and Demonstration: In 2015, the City of Healdsburg worked to implement energy savings rebates and programs for vineyard and winery customers to help achieve large reduction in energy usage and demand. The City will continue to work on development and further implementation of this program.
- Electric Vehicles: In 2015, the City of Healdsburg purchased a plug-in hybrid Chevy Volt for use by Electric Department staff. This is the first plug-in vehicle for the City. In addition, four new vehicle charging stations were installed in 2015. These stations, plus the two existing charging stations installed in 2013, have supplied 48 MWh of energy and saved more than 20,200 kg of GHG. The City plans to install four new electric vehicle charging stations in 2016 as well as continue to grow our electric vehicle fleet.

HEALDSBURG ELECTRIC DEPARTMENT – FY 2014/2015 ENERGY EFFICIENCY RESULTS

Healdsburg		Resource Savings Summary									Cost Summary			
Program Sector (Used in CEC Report)	Category	Units Installed	Gross Coincident Peak Savings (kW)	Gross Annual Energy Savings (kWh)	Gross Lifecycle Energy Savings (kWh)	Net Coincident Peak Savings (kW)	Net Annual Energy Savings (kWh)	Net Lifecycle Energy Savings (kWh)	Net Lifecycle Gas Savings (MMBtu)	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)	Utility ($/kWh)
Appliances	Res Clothes Washers	12		4,380	48,180		1,358	14,936		8	$900	$1,745	$2,645	$0.23
HVAC	Res Cooling	39		1,487	22,305		1,190	17,844		11	$4,070	$3,034	$7,104	$0.56
Appliances	Res Dishwashers	9		522	5,220		313	3,132		2	$540	$366	$906	$0.37
Consumer Electronics	Res Electronics													
HVAC	Res Heating													
Lighting	Res Lighting	1,246	6	25,009	366,665	3	13,505	197,999		100	$5,384	$7,586	$12,970	$0.09
Pool Pump	Res Pool Pump	7	3	11,977	87,453	2	7,186	52,472		26	$875	$1,770	$2,645	$0.06
Refrigeration	Res Refrigeration	28		3,596	50,344		2,517	35,241		19	$2,100	$5,475	$7,575	$0.29
HVAC	Res Shell	4,861	1	4,889	85,900		1,369	24,052		14	$4,445	$3,034	$7,480	$0.46
Water Heating	Res Water Heating	2		2,068	20,680		1,241	12,408		7	$200	$506	$706	$0.07
Comprehensive	Res Comprehensive													
Process	Non-Res Cooking													
HVAC	Non-Res Cooling													
HVAC	Non-Res Heating													
Lighting	Non-Res Lighting	17	43	448,281	6,724,215	37	381,039	5,715,583		3,167	$188,755	$57,766	$246,521	$0.06
Process	Non-Res Motors													
Process	Non-Res Pumps													
Refrigeration	Non-Res Refrigeration	1		58,000	870,000		49,300	739,500		390	$13,920	$6,386	$20,306	$0.04
HVAC	Non-Res Shell													
Process	Non-Res Process													
Comprehensive	Non-Res Comprehensive													
Other	Other													
SubTotal		6,222	53	560,209	8,280,962	42	459,017	6,813,166		3,743	$221,189	$87,669	$308,858	$0.06
T&D	T&D													
Total		6,222	53	560,209	8,280,962	42	459,017	6,813,166		3,743	$221,189	$87,669	$308,858	

EE Program Portfolio	TRC Test	**1.46**
	PAC Test	**2.46**

Excluding T&D

IMPERIAL IRRIGATION DISTRICT

Imperial Irrigation District At a Glance

- Established in 1936 (Power Industry)
- Climate Zone 15
- 152,725 customer connections
- Percent of retail sales by customer class – residential: 52.66%, commercial: 44.5% , industrial: .75%, agriculture: 2.09%
- Total budget: $6,130,000 for energy efficiency programs and $6,737,000 allocated to low income/rate assistance programs. Total spent $5,356,493 on energy efficiency programs and $6,472,317 on low income/rate assistance programs. Funded through the Public Benefit Charge component.

Imperial Irrigation District Overview

As the third largest power provider in California, IID controls more than 1,200 megawatts of energy derived from a diverse resource portfolio that includes its own generation, and long- and short-term power purchases. IID's Energy Department provides electric power to more than 152,000 customers in the Imperial Valley and parts of Riverside and San Diego counties.

As a consumer-owned utility, IID works to efficiently and effectively meet our customers' demands at the best possible rates, tying our area's low-cost of living directly with low-cost utilities. Our diverse resource portfolio provides our customers with some of the lowest cost rates in southern California which is critical given unemployment rates within the service territory are among the highest in the nation.

IID's energy efficiency programs are a key factor in the utility's overall goal. These programs provide a positive impact on utility cost by stabilizing energy consumption and reducing purchases of expensive peak power. Additionally, customers are provided with an opportunity to take charge of their energy utilization and by doing so, reducing their electricity consumption and cost.

Major Program Changes

Our program portfolio and rebate levels remained steady during this program year. A mid-year increase in our Energy Rewards rebate program budget allowed for additional participation, particularly in the HVAC replacement measurement.

Program Highlight

In 2015, IID saw an increase in non-residential lighting measures, resulting in almost 4,000,000 kWh in saving. LED products becoming more cost effective year after year are resulting in a higher return on investments, enticing customer installations. Additionally, Proposition 39 was the main driver of several large lighting retrofit projects within our service territory.

Program Descriptions

Commercial Customer Programs:

- Custom Energy Solutions Program (CESP) – designed to promote energy efficiency by offering financial incentives to commercial customers who install energy-efficient equipment. IID provides qualifying electrical account customers with expertise to assist in identifying energy efficiency measures and cost saving opportunities.
- New Construction Energy Efficiency Program – is a new construction and renovation energy efficiency program that combines an integrated design process with financial incentives for energy saving design at least 10% over the current Title 24 requirements for a building envelope; or as a *systems approach* method for individual measures.
- Quality AC Maintenance Program – participating small commercial customers may receive a variety of services that include duct tight & seal (DTS), refrigerant charge adjustment (RCA), inspection of all electrical connections & tightening, inspection of all moving parts & lubrication, inspection of condensate drain, inspection of system controls & thermostat settings and cleaning of evaporator & condenser air conditioning coils.
- Low-Income Direct Install Program – an effort toward IID customers currently on the REAP program to provide home improvements that reduce electricity consumption resulting in financial relief. When possible, the Southern California Gas Energy Savings Assistance Program will be leveraged to provide the same customer home improvements that reduce natural gas consumption resulting in additional financial relief.
- Small Commercial Energy Audits – allows commercial customers (demand less than 100 kW) to quantify energy consumption and evaluate measures that can be applied to make a facility more energy efficient. An assessment will identify problems that may, when corrected, save the customer a significant amount of money over time.
- Large Commercial Energy Audits - allows commercial customers (demand greater than 100 kW) to quantify energy consumption and evaluate measures that can be applied to make a facility more energy efficient. An assessment will identify problems that may, when corrected, save the customer a significant amount of money over time.

Residential Customer Programs:

- Energy Rewards Rebate Program – offers residential customers prescriptive rebates for qualified energy efficient measures. Qualifying residential measures must retrofit, replace or upgrade old equipment with new, energy-efficient technologies that meet and exceed the Title 24 standards in effect at the time of installation.
- Quality AC Maintenance Program – participating residential customers may receive a variety of services that include duct tight & seal (DTS), refrigerant charge adjustment (RCA), inspection of all electrical connections & tightening, inspection of all moving parts & lubrication, inspection of condensate drain, inspection of system controls & thermostat settings and cleaning of evaporator & condenser air conditioning coils.

- Residential Energy Audits – allows residential customers to quantify energy consumption and to determine measures that can be applied to make a customer's home more energy efficient. An assessment will identify conditions that may, when corrected, save the customer a significant amount of money over time. IID offers energy audits and customized reports to customers.
- Refrigerator Recycling – IID offers free refrigerator pick up and proper recycling services. In addition, customers also receive a $50 incentive for each qualified refrigerator or freezer.

EM&V

IID contracts with an independent third party to complete an Evaluation Measurement & Verification (EM&V) of energy efficiency programs on a bi-annual basis, covering programs for the two-year cycle. Not all programs are evaluated in each evaluation cycle. Programs that generate the most energy savings are included in each evaluation and others are included on an as-needed basis. An EM&V has been completed for program years 2012 and 2013. IID is scheduled to perform and evaluation of 2014 and 2015 programs within the next calendar year. Full results and report will be submitted to SCPPA and incorporated in the SB1037 report accordingly.

Copies of IID's EM&V reports for previous program years are available online at http://www.ncpa.com/current-issues/energy-efficiency-reports.html

Sources of Energy Savings

IID utilized a combination of savings from the TRM, utility work papers and custom savings when applicable. For the prescriptive rebate program the district relied on the deemed savings provided by the TRM as the individual efficiency measure's performance characteristics and use conditions were well known and consistent. Subsequently for the custom programs, custom savings were calculated taking into account the properties of existing equipment, replacement equipment and future use.

Complimentary Programs

- Green Grants:
  Funding is available to non-profit organizations located in IID's service area and is limited to energy efficiency/management upgrades and investments in renewable resources that are not covered under any other existing public benefit program offered by IID or otherwise approved by IID's Energy Consumer Advisory Committee and Board of Directors.

- Renewable Energy Programs:
  - SB1 Solar Solutions Program - IID offers incentives to customers who install solar systems. Two types of incentives are offered: Expected Performance Based Incentive (EPBI) and Performance Based Incentive (PBI). The EPBI incentive is a one-time payment based on verified solar energy system characteristics such as location, system size, shading and orientation. The PBI incentive is a flat cents-per-kWh paid annually, for all verified output from a solar energy system over its initial five years of operation.

- Net Energy Metering – IID pays net-surplus customers for generating excess electricity produced by eligible solar or wind power systems. Customers can also elect to receive a kilowatt credit rather than monetary compensation at rates established by the utility.

- Low-Income Programs:
  As a large number of IID's residential customers participate in our income-qualified programs, a significant portion of revenue generated through the public benefits charge is allocated toward these programs. Program expenditures for the 2015 year totaled over $6.5M, with an average enrollment of 14,014 customers.
  - Residential Energy Assistance Program – provides customers with a discounted rate on their electric bill. Qualification is based on the number of residents per household and the total gross income of all the income sources in the home.
  - Emergency Energy Assistance Program – provides financial assistance to customers facing a financial crisis and disconnection for nonpayment.
  - Medical Equipment Energy Assistance Program – provides a reduced electrical rate for a defined quantity of electricity used to operate medical equipment. The household must include a full-time resident who requires specific medically necessary electric equipment to sustain life or prevent deterioration of a person's medical condition.

- Energy Storage:
  Construction initiated on the District's first ever battery energy storage system in November of 2015. The battery energy storage project is a 30-megawatt, 20-megawatt-hour lithium-ion battery storage system that will increase reliability across the IID grid by providing the ability to balance power and integrate solar while providing spinning reserve and black start power restoration capabilities. The project is currently in construction and is expected to be online by September 2016.

IMPERIAL IRRIGATION DISTRICT – FY 2014/2015 ENERGY EFFICIENCY RESULTS

Imperial ID		Resource Savings Summary									Cost Summary			
Program Sector (Used in CEC Report)	Category	Units Installed	Gross Coincident Peak Savings (kW)	Gross Annual Energy Savings (kWh)	Gross Lifecycle Energy Savings (kWh)	Net Coincident Peak Savings (kW)	Net Annual Energy Savings (kWh)	Net Lifecycle Energy Savings (kWh)	Net Lifecycle Gas Savings (MMBtu)	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)	Utility ($/kWh)
Appliances	Res Clothes Washers													
HVAC	Res Cooling	59,077	7,882	5,031,258	40,074,257	6,452	3,943,639	30,736,884		19,449	$2,670,675	$480,187	$3,150,861	$0.13
Appliances	Res Dishwashers													
Consumer Electronics	Res Electronics													
HVAC	Res Heating													
Lighting	Res Lighting	5,845	224	216,037	1,136,585	215	208,461	1,098,706		623	$72,660	$18,863	$91,523	$0.10
Pool Pump	Res Pool Pump	467	150	710,892	7,108,920	131	618,476	6,184,760		3,694	$53,586	$83,969	$137,555	$0.03
Refrigeration	Res Refrigeration	624	26	182,101	1,396,060	18	136,873	1,108,875		626	$41,825	$22,949	$64,774	$0.07
HVAC	Res Shell	16,889	1,136	215,600	4,493,990	988	187,572	3,909,771		2,328	$83,088	$45,423	$128,511	$0.05
Water Heating	Res Water Heating													
Comprehensive	Res Comprehensive	1,247	75	394,679	1,486,378	60	326,213	1,280,980		763	$190,987	$46,448	$237,435	$0.21
Process	Non-Res Cooking													
HVAC	Non-Res Cooling	2,355	496	1,400,225	20,373,708	388	1,156,677	16,698,297		10,387	$547,617	$78,927	$626,544	$0.06
HVAC	Non-Res Heating													
Lighting	Non-Res Lighting	1	1,354	4,747,112	80,700,907	1,124	3,940,098	66,981,672		39,672	$386,954	$217,023	$603,977	$0.01
Process	Non-Res Motors													
Process	Non-Res Pumps													
Refrigeration	Non-Res Refrigeration	1	12	331,303	5,963,458	10	279,123	5,024,214		2,800	$79,448	$13,694	$93,142	$0.03
HVAC	Non-Res Shell	3	131	1,119,569	27,989,225	110	940,438	23,510,949		14,280	$89,566	$41,708	$131,273	$0.01
Process	Non-Res Process	1	28	247,515	4,455,270	24	209,150	3,764,703		2,098	$44,553	$10,261	$54,814	$0.02
Comprehensive	Non-Res Comprehensive	36	27	58,980	176,940	21	47,184	141,552		86	$22,338	$13,745	$36,083	$0.28
Other	Other													
SubTotal		86,545	11,542	14,655,272	195,355,699	9,541	11,993,905	160,441,364		96,804	$4,283,296	$1,073,197	$5,356,493	$0.05
T&D	T&D													
Total		86,545	11,542	14,655,272	195,355,699	9,541	11,993,905	160,441,364		96,804	$4,283,296	$1,073,197	$5,356,493	

EE Program Portfolio	TRC Test	**1.50**
	PAC Test	**4.02**

Excluding T&D

LASSEN MUNICIPAL UTILITY DISTRICT

Lassen Municipal Utility District at a Glance

- Year established: 1988
- Climate Zone(s): 16
- Number of retail customer connections: 10,500
- Percent of retail sales by customer class – 53% residential, 36% commercial, 4 % industrial, 7% agriculture
- Budgeted amount for energy efficiency programs: $550,000; Energy Efficiency Program Expenditures: $225,541. Unused EE dollars are reallocated to other Public Benefits programs

Lassen Municipal Utility District Overview

LMUD remains committed to helping their customers manage their energy use through energy education and a comprehensive menu of energy efficiency incentives. LMUD manages a comprehensive energy efficiency incentive program for residential & commercial customers focusing on peak load reduction and energy conservation. For residential customers, rebates are offered for the installation of various energy efficiency measures. For commercial customers, rebates are available for upgraded lighting, refrigeration equipment, HVAC equipment, and in cases where an analysis is performed rebates can be offered for additional equipment that reduces energy use and/or demand. Many customers are not able to participate in standard rebate programs that require significant capital investment of their own. To compensate for this, LMUD periodically offers direct install programs at no cost to commercial and residential customers that provide energy saving and other benefits.

Major Program Changes

There were not significant changes to LMUD's standard program offerings in FY15. LMUD plans to do a complete review of all programs in FY16.

Program Highlight

In FY15, LMUD implemented a Direct install Program that offered screw-in LEDs, CFLs, high performance showerheads and faucet aerators to our residential customers at no charge. This was an extremely popular program with our customers, and provided the largest savings of our FY15 offerings. The Residential DI program accounted for 167,522 kWh of FY15 net savings. Eight customers participated in our SmartLight commercial lighting program. Savings from these projects accounted for 67,715 kWh of the FY15 net savings. The remaining savings were achieved through customer participation in our residential HVAC, water heating, appliance and lighting rebate programs. LMUD's EE programs acquired net savings of 264,490 kWhs, and a net demand reduction of 56 kW.

Program Descriptions

- Residential Rebate Program: LMUD provides rebates to customers who purchase and install ENERYGSTAR® appliances and energy efficient electric water heaters and solar water heaters.

LMUD also provides a residential lighting program, providing rebates for replacing incandescent bulbs with CFLs and LEDs along with a variety of other lighting incentives. LMUD also offers rebates for the installation of energy efficiency heat pumps, central air conditioning and evaporative coolers.

- Residential Direct Install Program: Offered LEDs, CFLs, showerheads and faucet aerators to customers at no charge.
- Custom Energy Projects: LMUD offers customized rebate programs to larger customers who have special projects that do not fit into existing rebate categories.
- Energy Audits: Commercial customers may request an onsite energy audit, provided free of charge by LMUD.
- "SmartLight": SmartLight was introduced in 2008 and is LMUD's commercial lighting retrofit program. The program offers commercial customers rebates to encourage them to upgrade older, inefficient lighting.

EM&V

LMUD internally evaluates their energy efficiency programs. EM&V is done on a continual basis. However, in the coming year, LMUD plans on working with an outside agency to fully assess the effectiveness of all EE programs.

Sources of Energy Savings

For FY15, LMUD has revised the savings estimates based on the Technical Resource Manual. Savings for the commercial SmartLight program are based on the wattage reduction achieved comparing pre and post fixtures and controls, and annual operating hours.

Complimentary Programs

- Community Projects Program: Local non-profit entities submit projects based on the four guidelines of AB 1890. Qualifying projects are eligible for financial incentives equal to 50 percent of the project expenses (with a limit of $25,000).
- Energy Conservation Assistance Program (ECAP): ECAP is LMUD's low-income rate assistance program. The program is income based and allows between a 50% and 20% discount on customers first 1,000 kWh. The program also works with local service agencies to provide energy conservation classes to participating customers.
- Consumer Education: LMUD strives to reach each of our customers to educate them and help them reduce their energy consumption. The LMUD web site, Facebook page and *Ruralite* magazine offer current energy conservation tips and advice on how to implement energy conservation measures. Through the website and the *Ruralite* magazine, customers are encouraged to call our efficiency experts for help to determine their energy usage and identify appropriate conservation measures.

LASSEN MUNICIPAL UTILITIES DISTRICT – FY 2014/2015 ENERGY EFFICIENCY RESULTS

Lassen		Resource Savings Summary									Cost Summary			
Program Sector (Used in CEC Report)	Category	Units Installed	Gross Coincident Peak Savings (kW)	Gross Annual Energy Savings (kWh)	Gross Lifecycle Energy Savings (kWh)	Net Coincident Peak Savings (kW)	Net Annual Energy Savings (kWh)	Net Lifecycle Energy Savings (kWh)	Net Lifecycle Gas Savings (MMBtu)	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)	Utility ($/kWh)
Appliances	Res Clothes Washers	41		11,644	128,084		3,610	39,706		20	$1,435	$580	$2,015	$0.07
HVAC	Res Cooling	72	4	1,378	19,775	3	1,102	15,820		10	$57,049	$504	$57,553	$5.04
Appliances	Res Dishwashers	20		1,128	11,280		677	6,768		3	$700	$99	$799	$0.15
Consumer Electronics	Res Electronics													
HVAC	Res Heating													
Lighting	Res Lighting	944	11	17,556	242,340	6	13,499	191,142		96	$5,910	$2,783	$8,693	$0.06
Pool Pump	Res Pool Pump													
Refrigeration	Res Refrigeration	69		8,920	121,130		6,307	85,479		46	$3,450	$1,677	$5,127	$0.08
HVAC	Res Shell													
Water Heating	Res Water Heating	41	11	6,765	67,650	7	4,059	40,590		22	$7,567	$748	$8,315	$0.26
Comprehensive	Res Comprehensive	1	31	186,136	1,302,952	28	167,522	1,172,657		662	$89,370	$26,348	$115,718	$0.12
Process	Non-Res Cooking													
HVAC	Non-Res Cooling													
HVAC	Non-Res Heating													
Lighting	Non-Res Lighting	1	16	84,644	1,100,372	12	67,715	880,298		488	$7,900	$19,420	$27,320	$0.04
Process	Non-Res Motors													
Process	Non-Res Pumps													
Refrigeration	Non-Res Refrigeration													
HVAC	Non-Res Shell													
Process	Non-Res Process													
Comprehensive	Non-Res Comprehensive													
Other	Other													
SubTotal		1,189	73	318,171	2,993,583	56	264,490	2,432,459		1,347	$173,381	$52,160	$225,541	$0.12
T&D	T&D													
Total		1,189	73	318,171	2,993,583	56	264,490	2,432,459		1,347	$173,381	$52,160	$225,541	

EE Program Portfolio	TRC Test	**1.26**
	PAC Test	**1.17**

Excluding T&D

LODI ELECTRIC UTILITY

LEU at a Glance

- Established in 1910
- Climate Zone 12
- 25,912 customers (22,355 residential; 3,557 commercial/industrial; FY2014-2015)
- Residential Customer sales: 148,950,428 kWh (34%)
- Commercial Customers sales: 161,015,810 kWh (37%)
- Industrial Customer sales: 128,814,673 kWh (29%)
- Budgeted amount for energy efficiency programs, funded the Lodi Public Benefits EE Programs: $617,900 (FY2014-2015). Energy Efficiency Program Expenditures: $306,286
- Load growth: .34% in kWh (from FY2013-2014 to FY2014-2015)

LEU Overview

Lodi's Commercial and industrial customers continue to produce the majority of energy savings achieved in Lodi Electric Utility's (LEU's) energy efficiency program portfolio. For the FY2014-2015, commercial lighting upgrades accounted for 56% of the acquired energy savings.

Lodi's residential customers continue to achieve the greatest energy savings through HVAC replacements, water heating, insulation improvements and the purchase and installation of ENERGY STAR ® appliances such as refrigerators, dishwashers, front-load clothes washers and pool pumps.

Major Program Changes

In FY2014-2015, LEU performed a complete review of their energy efficiency program offerings to all customer segments. A TRC analysis was done for all measures based on the TRM, and rebate levels were adjusted accordingly. LEU increased the incentives to commercial/industrial customers for lighting upgrades and custom projects. The rebate cap was also increased for most commercial customers as well. Marketing and outreach efforts continued for all customers (residential and non-residential), through newspaper advertisements, utility bill inserts and our web site.

Program Highlight

Since 1998, LEU has spent more than $7 million on demand-side management rebates and programs designed to increase energy efficiency for the community. The Commercial/Industrial Rebate Program continues to be the main "driver" in regards to overall energy savings achieved. Through key accounts management, the utility maintains a proactive and positive relationship with Lodi's largest energy consumers. These relationships have encouraged large commercial and industrial customers to engage and pursue lighting retrofits, process equipment improvements, etc.

FY2014-2015 Commercial/Industrial Customer Programs

- Lodi Commercial/Industrial Rebate Program: Provides rebates of up to $27,500 to commercial and industrial customers; the rebate is for pumps/motors, process equipment improvements, building envelope improvements, HVAC/chiller replacements, and high efficiency lighting retrofits.
- Lodi Energy Efficiency (On-Bill) Financing Program: two-year, interest free loans of up to $150,000 are available for commercial and industrial customers who install designated and approved energy efficiency

measures. The customer may also be eligible for the aforementioned energy efficiency rebates, in conjunction with this financing program.

FY2014-2015 Residential Customer Programs

- Lodi Appliance Rebate Program: Provides rebates to all customers who purchase an ENERGY STAR ® refrigerator, dishwasher and/or front-loading clothes washer.
- Lodi Energy Efficient Home Improvement Rebate Program: Provides rebates to customers for installing attic/wall insulation, attic fans, whole house fans, shade screens/window tinting, radiant barriers, LED lighting as well as for repairing/replacing HVAC duct systems, and for installing high efficiency (15+ SEER) air conditioning units.
- HVAC System Performance Test: Provides a rebate for customers who utilize a select list of HVAC contractors capable of performing a high-end duct system performance test (the test measures air flow, air return and system balance).

FY2014-2015 Commercial and Residential Programs

- Lodi Energy Audit Program: This program provided on-line and on-site energy audits to residential and small commercial customers.

FY2014-2015 Educational Outreach Programs

- Lodi LivingWise Program: Provided curriculum to 16 teachers and home energy efficiency "kits" and manuals to 448 6th grade students in Lodi schools; the program is designed to teach the students the basics of energy and water conservation and allows them to install and experience energy efficient devices within their own homes.
- Youth Energy Summit: Provides scholarship opportunities for juniors and seniors in high school; the eligible students must participate in a two-day workshop, then complete a community service learning project, based upon the information they garner from the Summit/training. After completing their "project," the student teams present their findings and projects to a panel of judges, who in turn award the scholarship funds. This year our team of students from Tokay High School proudly took home first place.

EM&V

LEU has implemented an Evaluation, Measurement & Verification (EM&V) Plan, and has completed seven consecutive annual assessments (reports) of randomly selected programs and large rebates as part of the designed EM&V Plan. Our EM&V reports are available for review at: www.ncpa.com/policy/reports/emv/. The annual assessment for FY2014-2015 is expected to be completed by June 30, 2016.

Sources of Energy Savings

The TRM is the source for the majority of the savings. The Commercial/Industrial Lighting and Custom Programs savings are based on custom calculations.

Complimentary Programs

- FY2014-2015 Low-Income Residential Programs:
    - *Lodi C.A.R.E. Package Program:* Provides grants to very low-income customers in need of assistance paying their electric utility account; the program coordination/customer screening is performed by the Lodi Salvation Army.

- *Lodi SHARE Discount Rate:* LEU provides a rate discount of 30% for qualifying residential customers on their electric utility monthly billing statement; $400,000 annually is budgeted for this rate discount from the Lodi Public Benefits Program fund.

- Electric Vehicles
  - LEU is a proud partner with the California Municipal Utilities Association, the California Center for Sustainable Energy and the Clean Vehicle Rebate Project in the promotion of PEV's in our community and in California. LEU continues to provide a total of seven free Level 2 charging stations at five municipal parking facilities. LEU also offers customers a discounted EV charging rate.

LODI ELECTRIC UTILITY – FY 2014/2015 ENERGY EFFICIENCY RESULTS

Lodi		Resource Savings Summary									Cost Summary			
Program Sector (Used in CEC Report)	Category	Units Installed	Gross Coincident Peak Savings (kW)	Gross Annual Energy Savings (kWh)	Gross Lifecycle Energy Savings (kWh)	Net Coincident Peak Savings (kW)	Net Annual Energy Savings (kWh)	Net Lifecycle Energy Savings (kWh)	Net Lifecycle Gas Savings (MMBtu)	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)	Utility ($/kWh)
Appliances	Res Clothes Washers	50		11,083	121,913		3,436	37,793		19	$4,450	$3,057	$7,507	$0.26
HVAC	Res Cooling	179	21	11,843	193,301	17	9,475	154,641		95	$23,286	$13,439	$36,725	$0.34
Appliances	Res Dishwashers	19		1,102	11,020		661	6,612		3	$950	$536	$1,486	$0.28
Consumer Electronics	Res Electronics	3		72	576		58	461			$27	$107	$134	$0.35
HVAC	Res Heating													
Lighting	Res Lighting	952	2	17,601	264,015	1	9,505	142,568		72	$6,248	$16,414	$22,662	$0.22
Pool Pump	Res Pool Pump	32	1	22,143	221,433	1	13,286	132,860		67	$8,000	$10,762	$18,762	$0.18
Refrigeration	Res Refrigeration	105		13,650	191,100		9,555	133,770		73	$10,500	$14,442	$24,942	$0.26
HVAC	Res Shell	72,314	73	90,889	1,769,952	20	25,955	505,717		285	$43,443	$16,943	$60,386	$0.18
Water Heating	Res Water Heating	1		800	8,000		480	4,800		3	$200	$115	$315	$0.08
Comprehensive	Res Comprehensive	1	103	81,806	1,227,090	83	65,445	981,672		554	$54,200	$12,600	$66,800	$0.10
Process	Non-Res Cooking													
HVAC	Non-Res Cooling	4		963	14,443		818	12,277		7	$1,224	$5	$1,229	$0.14
HVAC	Non-Res Heating													
Lighting	Non-Res Lighting	1	67	337,993	5,069,895	57	287,294	4,309,411		2,388	$49,316	$1,100	$50,416	$0.02
Process	Non-Res Motors	1		97,674	1,465,110		83,023	1,245,344		662	$14,651	$271	$14,922	$0.02
Process	Non-Res Pumps													
Refrigeration	Non-Res Refrigeration													
HVAC	Non-Res Shell													
Process	Non-Res Process													
Comprehensive	Non-Res Comprehensive													
Other	Other													
SubTotal		73,662	268	687,619	10,557,848	179	508,990	7,667,924		4,229	$216,496	$89,790	$306,286	$0.06
T&D	T&D													
Total		73,662	268	687,619	10,557,848	179	508,990	7,667,924		4,229	$216,496	$89,790	$306,286	

EE Program Portfolio	TRC Test	**1.33**
	PAC Test	**2.82**

Excluding T&D

City of Lompoc Electric at a Glance

- Established in 1923
- Climate Zone 5
- 15,027 retail customer connections – 88% residential; 11% commercial, 1% municipal. The City has no agriculture sales.
- Percent of retail sales by customer class – 38.8% residential; 48.8% commercial; 12.4% municipal
- The budgeted amount for energy efficiency programs for Fiscal Year (FY) 2014-15 was $130,000.00 from public goods charge collected fees. The amount expended was $70,124.00. Any collected fees not expended are restricted and carried over to succeeding years.

Utility Overview

Trends in the local community such as the climate, continued drought conditions and the demographics of the City of Lompoc impact the success of energy efficiency programs.

The City of Lompoc is located in the Central Coast region which provides a mild Mediterranean climate year round. Due to the mild climate, air conditioning is not installed in residential buildings and is limited in commercial buildings. The average residential electric consumption per month is 325 kWh. The peak load for the City is in the winter. Since there is little need for air conditioning in our coastal climate and heating is primarily done with gas, the majority of rebate programs are for lighting and refrigeration retrofits.

The continued drought has increased the number of customers participating in water retrofit programs. The City also provides water service to its customer and provides a variety of water conservation incentive programs. Programs offered include clothes washer and dishwasher replacements, toilet retrofits, rain barrel and landscape conversions. Customers are choosing to spend available funds on upgrades that will save water. Water retrofit programs are not funded by Public Benefits and therefore are not reported.

Although Lompoc serves both residential and commercial customers, 88% of its retail connections are residential; 42.3% of residential connections are multifamily homes; 71% are considered to be very low to median income customers and 23% of these are below poverty level (taken from the 2014 American Community Survey). In order to encourage participation in energy efficiency programs, the City continues to provide programs that heavily subsidize the initial purchase of appliances.

Major Program Changes

To participate in the Commercial Lighting Retrofit and Custom Lighting programs, customers are now required to obtain a permit from the City of Lompoc Building Department to do any retrofits. This

requirement has discouraged many of the small commercial customers with limited funds from participating due to perceived added costs, code and standard requirements and the permit inspection process.

There has been slow economic growth since the recession began in 2007. Since that time, several businesses in Lompoc have had to close leaving vacant spaces that have remained. The majority of the City's commercial customers are small businesses that rent their location, have relatively low electric bills, and are unwilling to perform retrofits due to the initial costs. Most of the larger commercial customers or demand customers who have long-term leases or who own the property, have taken advantage energy efficiency programs in the past. City Staff will be increasing marketing efforts in this area and surveying the needs of these customers to find additional opportunities for energy efficiency savings.

Program Highlight

Because the majority of customers are residential customers, the City's rebate programs have been concentrated on and are most used by residential customers. The most popular programs were Residential Refrigeration and Low Income Refrigeration programs. The low income program is popular due to the larger incentive. The residential refrigeration programs and non-residential lighting program did provide the largest energy savings. Only four commercial customers participated in the Commercial Lighting Rebate.

Customer education programs are providing a good source of energy efficiency savings. Customers taking advantage of energy audits are reporting reduced energy use from the audit results. In FY 2014-15, the City completed the conversion of electric meters to Automatic Meter Reading (AMR). The ability for staff to review hourly data through a fixed network has been an excellent tool in assisting customers with understanding energy use in their homes and businesses and identifying ways to save energy by using a behavioral science approach.

Program Descriptions

Res Refrigeration:

- Energy Star Refrigerator/Freezer: A rebate of $144 is offered for the purchase of an Energy Star appliance to replace a working refrigerator or freezer using at least 316 kWh more energy than the replacement appliance. All appliances are recycled at the City of Lompoc landfill.
- Refrigerator/Freezer Recycling: A rebate of $35 is available for any working refrigerator or freezer that is recycled at the City landfill. The City offers free delivery to landfill.
- Income Qualifying Energy Star Refrigerator Program: The City pays a participating appliance dealer up to $635 toward the purchase of an Energy Star refrigerator to replace a customer's working primary refrigerator. A minimum energy savings of 316Kwh per year is required. Appliance must be recycled at the City landfill.

Res Lighting:

- LED Bulb Exchange Rebate: Rebates are available to exchange an incandescent bulb with an Energy Star LED bulb. Customer must visit the utility office.

- LED Holiday Light Rebate: The City offers a rebate of up to $8 per light string purchased. Each customer is limited to a rebate of up to five strings per year.

Non-Res Lighting:

- Commercial Lighting Rebate: Provides rebates for energy efficient lighting upgrades from T12 to T8, T5 or LED lighting.
- Exit Sign Rebate: Provides a $15 rebate to replace an incandescent exit sign with an LED exit sign.

Non-Res Process:

- Customized Rebate Program: Provides a rebate of $.15 per watt saved for retrofits not covered by the lighting or other rebate programs.

EM&V

Lompoc's EM&V reports can be found at http://www.ncpa.com/current-issues/energy-efficiency-reports.html. An evaluation of the Residential Lighting Programs are planned to be conducted in the FY 2015-16 fiscal year. All appliance, lighting and custom rebate programs require a staff member to perform pre-and post-inspections and an on-site energy audit. All appliance and lighting rebates require verification of disposal from the City landfill.

Sources of Energy Savings

2014 TRM and Energy Star were used the most to determine energy savings. KEMA 2009 report, Deer 2011 and PG&E workpapers were also used.

Complimentary Programs

- Renewable Energy Programs: Lompoc offered residential and commercial customers an incentive to install a solar system of $1.50 per watt in 2015. A rebate of $1.00 per watt is available for 2016. Rebates will be eliminated in 2017. The City no longer offers net energy metering.
- Low Income Programs: The City provides financial assistance to Customers that are below low to moderate income levels (as determined by HUD). The assistance is $9.00 per month toward their electric usage charge. These customers can apply for the Income Qualifying Refrigerator program.
- Energy Audits: Residential and commercial onsite audits are available at no cost.
- School and Community Education Programs: Energy conservation and electric safety programs are provided.
- Monitor Lending Program: Customers can borrow a Kill-A-Watt monitor to measure the energy use of appliances.
- Electric Vehicles: The City currently owns 2 electric vehicles and 1 dual port charging station for City vehicles use only. The City is considering applying for a grant to cover the cost of a charging station to be installed in a public location.
- Energy Storage: The City has not identified any cost-effective energy storage projects for our customers.

CITY OF LOMPOC – FY 2014/2015 ENERGY EFFICIENCY RESULTS

Lompoc		Resource Savings Summary									Cost Summary			
Program Sector (Used in CEC Report)	Category	Units Installed	Gross Coincident Peak Savings (kW)	Gross Annual Energy Savings (kWh)	Gross Lifecycle Energy Savings (kWh)	Net Coincident Peak Savings (kW)	Net Annual Energy Savings (kWh)	Net Lifecycle Energy Savings (kWh)	Net Lifecycle Gas Savings (MMBtu)	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)	Utility ($/kWh)
Appliances	Res Clothes Washers													
HVAC	Res Cooling													
Appliances	Res Dishwashers													
Consumer Electronics	Res Electronics													
HVAC	Res Heating													
Lighting	Res Lighting	206	4	6,131	9,463	2	3,311	5,110		3	$1,021	$248	$1,269	$0.27
Pool Pump	Res Pool Pump													
Refrigeration	Res Refrigeration	63	2	59,096	650,056	2	41,367	455,039		247	$11,377	$29,566	$40,943	$0.12
HVAC	Res Shell													
Water Heating	Res Water Heating													
Comprehensive	Res Comprehensive													
Process	Non-Res Cooking													
HVAC	Non-Res Cooling													
HVAC	Non-Res Heating													
Lighting	Non-Res Lighting	496	5	21,574	237,314	5	18,338	201,717		112	$7,262	$14,601	$21,863	$0.14
Process	Non-Res Motors													
Process	Non-Res Pumps													
Refrigeration	Non-Res Refrigeration													
HVAC	Non-Res Shell													
Process	Non-Res Process	2		13,504	148,544		8,102	89,126		47	$464	$5,586	$6,050	$0.09
Comprehensive	Non-Res Comprehensive													
Other	Other													
SubTotal		767	11	100,305	1,045,377	8	71,118	750,993		409	$20,124	$50,000	$70,124	$0.12
T&D	T&D													
Total		767	11	100,305	1,045,377	8	71,118	750,993		409	$20,124	$50,000	$70,124	

EE Program Portfolio	TRC Test	**0.90**
	PAC Test	**1.12**

Excluding T&D

LOS ANGELES DEPARTMENT OF WATER & POWER

LADWP At a Glance

- Established in 1902 to deliver water to the City of Los Angeles. Electricity distribution began in 1916.
- Climate Zones primarily include CZ6 and CZ9.
- Serves almost 4 million people via 1.46 million electric and 676,000 water connections. Nearly 70% of electricity usage is by the commercial/industrial sectors and over 30% by residential customers.
- Budgeted amount for FY 15-16 energy efficiency programs is $144,848,300.
- A peak demand of 6,396 MW was registered in the September 16, 2014.
- Annual energy use is 24.6 million megawatt-hours.
- Load for the years 2001 to 2012 grew by 0.55. When taking into consideration energy efficiency programs, load growth is forecasted to average 0.3% between 2013 and 2033.

LADWP Overview

LADWP is the largest municipal utility in the nation, and the third largest utility in California. The utility faces significant challenges as it works to comply with environmental and code mandates while maintaining quality delivery of services. Increasing renewable energy to 33% by 2020, the continued rebuilding of coastal generation units, replacement of coal, infrastructure reliability investments, and ramping up energy efficiency and other demand side programs are all critical and concurrent strategic actions that LADWP has to carry out over the coming decade.

As part of its planning process, LADWP has committed to a number of energy efficiency activities to meet regulatory mandates and to meet the City's energy needs, including the following goals:

- Leverage energy efficiency as part of the strategy for eliminating coal from LADWP's energy portfolio
- Achieve an energy efficiency goal of 15% by 2020
- Contribute to greenhouse gas emissions reduction through reduced energy usage

Major Program Changes

LADWP is continuing with a dramatic ramp-up in energy efficiency investments and results over previous years. In FY 2015-16, LADWP:

- Increased the annual EE budget to $145M
- Continued to implement the 8 guiding principles adopted in 2012 to guide this increased investment to ensure equity of access to EE for all customers, leverage this investment for job creation, commitment to transparency, and leverage community groups to reach hard- to- reach customers (guiding principles may be found in the LADWP Portfolio Business Plan)

- Updated the detailed Business Plans for the portfolio that are comparably specific to what the IOUs create for their EE funding requests to the CPUC. These plans include the continuation of roughly 20 existing programs and 10 new programs. Water Conservation Programs have been added to the Fiscal Year 2014/15 – 2019/20 Portfolio Business Plan for the first time
- Continued LADWP's partnership with SoCal Gas to deliver joint programs in order to offer mutual customers electric, gas, and water savings in a "one stop shop". Eleven new programs have been launched under this successful partnership, with 5 more pending
- Dedicated approximately $60M of the EE portfolio to Direct Install programs (equipment and installation completely free) to serve LADWP's low- moderate- and fixed-income customers, both residential and non-residential. These include the Home Energy Improvement Program, Small Business Direct Install, and LAUSD Direct Install Program
- Achieved 18% more energy savings in FY 14/15 than in FY 13/14.

Mass Market Program Descriptions

- Small Business Direct Install: The Small Business Direct Install Program is a free direct-install program that targets small and medium business customers in the LADWP service territory. LADWP is partnering with Southern California Gas Company on this Program to offer a tri-resource efficiency program aiming to reduce the use of electricity, water and natural gas. (Non-Res Lighting)
- Los Angeles Unified School District Direct Install (LAUSD DI): The Los Angeles Unified School District Direct Install Program is designed to improve energy and water efficiency throughout LAUSD's facilities through upgrades in electric, water and natural gas consuming systems, in partnership with the Southern California Gas Company (SoCalGas). This Program provides energy efficiency design assistance, project management experience and retrofitting installation, utilizing LADWP engineering and ISS (Integrated Support Staff), to assist LAUSD facilities in need of aid in reducing energy usage and corresponding utility expenses. (Non-Res Lighting)
- Home Energy Improvement Program (HEIP): The Home Energy Improvement Program is a comprehensive direct install whole-house retrofit program that offers residential customers a full suite of free products and services to improve the energy and water efficiency in the home by upgrading/retrofitting the home's envelope and core systems. While not limited to low-income customers, HEIP's priority is to serve the most needy customers. (Res Shell, Res Lighting)
- Low-Income Refrigerator Replacement Program (LIREP): The Low-Income Refrigerator Replacement Program is a free refrigerator replacement program designed to target customers that qualify on either LADWP's Low-Income or its Senior Citizen/Disability Lifeline Rates. This Program leverages a 3rd Party Contractor, ARCA (Appliance Recycling Centers of America), to administer the delivery of the Program and provides energy efficient refrigerators for this customer segment to replace older, inefficient, but operational models.(Res Refrigeration)
- Refrigerator Turn-in and Recycle (RETIRE)Program: The Refrigerator Turn-in and Recycle Program offers a $50 rebate, along with free pick-up, to residential customers to turn-in old refrigerators and freezers, for recycling. Eligible units must be fully operational and satisfy certain

age and size requirements. LADWP leverages a 3rd Party Contractor, ARCA (Appliance Recycling Centers of America), to administer the delivery of the Program. (Res Refrigeration)

- Consumer Rebate Program (CRP): The Consumer Rebate Program offers incentives of up to $500 or more, to its residential customers to promote and advance comprehensive energy efficiency measures, including whole house solutions, plug load efficiency, performance standards and opportunities for integration. CRP is designed to offer and promote specific and comprehensive energy solutions within the residential market sector. (Res Cooling, Res Shell, Res Refrigeration, Res Pool Pump)
- Energy Upgrade California™ (EUCA): The Energy Upgrade California™ Program is a collaborative effort among California counties, cities, non-profit organizations, the state's investor-owned utilities, and publicly owned utilities to deliver a California statewide "whole house" residential retrofit energy efficiency program, in which LADWP partners with Southern California Gas Company (SoCalGas). EUCA offers incentives to homeowners who complete selected energy-saving home improvements on single-family residences or 2-4 unit buildings, such as townhouses, condominiums, etc. (Res Cooling, Res Comprehensive, Res Lighting, Res Water Heating, Res Shell)

Commercial, Industrial, Institutional (CII) Programs Descriptions

- Commercial Lighting Incentive Program (CLIP): The Commercial Lighting Incentive Program is a new program, launched October 1, 2014, designed to leverage the previous lighting program successes while offering greater flexibility to lighting projects. This new design is intended to make CLIP as user friendly as possible, streamlining the application and administration process, leveraging participating contractors and the Trade Ally Program, to the degree possible and to capture the maximum energy savings and enhance the customer experience. (Non-Res Lighting)
- Savings By Design (SBD): The Savings By Design (SBD) Program is a California statewide non-residential new construction program, in which LADWP will partner with Southern California Gas Company (SoCalGas) to offer a uniform, multi-faceted program designed to consistently serve the needs of the commercial building community. SBD encourages energy-efficient building design and construction practices, promoting the efficient use of energy by offering up-front design assistance, owner incentives, design team incentives, and energy design resources. (Non-Res Comprehensive)
- Retrocommissioning (RCx) Express: The Retrocommissioning Express Program offers cash incentives to customers who undertake a "tune-up" of their existing building system equipment to restore equipment to its original performance level, as designed, if not higher. Incentives are offered for measures on a prescriptive menu of options, including replacement or repair of certain lighting sensors, air conditioning economizers, restoration of fan and pump variable frequency drives, operations set point strategies for supply air, temperature or duct pressure, chilled water and condenser water, operating schedules and boiler lockout. (Non-Res Comprehensive)
- Refrigeration Program: The Refrigeration Program offers incentives to encourage retrofit measures and technologies to reduce energy consumption in supermarkets, liquor stores, convenience stores, restaurants, etc. Rebates are offered for commercial food appliances and refrigerator

cases, ice machines, reach-in freezers/refrigerators, display cases, walk-in coolers, etc., as well as other refrigeration equipment. (Non-Res Refrigeration)

- Custom Performance Program (CPP): The Custom Performance Program offers cash incentives for energy saving measures not covered by existing prescriptive programs, such as equipment controls, industrial processes and other innovative energy saving strategies exceeding Title 24 or Industry Standards that are not included in other LADWP non-residential energy efficiency programs. In addition, the Chiller Efficiency Program is now part of the CPP; employing energy modeling using LADWP approved software in calculating energy savings for incentives. Other program offerings include incentives for equipment controls, CO monitoring systems, hotel guest room controls, variable frequency drives, cutting edge high-efficiency lighting technologies, and other innovative strategies. (Non-Res Cooling, Non-Res Comprehensive, Non-Res Motors, Non-Res Lighting, Non-Res Refrigeration)
- California Advanced Home Program (CAHP): The California Advanced Home Program is an incentive program that utilizes the statewide CAHP through its partner utility, Southern California Gas Company, to incentivize cost-effective energy efficiency upgrades in residential new construction. CAHP targets high density residential new construction, including single and multi-family high rise buildings, as this is the area with the greatest new construction energy savings potential in LADWP's service territory. (Res Comprehensive)
- Energy Efficiency Technical Assistance Program (EETAP): The Energy Efficiency Technical Assistance Program is a non-resource program that goes a step beyond the assistance offered by standard programs. EETAP was designed to assist commercial, industrial, and institutional customers in closing the gap between project development and implementation for more complex building systems. By providing incentives for project development services including energy auditing and project management, through this program, LADWP aims to help its customers to strategically plan, follow through and realize energy savings in the most cost-effective manner. (Non-Res Comprehensive)

Cross Cutting Programs Descriptions

- Codes, Standards & Ordinances (CSO): The Codes, Standards & Ordinances Program conducts advocacy activities to improve building, appliance and water use efficiency regulations. These activities include monitoring and active participation in code and standard development, compliance and enforcement support with our sister agency LA Department of Building and Safety, legislative review, sponsorship of local ordinances, and participation in policy efforts with other City departments, state agencies, and utilities. The goal of this program is to promote sustainability with regard to water and energy use. The principal audience includes the LA City Department of Building and Safety, LA City Planning, LA City Department of Public Works, and the LA City Council, which together develop and adopt codes and standards specific to Los Angeles that go beyond state and federal regulation. Other audiences include state agencies, which conduct periodic rulemakings to update energy efficiency and water conservation regulations and

standards, and industry groups that conduct research and develop industry specific standards. (Non-Res Process)

- CityPlants: The CityPlants Program provides free shade trees for residents and property owners in Los Angeles to promote the planting of trees to improve building energy efficiency. This is a joint program managed by Million Trees LA and supported by LADWP. Through this partnership, MTLA is able to provide free shade trees for residents and property owners in the City of Los Angeles along with information on where to plant the trees for maximum energy efficiency benefits. CityPlants currently focuses on providing trees for residential customers but will also provide trees to commercial customers. (Res Cooling, Res Shell)
- LADWP Facilities Upgrade: The LADWP Facilities Upgrade Program strives to improve energy and water efficiency throughout LADWP's facilities with energy efficiency upgrades in HVAC and lighting and water efficiency upgrades in plumbing fixtures, leak correction and landscaping improvements. It identifies and assists those LADWP facilities to reduce energy and water usage, which will result in a reduction in energy and water consumption and procurement expense for LADWP that would otherwise be borne by LADWP customers. (Non-Residential Cooling)
- LADWP Emerging Technologies Program (ETP): The LADWP Emerging Technologies Program is designed to accelerate the introduction of innovative energy and water efficient technologies, applications, and analytical tools that are not yet widely adopted in California. By reducing both the performance uncertainties associated with new products, as well as institutional barriers, the ultimate goal of this Program is to increase the probability that promising energy and water efficiency technologies will be commercialized and adopted throughout Los Angeles.
- Program Outreach & Community Partnerships: The Program Outreach & Community Partnerships Program is an advocacy program that strives to improve customer awareness among "Hard-to-Reach" customers of LADWP on electric and natural gas energy efficiency and water conservation programs through community based outreach organizations. In FY 2013/14, this Program offers $45,000 grants to 17 local non-profit organizations that are selected to work in each Los Angeles Council District or on an at-large basis to provide community/customer awareness of LADWP's core energy efficiency and water conservation programs.

EM&V

Results are published on LADWP Website:
https://www.ladwp.com/cs/idcplg?IdcService=GET_FILE&dDocName=OPLADWPCCB436019&RevisionSelectionMethod=LatestReleased
And the California Municipal Utility Association (CMUA) website:
http://cmua.org/wpcmua/wp-content/uploads/2015/08/LADWP_Document.pdf

LADWP has opted to evaluate its programs and activities from a holistic standpoint. Moving forward, LADWP has tasked Navigant to evaluate the energy efficiency market impacts of all the combined efforts of City of Los Angeles (inclusive of LADWP's efficiency programs). The Market Transformation (MT) evaluation is scheduled to be produced by end of 2016 and submitted to the CEC March of 2017. One of

the end results of the MT evaluation would quantify the incremental energy savings due to market intervention introduced by the City of Los Angeles.

LADWP EM&V activities are scheduled as described below:

Program	Fiscal Year(s) Evaluated	EM&V Activities	Final EM&V Report to the CEC
Commercial Lighting Efficiency Offer (CLEO) – Eval 1	FY11-12 and FY12-13	Early 2014	March 2015
Custom Performance Program (CPP) – Eval 1			
Small Business Direct Install Program			
Chiller Efficiency Program (CEP)			
Refrigeration Program (Commercial Grocery Related)			
Consumer Rebate Program (CRP)			
Low Income Refrigerator Exchange Program	FY13-14	Late 2014	
RETIRE Program			
Codes & Standards (C&S) Program	FY12-13 and FY13-14		October 2015
Energy Upgrade California (EUCA) Program – Process Only	FY13-14		
Retrocommissioning (RCx) Express Program	FY13-14 Through 14-15	Late 2014-Early 2015	
Home Efficiency Improvement Program (HEIP)	FY13-14 Through 14-15	Late 2014-Early 2015	
LADWP Facilities (Lighting & HVAC) Upgrade Program	FY13-14 Through 14-15	Late 2014-Early 2015	
Savings By Design Program (Commercial New Construction) - Process Only	FY14-15	Late 2015-Early 2016	March 2016
California Advanced Home Program (CAHP)			
Commercial Lighting Efficiency Offer (CLEO) – Eval 2			
Custom Performance Program and Energy Efficiency Technical Assistance Program (CPP + EETAP) – Eval 2			
Market Transformation Evaluation	FY15-16	2016	March 2017

The total budget for EM&V over the 3 year contract period is $3,705,437 which is equivalent to 0.74% of the total portfolio budget on an annual basis.

Sources of Energy Savings

LADWP calculates energy savings on a project-specific basis for the vast majority of our customer efficiency programs. Deemed savings are used primarily for residential consumer rebates, refrigerator exchange and retirement, and low income residential direct install. These deemed savings are obtained from a combination of the DEER and TRM resources.

Complimentary Programs

- Renewable Energy Programs: Brief description of renewable energy programs for customers, including CSI, community solar, "Greenergy" (customers pay an extra charge to support renewables), et cetera…
- Low-Income Programs: Brief description of low-income programs
- Research, Development, and Demonstration: Brief description of RD&D programs, including electric vehicles, energy storage, codes & standards development, et cetera…
- Electric Vehicles: Brief description of EV / EV charging infrastructure programs/investments
- Energy Storage: Brief description of customer-sited storage programs/investments

LOS ANGELES DEPARTMENT OF WATER & POWER – FY 2014/2015 ENERGY EFFICIENCY RESULTS

LADWP		Resource Savings Summary									Cost Summary			
Program Sector (Used in CEC Report)	Category	Units Installed	Gross Coincident Peak Savings (kW)	Gross Annual Energy Savings (kWh)	Gross Lifecycle Energy Savings (kWh)	Net Coincident Peak Savings (kW)	Net Annual Energy Savings (kWh)	Net Lifecycle Energy Savings (kWh)	Net Lifecycle Gas Savings (MMBtu)	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)	Utility ($/kWh)
Appliances	Res Clothes Washers													
HVAC	Res Cooling	1,924	200	176,822	2,473,190	200	176,822	2,473,190		1,596	$194,090	$313,199	$507,289	$0.28
Appliances	Res Dishwashers													
Consumer Electronics	Res Electronics													
HVAC	Res Heating													
Lighting	Res Lighting													
Pool Pump	Res Pool Pump	2,006	282	1,389,592	13,895,920	282	1,389,592	13,895,920		8,299	$1,003,000	$971,426	$1,974,426	$0.18
Refrigeration	Res Refrigeration	3,259	1,758	11,606,507	121,280,619	1,758	11,606,507	121,280,619		68,454	$6,064,472	$628,889	$6,693,360	$0.07
HVAC	Res Shell	411,735	329	10,081,397	302,080,189	329	10,081,397	302,080,189		179,837	$2,509,387	$1,133,938	$3,643,325	$0.02
Water Heating	Res Water Heating													
Comprehensive	Res Comprehensive	3	6,472	9,618,504	145,078,491	6,472	9,618,504	145,078,491		86,369	$11,153,034	$454,527	$11,607,561	$0.11
Process	Non-Res Cooking													
HVAC	Non-Res Cooling	7,888,459	856	7,888,459	144,002,935	856	7,888,459	144,002,935		92,112	$2,357,409	$1,353,677	$3,711,085	$0.04
HVAC	Non-Res Heating													
Lighting	Non-Res Lighting	11,927,548	10,330	83,835,754	1,095,945,920	10,330	83,835,754	1,095,945,920		649,101	$6,686,804	$27,029,316	$33,716,120	$0.04
Process	Non-Res Motors	36,049,246	4,829	36,049,246	360,434,842	4,829	36,049,246	360,434,842		200,878	$2,644,833	$2,310,646	$4,955,479	$0.02
Process	Non-Res Pumps	1		4,364,369	65,465,535		4,364,369	65,465,535		36,485		$181,407	$181,407	
Refrigeration	Non-Res Refrigeration	391	39	272,509	3,320,228	39	272,509	3,320,228		1,850	$36,842	$74,002	$110,844	$0.04
HVAC	Non-Res Shell	2,533,466	48	2,533,466	28,566,930	48	2,533,466	28,566,930		17,351	$195,628	$245,686	$441,313	$0.02
Process	Non-Res Process	1	13,630	121,781,298	2,435,625,960	13,630	121,781,298	2,435,625,960		1,357,429	$1,150,860	$6,573,713	$7,724,573	
Comprehensive	Non-Res Comprehensive	3,438,408	259	6,781,527	89,431,901	259	6,781,527	89,431,901		54,318	$2,411,612	$893,342	$3,304,954	$0.05
Other	Other													
SubTotal		62,256,447	39,033	296,379,450	4,807,602,659	39,033	296,379,450	4,807,602,659		2,754,080	$36,407,970	$42,163,768	$78,571,738	$0.02
T&D	T&D													
Total		62,256,447	39,033	296,379,450	4,807,602,659	39,033	296,379,450	4,807,602,659		2,754,080	$36,407,970	$42,163,768	$78,571,738	

EE Program Portfolio	TRC Test	**1.52**
	PAC Test	**6.50**

Excluding T&D

MERCED IRRIGATION DISTRICT

Merced Irrigation District At a Glance

- For more than 75 years, the Merced Irrigation District (MID) has been in the business of generating wholesale electrical power.
- MID provides retail electric service to approximately 8,500 customers.
- MID budgeted $375,000 for energy efficiency rebates, allocated between commercial, industrial, agricultural, and residential customers.

Merced Irrigation District Overview

Merced Irrigation District is located in Merced County. Merced County has been significantly impacted by the economy. We have seen a significant decline in the number of customers investing in energy efficiency projects.

Major Program Changes

A large percentage of our energy efficiency savings have traditionally come from our large industrial customers. Those customers only make up approximately 15% of our customer base. We did not see the participation this year as we had in years past.

We have budgeted for all of our programs to be evaluated and new programs to be implemented. Our current lighting program would see the most significant change with the addition of LEDs. We anticipate with a slight change in economic factors and new program offerings; we can encourage customers to participate in implementing more energy efficiency measures. MID also has a marketing budget to help promote our programs.

Program Descriptions

- Commercial/Industrial Lighting Program: The Commercial Lighting Program is a turnkey lighting retrofit rebate program with a financial rebate menu for energy saving lighting equipment retrofits. The menu includes generous rebates for the replacement of T-12 lamps, Metal Halide Fixtures, Incandescent Lighting, and Exit Signs. The program also provides rebates for the addition of lighting controls including Photocells and Occupancy Sensors. We currently offer rebates for LED upgrades under our Customized Retrofit Program.
- Commercial/Industrial Mechanical Equipment Program: The Commercial/Industrial Retrofit Program is a turnkey mechanical equipment rebate program with a financial rebate menu for energy saving mechanical equipment retrofits. The menu includes generous rebates for the replacement of mechanical equipment with more energy efficiency equipment including: Refrigeration Equipment, Air Conditioning Equipment, Chillers, Motors, and Pumps. The program also provides rebates for Variable Frequency Drives on pumps, motors, and fans. Rebates are also available for Cooling Load Reduction measures to include Duct Sealing, Cool Roofs, Window Film, and Programmable Thermostats.

- Customized Commercial/Industrial Retrofit Program: The Customized/Industrial Retrofit Program enables qualifying commercial and industrial customers to apply for financial incentives on more specialized and comprehensive energy saving measures that do not fall under the Commercial Lighting Program or the Mechanical Equipment Retrofit Program. Applications for this program are evaluated and approved on an individual per application basis. Financial incentives for qualifying customer projects are paid for annual kilowatt hour savings in a one year period on approved projects.
- Residential Rebate Program: This program encourages residential customers to purchase EnergyStar® labeled products, home appliances and energy-efficient compact fluorescent light bulbs.
- Appliance Recycle Program: This program allows residential customers to receive a $35.00 rebate for recycling qualified refrigerators or freezers.

EM&V

Merced Irrigation District partnered with Modesto and Turlock into one evaluation effort for EM&V. The three Irrigation Districts of Modesto, Turlock, and Merced (MTM) are located in California's central valley near one another and each offer similar DSM programs.

Complimentary Programs

- Solar Incentive Program: The Solar Incentive Program provides financial incentives to qualifying customers to buy down installed solar generation projects and to help offset the customer's investment in renewable energy generation. The rebate incentive is equal to the estimated performance of the installed solar system multiplied by $1.00/wattAC. The rebate incentive for commercial/industrial solar systems are capped at $25,000 (25kW) and $3,000 (3kW) for residential.
- Residential Energy Assistance Program (CARE): Since 2000, MID has been providing a 20 percent discount on monthly energy bills for Low-Income Families, and the Medical Baseline and Life-Support Program for those who depend on electrically powered medical equipment.

MERCED IRRIGATION DISTRICT – FY 2014/2015 ENERGY EFFICIENCY RESULTS

Merced		Resource Savings Summary									Cost Summary			
Program Sector (Used in CEC Report)	Category	Units Installed	Gross Coincident Peak Savings (kW)	Gross Annual Energy Savings (kWh)	Gross Lifecycle Energy Savings (kWh)	Net Coincident Peak Savings (kW)	Net Annual Energy Savings (kWh)	Net Lifecycle Energy Savings (kWh)	Net Lifecycle Gas Savings (MMBtu)	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)	Utility ($/kWh)
Appliances	Res Clothes Washers	30		5,520	60,720		1,711	18,823		9	$2,250	$1,550	$3,800	$0.26
HVAC	Res Cooling	2		94	1,410		75	1,128		1	$2,350	$251	$2,601	$3.22
Appliances	Res Dishwashers	22		572	5,720		343	3,432		2	$1,650	$283	$1,933	$0.71
Consumer Electronics	Res Electronics													
HVAC	Res Heating													
Lighting	Res Lighting													
Pool Pump	Res Pool Pump													
Refrigeration	Res Refrigeration	33		5,828	59,416		4,080	41,591		23	$3,040	$4,596	$7,636	$0.24
HVAC	Res Shell													
Water Heating	Res Water Heating													
Comprehensive	Res Comprehensive													
Process	Non-Res Cooking													
HVAC	Non-Res Cooling													
HVAC	Non-Res Heating													
Lighting	Non-Res Lighting	1		19,447	136,129		15,558	108,903		60	$1,361	$13,840	$15,201	$0.17
Process	Non-Res Motors													
Process	Non-Res Pumps													
Refrigeration	Non-Res Refrigeration													
HVAC	Non-Res Shell													
Process	Non-Res Process	1		91,908	919,080		73,526	735,264		391	$6,434	$78,217	$84,651	$0.15
Comprehensive	Non-Res Comprehensive	1		76,046	760,460		60,837	608,368		339	$5,323	$74,184	$79,507	$0.17
Other	Other													
SubTotal		90	1	199,415	1,942,935		156,130	1,517,510		824	$22,408	$172,920	$195,328	$0.16
T&D	T&D													
Total		90	1	199,415	1,942,935		156,130	1,517,510		824	$22,408	$172,920	$195,328	

EE Program Portfolio	TRC Test	**0.44**
	PAC Test	**0.84**

Excluding T&D

MODESTO IRRIGATION DISTRICT

MID At a Glance

- Established in 1887; electric service began in 1923
- Entire service area is Climate Zone 12
- 118,000 active retail service connections/customers served
- Retail electric sales by customer class are: 35% residential; 29% commercial; 31% industrial; 4% agricultural and pumping; 1% other (based on GWH)
- $5.2 million budgeted for Energy Efficiency (EE) programs (including overhead); $3.66 million actually expended; under expenditure was due to lower customer participation (unused incentives); EE programs are funded by a combination of public benefits allocation and resource procurement; unused EE funds typically accrue to reserves (they cannot be reallocated to other Public Benefits programs without specific authorization by the Board)
- Load growth for 2015 was – 2% (based on Total System Input GWH)
- Other - MID's mission is to deliver superior value to irrigation, electric and domestic water customers through teamwork, technology, and innovation (www.mid.org)

MID Overview

MID electric sales have remained essentially "flat" over the past decade. The last major increase in energy sales occurred in 2004 (+3%) and significant reductions occurred in the recession years of 2009 and 2010 (-3% and -4%, respectively). Regarding capacity, MID hit an all time system peak in 2006 of 687 MW (controlled), whereas the peak for 2015 was only 652 MW (uncontrolled). Clearly, the economy in the central valley continues to affect MID and its customers, which in turn impacts EE program participation and results.

Another trend in the MID service area is a significant installation of leased solar systems, which require little or no out-of-pocket cost for the homeowner. The customer motivation for installing these systems includes high utility rates and the perceived certainty of reduced future electric bills. Installation of these systems has reduced system load growth and may also dampen residential customer interest in pursuing EE projects.

Major Program Changes

MID made no major changes to its EE programs in 2015. However, MID continues to make incremental modifications to its lighting programs to reflect changing codes and standards. MID maintained funding levels for EE programs consistent with its energy saving targets.

Industrial customers are the largest single variable on MID's EE program budgets and energy savings because they are large energy consumers and their energy projects tend to be substantial. Several industrial customers deferred projects scheduled for 2015, which contributed to overall program results that were well below the target.

Program Highlight

The number of rebates for pool pumps replacements increased this year. Due to the hot summers, many home owners in the Modesto area have installed swimming pools. In an effort to reduce their electric costs, an increasing number of pool owners are replacing their pool pumps with variable speed models, due in part to MID's pool pump rebate. Also, due to high demand and overall customer satisfaction, MID is budgeting more funds for low income weatherization programs in 2016.

Program Descriptions

MID offers incentive programs that cover a wide variety of energy efficiency measures. The common theme for these programs is for customers to be MPowered. The correlation between these program offerings and the Sector /Category classifications used in the summary table of the E3 reporting tool are shown below:

Program Sector	Category	Corresponding MID Program(s) Offered*
Appliances	Res Clothes Washers	MPower Home
HVAC	Res Cooling	MPower Home; Weatherization
Appliances	Res Dishwashers	NA
Consumer Electronics	Res Electronics	Weatherization
HVAC	Res Heating	NA
Lighting	Res Lighting	Weatherization
Pool Pump	Res Pool Pump	MPower Home
Refrigeration	Res Refrigeration	Mpower Home; Weatherization
HVAC	Res Shell	MPower Home; Weatherization
Water Heating	Res Water Heating	MPower Home; Weatherization
Comprehensive	Res Comprehensive	NA
Process	Non-Res Cooking	MPower Business: Custom
HVAC	Non-Res Cooling	MPower Business: Express & Custom
HVAC	Non-Res Heating	NA
Lighting	Non-Res Lighting	MPower Business: Express, Custom & New Construction
Process	Non-Res Motors	NA
Process	Non-Res Pumps	MPower Business: Custom
Refrigeration	Non-Res Refrigeration	MPower Business: Express & Custom
HVAC	Non-Res Shell	MPower Business: Custom & New Construction
Process	Non Res Process	MPower Business: Custom & New Construction
Comprehensive	Non Res Comprehensive	MPower Business: New Construction
Other	Other	MPower Business: Custom & New Construction

* see MID website (www.mid.org) for program details

EM&V

MID continued its ongoing efforts to obtain independent, third-party review of its EE programs. To that end, MID hired Power Services, Inc. (CMVP qualified) to perform M&V on selected 2015 projects - in conjunction with the rebate approval process - which included control systems, refrigeration and compressed air. In

2015, MID also collaborated with Turlock and Merced Irrigation Districts and will jointly hire Navigant Consulting to conduct EM&V on 2014 and 2015 EE programs. That study will be conducted in 2016. MID's annual budget for EM&V work is $75,000 and completed studies can be found at: http://www.ncpa.com/current-issues/energy-efficiency-reports.html

The independent studies have consistently found the Realization Rate for MID's EE program portfolio to be within a few percentage points of 100%. Those results demonstrate that MID is accurately reporting the savings from its EE programs. The accuracy of reporting is due in part to the quality assurance practices MID staff applies on an ongoing basis throughout the approval cycle of applications for its EE programs.

Sources of Energy Savings

MID offers two types of rebates: express and performance, which are based on deemed and calculated savings, respectively. The deemed savings for the express rebates are based on KEMA, DEER and IOU work paper data from the prior version of the E3 reporting tool (pre-TRM). The calculated savings for the performance rebates are based on ex-anti and ex-post data from the specific project.

In 2016, MID will continue transition to the TRM as the source for its deemed savings wherever possible. In some cases, that may necessitate changing the structure of the rebate to match the savings unit of TRM. For example, MID's residential AC rebates are per unit (same rebate for a 2 ton unit as a 5 ton unit) and the TRM savings units are per ton, so MID may revise its program to offer rebates that better align with the TRM.

Complimentary Programs

The formalization of Public Benefits programs came about through AB1890 (09/24/96), which defined four broad categories of public benefits programs, established a minimum funding level and codified the concept via Public Utilities Code section 385. While Energy Efficiency is the focus of this report, MID's activities in the three other public benefits categories, plus Electric Vehicles and Energy Storage, are briefly noted here:

- Renewable Energy Programs: MID's renewable energy programs are no longer funded from public benefits. Rather, they are conducted in accord with subsequent legislative or regulatory mandates, such as the Renewable Portfolio Standard (RPS) and the California Solar Initiative (CSI/SB1). To date, MID has procured enough renewable energy to satisfy the renewable energy trajectory that was established by the CEC for the three compliance periods through 2020, and is currently considering its options for meeting the newly established post-2020 targets.
- Low-Income Programs: MID's low income programs are comprised of weatherization, CARE rate discount and educational outreach. Energy savings from the weatherization program are included in the results for the SB1037 report. Customer demand for weatherization exceeds the annual amount budgeted and the rate discount alone represents a substantial portion of the total public benefits funding allocation. However, MID continues to facilitate new partnerships with other

organizations and agencies to increase its outreach and provide additional weatherization services to low-income customers.

- Research, Development and Demonstration Activities: MID remains open to partner with other utilities or agencies in opportunities to leverage the limited funding it can allocate to this program area.
- Energy Storage: In 2014, the MID board of directors adopted a policy determining that energy storage targets are not appropriate for MID. The district continues to evaluate the benefits that are applicable to the MID system and will consider updating this policy if warranted by operational and/or economic needs.

MODESTO IRRIGATION DISTRICT – FY 2014/2015 ENERGY EFFICIENCY RESULTS

Modesto		Resource Savings Summary									Cost Summary			
Program Sector (Used in CEC Report)	Category	Units Installed	Gross Coincident Peak Savings (kW)	Gross Annual Energy Savings (kWh)	Gross Lifecycle Energy Savings (kWh)	Net Coincident Peak Savings (kW)	Net Annual Energy Savings (kWh)	Net Lifecycle Energy Savings (kWh)	Net Lifecycle Gas Savings (MMBtu)	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)	Utility ($/kWh)
Appliances	Res Clothes Washers	185	29	11,470	137,640	25	9,750	116,994		59	$6,475	$1,659	$8,134	$0.09
HVAC	Res Cooling	464	129	107,647	1,893,817	106	87,689	1,536,264		946	$138,782	$61,801	$200,583	$0.19
Appliances	Res Dishwashers													
Consumer Electronics	Res Electronics	90		6,750	101,250		6,750	101,250		51	$8,903	$3,015	$11,917	$0.16
HVAC	Res Heating													
Lighting	Res Lighting	3,205	4	110,594	756,372	4	110,594	756,372		381	$44,011	$22,623	$66,634	$0.11
Pool Pump	Res Pool Pump	157	12	50,397	503,970	9	34,774	347,739		175	$31,400	$4,942	$36,342	$0.13
Refrigeration	Res Refrigeration	329	45	280,614	2,307,232	28	203,489	1,929,227		1,047	$131,224	$62,943	$194,167	$0.14
HVAC	Res Shell	989	238	184,506	3,105,236	160	119,665	1,942,588		1,096	$107,690	$48,622	$156,312	$0.12
Water Heating	Res Water Heating	52		6,411	79,178		5,502	66,148		35	$1,069	$1,644	$2,714	$0.06
Comprehensive	Res Comprehensive													
Process	Non-Res Cooking													
HVAC	Non-Res Cooling	1,119	115	1,078,540	16,178,100	92	862,832	12,942,480		7,869	$156,033	$196,280	$352,313	$0.04
HVAC	Non-Res Heating													
Lighting	Non-Res Lighting	769,757	560	3,034,433	39,068,201	448	2,427,538	31,254,431		17,321	$249,075	$299,959	$549,034	$0.02
Process	Non-Res Motors	3	689	3,410,406	51,156,090	551	2,728,325	40,924,872		21,764	$238,728	$266,373	$505,101	$0.02
Process	Non-Res Pumps													
Refrigeration	Non-Res Refrigeration	625,114	51	974,092	13,495,802	43	824,338	11,416,829		6,019	$154,699	$94,541	$249,240	$0.03
HVAC	Non-Res Shell	1,308		22,242	222,423		17,794	177,938		99	$1,308	$1,723	$3,031	$0.02
Process	Non-Res Process	9	732	8,704,044	130,560,660	586	6,963,235	104,448,528		55,545	$587,361	$732,490	$1,319,850	$0.02
Comprehensive	Non-Res Comprehensive													
Other	Other													
SubTotal		1,402,781	2,605	17,982,146	259,565,972	2,053	14,402,274	207,961,661		112,406	$1,856,759	$1,798,613	$3,655,372	$0.02
T&D	T&D													
Total		1,402,781	2,605	17,982,146	259,565,972	2,053	14,402,274	207,961,661		112,406	$1,856,759	$1,798,613	$3,655,372	

EE Program Portfolio	TRC Test	**2.27**
	PAC Test	**6.14**

Excluding T&D

MORENO VALLEY UTILITY

Moreno Valley Utility (MVU) At a Glance

- Moreno Valley Utility (MVU) began serving its first customers in February 2004
- Climate Zone: 10
- Number of retail customer connections: 5,952
- Percent of retail sales by customer class: 22% residential, 78% commercial & industrial
- $230,000 budgeted amount for energy efficiency and $256,300 for demand response programs. Actual expenditures were $132,000 for energy efficiency and $216,000 for demand response.

MVU Overview

Last fiscal year MVU experienced significant load growth, mainly due to economic development efforts to attract large commercial and industrial customers. In partnership with the City's Economic Development department, MVU created a new five-tier economic development rate that includes a jobs creation component and has made a positive impact on the community and local economy. As a result, peak demand has increased more than 20 percent to 39 megawatts from last year's report of 32 megawatts.

One of MVU's challenges to achieve its energy efficiency goals is that most customer buildings, both residential and commercial, are 10 years old or less. These facilities were built under recent Title 24 construction guidelines and are therefore inherently energy efficient. MVU will have to focus on creating innovative programs and new technology to achieve energy efficiency and conservation goals. As MVU increases electrical load, customer base, and revenue new energy efficiency programs will be created to give customers a greater opportunity to participate.

Major Program Changes

In the previous reporting period MVU utilized a third party direct install program to audit over 100 small businesses for energy efficiency opportunities but the effort yielded mixed results. Due to the already efficient buildings, there were few customers able to participate in the direct install component of the program. As a result, MVU has implemented or enhanced many commercial programs and is in the process of creating its residential efficiency programs to provide greater energy savings opportunities.

Program Descriptions

MVU offers many programs to commercial customers:

- New Construction and Major Tenant Renovation: this program offers incentives for projects exceeding Title 24 by at least ten percent. Eligible customers are responsible for providing documentation of energy savings using energy modeling software and all calculations must be signed by a licensed mechanical engineer.
- Commercial Energy Efficiency Program: this Direct Install program provides small to medium-sized customers with an onsite energy audit and energy saving measures at no cost to the customer.

- Lighting Retrofits: rebates are available to commercial customers for LED lighting retrofits, other energy efficient lighting replacements, and for LED or photo-luminescent exit signs.
- Commercial Heating, Ventilation and Air Conditioning (HVAC) Retrofits: customers that install new high SEER HVAC units or replace older inefficient units can participate in this rebate program. The installation of new chillers that exceed Title 24 requirements or load-shifting Thermal Energy Storage (TES) systems may also qualify for rebates.
- Motor Replacements: commercial customers that install premium efficiency motors are eligible for rebates under this program. Motors covered under this program must be new, three-phase induction motors (1hp to 200hp in size) and operate for at least 2,000 hours per year.
- Outreach Programs: The utility contracts with Automated Energy to provide medium to large sized commercial customers with detailed usage information to help them efficiently manage their energy consumption.

EM&V

Engineering analysis programs, such as DOE-2, are the basis for calculated energy savings and incentive calculations. MVU requires both pre-inspections and post-inspections for all projects that result in a rebate over $5000. As energy efficiency programs evolve and participation levels increase MVU will contract with one of the preferred service providers to create an EM&V plan.

Sources of Energy Savings

MVU relied primarily on the TRM values from the E3 model but also used reported energy savings from trusted engineering contractors to calculate program performance.

- Commercial Codes & Standards – MVU has recorded its share of the energy savings that are attributable to the State's Building Codes and Appliance Standards (Title-24) that are applied and enforced by the City of Moreno Valley.

Complimentary Programs

- Renewable Energy Programs: The Solar Incentive Program was extremely successful having expended nearly $1.1M to provide rebates for 141 solar projects. The results were over 700 kilowatts installed with an annual estimated production of more than 1.2 megawatt hours.
- Low-Income Programs: MVU's Low-Income Assistance program provides qualified low-income residents with a 20% discount on monthly energy charges; this year's expenditures were over $55,000.
- Research, Development, and Demonstration: MVU has 15 Ice Bear thermal energy storage (TES) systems installed at various city and customer locations, having added four new units this reporting year to the Moreno Valley Pet Shelter. These installations serve as a demonstration of load-shifting technology and may also serve as a Demand Response opportunity in the future.
- Electric Vehicles: The installation of level 2 and level 3 public electric vehicle charging stations are planned for a Walmart parking lot and for the City Hall campus, utilizing CEC and SCAQMD grants.

MORENO VALLEY UTILITY – FY 2014/2015 ENERGY EFFICIENCY RESULTS

Moreno Valley		Resource Savings Summary									Cost Summary			
Program Sector (Used in CEC Report)	Category	Units Installed	Gross Coincident Peak Savings (kW)	Gross Annual Energy Savings (kWh)	Gross Lifecycle Energy Savings (kWh)	Net Coincident Peak Savings (kW)	Net Annual Energy Savings (kWh)	Net Lifecycle Energy Savings (kWh)	Net Lifecycle Gas Savings (MMBtu)	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)	Utility ($/kWh)
Appliances	Res Clothes Washers													
HVAC	Res Cooling													
Appliances	Res Dishwashers													
Consumer Electronics	Res Electronics													
HVAC	Res Heating													
Lighting	Res Lighting													
Pool Pump	Res Pool Pump													
Refrigeration	Res Refrigeration													
HVAC	Res Shell													
Water Heating	Res Water Heating													
Comprehensive	Res Comprehensive													
Process	Non-Res Cooking													
HVAC	Non-Res Cooling	14		2,341	35,115	40	1,990	29,848		216	$87,636	$1,944	$89,580	$0.14
HVAC	Non-Res Heating													
Lighting	Non-Res Lighting	637	152	686,473	6,864,730	152	686,473	6,864,730		4,066	$111,336	$10,031	$121,367	$0.02
Process	Non-Res Motors													
Process	Non-Res Pumps													
Refrigeration	Non-Res Refrigeration	36	2	17,670	241,140	1	10,602	144,684		81	$1,335	$175	$1,510	$0.01
HVAC	Non-Res Shell	1	72	451,120	451,120	72	451,120	451,120		274		$742	$742	
Process	Non-Res Process													
Comprehensive	Non-Res Comprehensive	1	1	6,434	64,340	1	6,434	64,340		39	$2,054	$108	$2,162	$0.04
Other	Other													
SubTotal		689	228	1,164,038	7,656,445	267	1,156,619	7,554,722		4,676	$202,361	$13,000	$215,361	$0.03
T&D	T&D													
Total		689	228	1,164,038	7,656,445	267	1,156,619	7,554,722		4,676	$202,361	$13,000	$215,361	

EE Program Portfolio	TRC Test	**2.85**
	PAC Test	**5.02**

Excluding T&D

Needles At a Glance

- The City of Needles Public Utilities Department was established in 1982.
- Needles is located in Western Area Power Authority Administration control area and is not part of the CAISO grid.
- Needles has 2,840 meters, serving 2,478 residential customers, 432 commercial customers, 37 commercial demand customers, and 4 master metered and 1 municipal customers.
- Total energy sales are 53,075,909 kilowatt-hours (FY 2014-15); 47 percent is residential sales, 53 percent is commercial and the remainder is master metered and municipal sales
- Approximately 55% of Needles power comes from hydroelectric
- Peak demand is 19.1 megawatts

Needles Overview

Needles is an extreme summer peaking utility. Summer temperatures (late June through early September) can reach 130 degrees, and daytime temperatures range from minimum temperatures in the mid-90s with afternoon temperatures between 100 and 120 degrees.

On an annual basis, Needles' load factor is less than 37 percent. The Needles City Council approved Resolution No. 7-24-07 1 on July 24, 2007 adopting the provisions of California Assembly Bill 2021 – *Public Utilities Energy Efficiency.* The budget amount of $150,000.00 adopted for the program was based upon the Rocky Mountain Institute's analysis *" to identify all potentially cost-effective electricity efficiency savings and establish annual targets for energy efficiency savings and demand reduction for the next 10-year period"*

Program Highlight

The City of Needles' energy efficiency programs are designed to reduce the summer air conditioning loads and increase the annual load factor. In FY 2013-14, the City of Needles' energy efficiency programs reduced peak demand by 185 kilowatts and 185,159 kilowatt-hours Western Area Power Authority approved California 2013 Minimum Investment Report ("MIR")

*T*he kilowatt savings are derived from the number of hours that air conditioners are used in Needles (essentially all hours when temperature is greater than 90 degrees – April through October).

At FYE 6/30/2013 the total combined residential and commercial usage was 54,870,481 kilowatt hours. At FYE 6/30/15, the combined residential and commercial usage was 53,075,909 kilowatt hours, a decrease of 1,794,572 kilowatt hours or 3.27%.

The City of Needles will continue to budget $150,000 annually for the existing energy efficiency programs and will allocate additional funding if customer demand is greater than the program allocation. The $150,000.00 is funded by ratepayers via a line item on their electric bill (*Mandated Conservation* at

$0.0035/kWh). The prerequisite for eligibility for the energy efficiency program (City pays for 14 or higher SEER rated air conditioners, evaporative coolers and refrigerators) is that the rate payer's apply for weatherization through the San Bernardino Community Action Coalition ("HEAP"). Needles budgeted $50,000 for solar programs beginning in FY 2011/12.

The City augments its Mandated Conservation funding with 25% landlord participation on equipment cost where installation is a leasehold improvement to landlord's property. Tenant and landlord must agree to apply for weatherization through San Bernardino Community Action Partnership ("SBCAP") which organization means tests the tenant for eligibility for weatherization. If SBCAP approves the tenant for weatherization, the tenant is approved for a new air conditioner.

Program Descriptions

- Air Conditioning Rebate Program: Provides installation support and financial rebates to facilitate upgrades to more efficient lighting and air conditioning systems.
- Sun Shade Program: Provides rates for the installation of residential sun shades, designed to lower house temperatures during the summers

CITY OF NEEDLES – FY 2014/2015 ENERGY EFFICIENCY RESULTS

Needles		Resource Savings Summary									Cost Summary			
Program Sector (Used in CEC Report)	Category	Units Installed	Gross Coincident Peak Savings (kW)	Gross Annual Energy Savings (kWh)	Gross Lifecycle Energy Savings (kWh)	Net Coincident Peak Savings (kW)	Net Annual Energy Savings (kWh)	Net Lifecycle Energy Savings (kWh)	Net Lifecycle Gas Savings (MMBtu)	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)	Utility ($/kWh)
Appliances	Res Clothes Washers													
HVAC	Res Cooling	25	8	17,050	189,236	6	13,640	151,389		96	$166,384		$166,384	$1.54
Appliances	Res Dishwashers													
Consumer Electronics	Res Electronics													
HVAC	Res Heating													
Lighting	Res Lighting													
Pool Pump	Res Pool Pump													
Refrigeration	Res Refrigeration													
HVAC	Res Shell													
Water Heating	Res Water Heating													
Comprehensive	Res Comprehensive													
Process	Non-Res Cooking													
HVAC	Non-Res Cooling													
HVAC	Non-Res Heating													
Lighting	Non-Res Lighting													
Process	Non-Res Motors													
Process	Non-Res Pumps													
Refrigeration	Non-Res Refrigeration													
HVAC	Non-Res Shell													
Process	Non-Res Process													
Comprehensive	Non-Res Comprehensive													
Other	Other													
SubTotal		25	8	17,050	189,236	6	13,640	151,389		96	$166,384		$166,384	$1.54
T&D	T&D													
Total		25	8	17,050	189,236	6	13,640	151,389		96	$166,384		$166,384	

EE Program Portfolio	TRC Test	**0.77**
	PAC Test	**0.15**

Excluding T&D

CITY OF PALO ALTO UTILITIES

City of Palo Alto Utilities (CPAU) At a Glance

- Established:1896
- Only municipal utility in California that provides electric, natural gas, water, commercial fiber optics, wastewater collection and treatment and storm drain services to their customers.
- California Climate Zone: 4
- Meters: 29,500 electric, 23,800 gas and 20,380 water
- Percentage of electric retail sales by customer class:
    - Residential 19%
    - Commercial 59%
    - Industrial 22%
- Electric customer base: 90% residential, 9% commercial, and less than 1% industrial
- Electric efficiency program spending:
    - Budgeted (FY 2015): $4.98 million
    - Actual (FY 2015): $2.43 million
    - Source of funding: 2.85% of sales revenue set aside for public benefit plus supply funds
- Net electric efficiency goal for FY 2015: 0.60% of total sales
- Net electric efficiency achieved in FY 2015: 0.65% of total sales (excluding T&D savings)
- Average projected electric load growth per year (2016-2026): 0.1%

Utility Overview

CPAU has implemented a variety of energy efficiency programs since the 1970s. In 1998, in response to California's landmark energy legislation (AB 1890), CPAU established the Electric Public Benefits (PB) Program and increased the Electric PB program budget to 2.85 percent of projected annual revenue, supplemented by an infusion from the Electric Supply funds during the 2001 energy crisis. Since 2008, CPAU's annual electric efficiency program budget has been supplemented with supply funds as needed, in order to meet the state's mandate that publicly owned electric utilities, in procuring energy shall first acquire all available energy efficiency and demand reduction resources that are cost effective, reliable, and feasible.

CPAU is committed to supporting environmental sustainability through efficient consumption of electric, gas and water resources, promoting distributed renewable generation, and modifying consumer demand through incentives and education. In March 2013, Palo Alto City Council approved a Carbon Neutral Plan for the Electric Supply Portfolio committing CPAU to using carbon neutral electric supplies beginning in 2013.

Program Descriptions and Highlights

FY 2015 was a year of efficiency program transition for CPAU. Many EE programs were initiated, extended or terminated. This resulted in more staff time focused on finalizing contracts and program

startup. Despite using a smaller percentage of our EE budget, we still exceeded our electric efficiency goal.

Commercial Programs:

- Commercial Advantage Program (CAP): Incentives offered to commercial customers for investments in efficiency lighting, motors, HVAC and custom projects that target peak demand and energy reductions. In FY 2015, CAP recorded a net annual electric savings of 903,005 kWh.
- Commercial and Industrial Energy Efficiency Program (CIEEP) is managed by Enovity, Inc. This program assists commercial and industrial customers by helping them evaluate and implement energy efficiency projects. In FY 2015, CIEEP recorded net annual electric savings of 1,778,240 kWh.
- RightLights+ is an ongoing program focusing on energy efficiency savings from lighting retrofits. In FY 2015, RightLights+ recorded net annual electric savings of 1,183,059 kWh.
- Hospitality program helps hotels (and later extended to common areas of multi-family complexes) implement energy efficiency measures such as key card entry, LED lighting, insulation upgrades and HVAC equipment improvements In FY 2015, the Hospitality program recorded net annual electric savings of 37,578 kWh. Approximately 75% of the savings were attributed to multi-family measures.
- Business New Construction (BNC) provides incentives to customers who construct new buildings which save 20% or more than mandated by California Title 24 requirements. Customer projects going through the BNC program have a long lead time starting with the project design phase and ending after construction and commissioning is completed. During FY 2015, only one BNC project was completed with net annual electric savings of 402,135 kWh.

Residential Programs:

- Smart Energy is a comprehensive energy efficiency incentive program for residential customers to promote shell improvements, high efficiency HVAC equipment, pool pumps, appliances and lighting. In FY 2015, Smart Energy achieved net annual electric savings of 43,112 kWh.
- Residential Energy Assistance Program (REAP) provides weatherization and equipment replacement services to low-income residents and those with certain medical conditions. This program has equal focus on efficiency as well as comfort, and therefore is not cost effective. In FY 2015, REAP recorded net annual electric savings of 55,527 kWh. Starting FY 2014, the program began installing high-efficiency mini-split air source heat pumps for residents that previously had no heating. Approximately 40% of the program savings were attributed to multi-family measures
- Home Energy Report provides Palo Alto residents with individualized reports comparing their home energy use with neighbors in similarly sized homes. Approximately 20,000 residents receive the Home Energy Report by mail once every quarter. In FY 2015, the Home Energy Report recorded annual electric savings of 1,604,272 kWh.
- New Residential Construction program provides incentives to customers who build new homes which save 20% or more energy than mandated by California Title 24 requirements. Due to changes in building codes, this program is now closed. However, we are still processing

applications received prior to July 2014. In FY 2015, the New Residential Construction program recorded net annual electric savings of 14,871 kWh.

- Appliance Recycling provides residents an option to have old, energy intensive refrigerators and freezers responsibly recycled. In FY 2015, 96 units were recycled for a total of 41,622 kWh net annual electric savings.
- In April 2014, CPAU announced its intent to compete for the Georgetown University Energy Prize, a national competition that aims to challenge communities across the U.S. to dramatically rethink their energy use. On January 14, 2015, CPAU was selected as one of the 50 communities in the U.S. leading the way on energy efficiency. The competition stretches over a two year period, ending December 2016, with a $5 million prize to be awarded to the winner of the competition.

Community Resource Education Programs:

CPAU offers free residential energy efficiency advice and energy education programs to the community. Activities include hosting commercial Facility Manager Meetings for key account customers, residential energy workshops, participation in Chamber of Commerce meetings, neighborhood association events, local fairs and special events.

Public School Program:

CPAU provides an annual grant of up to $50,000 to the Palo Alto Unified School District (17 schools with 12,000 students total) to support teacher training programs and the development of curriculums and education projects promoting energy and water efficiency. CPAU participates in monthly sustainable schools committee meetings and give educational presentations to classes on energy efficiency, renewable energy, and safety.

Complimentary Public Benefits Programs

Customer-side Renewable Generation:

- PV Partners and Solar Hot Water Heating Programs: CPAU offers rebates to customers who install solar electric (photovoltaic) or solar water heating (SWH) systems. Both programs are governed by state law in regard to development, implementation and administration. The funding for residential PV rebates was fully reserved by August 2014, but funds for commercial PV rebates are expected to remain available into FY 2016. These customer-side generation systems are not included in the Utility's Renewable Portfolio Standard (RPS) supply requirements.
- CPAU participated in Peninsula SunShares, a regional solar group-buy effort led by the City of Foster City launched in April 2015 and closed on June 30, 2015. Solar group-buy programs have been successful in driving down system costs by aggregating purchasing power and simplifying the process of solar adoption. This program resulted in over 800 kW in new solar installations across the Bay Area. Fifty-four Palo Alto residents signed contracts to install 236 kilowatts (kW) of solar systems. CPAU is currently developing a community solar program, which typically enable an electric utility's customers to buy or lease solar panels in a centralized solar PV array and receive regular credits for electric output via their utility bills.

Customer-sited, Utility-interconnected Renewable Generation:

- The Palo Alto CLEAN (Clean Local Energy Accessible Now) program offers a feed-in tariff for commercial sized PV systems installed on the utility-side of the electric meter where all of the generated electricity is procured for use in Palo Alto's Renewable Portfolio Standard (RPS). For fiscal year 2015, the price is 16.5 ¢/kWh fixed for 20 or 25 years for solar renewable energy resources, and 9.3 c/kWh for a 20-year contract term and 9.4 c/kWh for a 25-year contract term for non-solar eligible renewable energy resources.

Research, Development & Demonstration:

- The Customer Connect pilot program uses advanced meters to help residential customers evaluate changes in their energy and water use and view their consumption through an online portal. This program has 375 customers participating, of which up to 150 will be on a time-of-use (TOU) electric rate schedule. The pilot is scheduled to continue through 2016.
- Program for Emerging Technologies (PET): CPAU launched this program in 2012 to partner with individuals and companies who want to evaluate, test and implement innovative emerging technologies. The goal is to find and nurture creative products and services that will manage and better use electricity, gas, water and fiber optic services. For example, in FY2015, CPAU completed an evaluation report for an advanced lighting system pilot project in the Palo Alto City Hall parking garage as well as evaluations for a pilot project carried out in FY2015 that integrated distributed solar energy mounted on City light poles.

Demand Reduction Pilot:

- CPAU's Demand Response (DR) pilot program offers incentives to large commercial customers to voluntarily reduce their electricity use during periods of high demand in the summer months. The program is coordinated with third-party vendor, Autogrid, providing DR-related communications to customers as well as calculating the financial incentives based on the customer's load reduction. Over the last 3 years, this program has become an integral part of CPAU's effort to reduce the reliance on fossil fuel generation and to lower purchase cost. CPAU is planning to continue this program beyond FY 2015.

Transmission and Distribution:

- Transmission and distribution savings of 796,157 kWh were the result of an electrical system upgrade project and streetlight conversions of HPS lamps to LED.

Evaluation, Measurement & Verification

For FY 2015, CPAU contracted with TRC Engineers to undertake impact and process evaluation for the Commercial Advantage Program, RightLights+ Program, CIEEP (Enovity), Business New Construction program and the Appliance Recycling Program. A final EM&V report is expected to be available by March 2016.

Below are the tables of the energy efficiency savings results by program and sector for FY 2015.

FY14-15 EE Program Results

Resource Savings Summary								Cost of Efficiency	
	Units Installed	Gross Coincident Peak Savings	Gross Annual Energy Savings (kWh)	Gross Lifecycle Energy Savings (kWh)	Net Coincident Peak Savings (kW)	Net Annual Energy Savings (kWh)	Net Lifecycle Energy Savings (kWh)	Utility ($/kWh)	Total Resource ($/kWh)
TOTAL EE PORTFOLIO	**1,158,603**	**982**	**7,988,498**	**85,136,136**	**827**	**6,859,651**	**70,884,349**	**0.05**	**0.09**
COM-Com. Advantage	1,095,348	6	1,128,756	9,217,183	5	903,005	7,373,746	0.03	0.04
COM-Right Lights	48	303	1,478,824	22,182,361	243	1,183,059	17,745,889	0.06	0.07
RES-Home Energy Report	57,221		1,604,272	1,604,272		1,604,272	1,604,272	0.05	0.05
RES-REAP Low Inc	2,454		69,409	805,610		55,527	644,488	0.06	0.06
RES-Smart Energy	1,106		92,831	1,054,909		43,112	474,393	0.10	0.18
GEN-Gen T&D	2,291	191	796,157	12,717,323	191	796,157	12,717,323	0.01	0.15
COM-SCVWD	1		91	1,001		73	801	0.33	0.67
COM-Enovity	17	422	2,222,800	30,825,400	337	1,778,240	24,660,320	0.05	0.10
COM-Hospitality	1	60	44,209	530,508	51	37,578	450,932	0.48	0.48
COM-ERS									
RES-New Construction	19		18,589	223,068		14,871	178,454	0.33	0.33
COM-Business New Construction	1		473,100	5,677,200		402,135	4,825,620	0.05	0.10
RES-Refrigerator Recycling	96		59,460	297,300		41,622	208,110	0.11	0.10

CITY OF PALO ALTO UTILITIES – FY 2014/2015 ENERGY EFFICIENCY RESULTS

Palo Alto		Resource Savings Summary									Cost Summary			
Program Sector (Used in CEC Report)	Category	Units Installed	Gross Coincident Peak Savings (kW)	Gross Annual Energy Savings (kWh)	Gross Lifecycle Energy Savings (kWh)	Net Coincident Peak Savings (kW)	Net Annual Energy Savings (kWh)	Net Lifecycle Energy Savings (kWh)	Net Lifecycle Gas Savings (MMBtu)	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)	Utility ($/kWh)
Appliances	Res Clothes Washers	239		52,102	573,122		16,152	177,668			$29,875	$1,281	$31,156	$0.22
HVAC	Res Cooling	3		301	4,320		84	1,210			$100	$18	$118	$0.13
Appliances	Res Dishwashers													
Consumer Electronics	Res Electronics													
HVAC	Res Heating	40		3,023	29,059		2,395	22,890			$200	$1,028	$1,228	$0.07
Lighting	Res Lighting	2,713		73,246	731,884		58,597	585,507			$60	$20,962	$21,022	$0.04
Pool Pump	Res Pool Pump	6		10,266	102,660		6,160	61,596			$800	$448	$1,248	$0.03
Refrigeration	Res Refrigeration	126		65,310	379,200		45,932	268,443			$4,660	$18,367	$23,027	$0.10
HVAC	Res Shell	548		36,041	560,642		25,814	388,131			$47,017	$9,748	$56,765	$0.20
Water Heating	Res Water Heating													
Comprehensive	Res Comprehensive	57,221		1,604,272	1,604,272		1,604,272	1,604,272				$71,068	$71,068	$0.05
Process	Non-Res Cooking													
HVAC	Non-Res Cooling	72	425	2,242,525	31,121,275	340	1,794,020	24,897,020			$227,780	$680,134	$907,914	$0.05
HVAC	Non-Res Heating													
Lighting	Non-Res Lighting	1,095,340	304	2,552,898	30,579,314	244	2,042,318	24,463,451			$283,522	$610,818	$894,340	$0.05
Process	Non-Res Motors													
Process	Non-Res Pumps													
Refrigeration	Non-Res Refrigeration													
HVAC	Non-Res Shell													
Process	Non-Res Process	2	1	35,048	525,356	1	28,038	420,285			$8,939	$13,131	$22,070	$0.07
Comprehensive	Non-Res Comprehensive	2	60	517,309	6,207,708	51	439,713	5,276,552			$258,867	$79,169	$338,036	$0.08
Other	Other													
SubTotal		1,156,312	790	7,192,341	72,418,812	635	6,063,494	58,167,025			$861,820	$1,506,172	$2,367,993	$0.05
T&D	T&D	2,291	191	796,157	12,717,323	191	796,157	12,717,323				$111,342	$111,342	
Total		1,158,603	982	7,988,498	85,136,136	827	6,859,651	70,884,349			$861,820	$1,617,515	$2,479,335	

EE Program Portfolio	TRC Test	**1.16**
	PAC Test	**1.79**

Excluding T&D

PASADENA WATER & POWER

Pasadena Water & Power (PWP) At a Glance

- Established: 1906
- Climate Zone: 9
- Service Territory Population: 141,510 (Source: California Department of Finance, January 2015)
- Retail sales: 1,129.6 GWh ($199,984,672)
    - Residential connections: 56,645 (29.0% of retail sales)
    - Commercial & Industrial connections: 8,914 (59.8% of retail sales)
    - Other: 11.2% of retail sales
    - 8.6% increase in retail sales revenue versus FY 2013/14, due to a rate increase
- Budget for energy-efficiency programs:
    - $2,785,102 expended (includes administration and program marketing costs)
    - Funding Source: Public Benefits Charge ("PBC") as authorized under Public Utilities Codes 385(1) funds all AB1890 programs (current PBC revenue rate = $0.00685 per kWh)
    - Energy-efficiency programs (rebates, services, direct install, marketing, administration, and program evaluation, measurement and verification) represent approximately 40% of Pasadena's PBC expenditures. Solar incentive program represents 46%, Research Development and Demonstration (RD&D) represents 1%, and income-qualified rate assistance represents 13%.

PWP Overview

Trends in the utility and the local community which impact energy-efficiency programs include:

- Pasadena's local economy continues to show signs of renewed growth, with increased retail sales, more travel, lower unemployment rates and continued upswing in the residential and commercial real estate markets.
- New power rates became effective July 1, 2014, with future rate increases approved for 2015 and 2016.
- In light of the ongoing severe draught in California, PWP has been focused on community outreach and awareness and creating innovative solutions for improving water efficiency and reducing customer water use.
- Aggressive energy-efficiency and demand reduction goals, adopted in 2013 by Pasadena's City Council, combined with other changes in the market (e.g., new codes and standards) have continued to lead to flat energy load projects in the future.

Major Program Changes

Major changes to the PWP energy-efficiency programs during FY2014/15 program year include:

- Launched an LED WebShop that offers residential customers a convenient way to purchase a range of LED light bulbs at a discounted price that reflects PWP's buy down.

- Added new measures and increased incentive levels in the Residential Rebate Program (marketed as "Home Energy Rewards") to expand offerings and boost program participation.
- Expanded the Home Energy Reports (HER) from 25,000 customers in the last reporting cycle, to over 40,000.
- Formalized a new partnership with SoCalGas® through an Interagency MOU signed in June 2015. PWP is adding new programs under this MOU, including an income-qualified Energy Savings Assistance Program, which will be reported beginning in the next FY2015/16 reporting period.

Our programs also faced some challenges. In particular, PWP saw a very significant reduction in the energy savings from non-residential lighting, largely attributed to the Title 24 building code. PWP's small business direct install program ("WeDIP") also had fewer participants than in years past, due mainly to unforeseen challenges with one of the program's implementers that PWP is working to address.

Program Results and Highlights

In summary, below are the FY 2014/15 energy savings results by customer type (also see Tables 1 and 2 below):

Residential: 6,770 MWh
Non-Residential: 6,587 MWh
T&D and C&S: 4,430 MWh
Total: 17,787 MWh

Table 1: PWP Energy Efficiency Program Results (by program)

	Units Installed	Net Coincident Peak Savings (kW)	Net Annual Energy Savings (kWh)	Net Lifecycle Energy Savings (kWh)	Utility Incentives ($)
TOTAL EE PORTFOLIO	**53,708**	**1,875**	**17,786,825**	**139,479,365**	**$ 2,407,251**
Residential Rebate Program	14,294	73	189,701	1,833,544	$ 120,514
Home Energy Reports	1		5,695,083	5,695,083	$ 372,500
Residential Audits	243	13	33,488	33,488	$ 22,745
Residential Giveaways	38,631	74	726,784	11,229,274	$ 586,967
T&D	1	39	345,144	10,354,320	$ 0
C&S	1	650	4,085,060	4,085,060	$ 0
Commercial Rebates (EEP and PEER)	51	734	5,572,187	94,538,928	$ 773,096
Commercial Direct Install WeDIP	144	270	1,014,651	10,911,507	$ 402,314
Low Income Refrigerator Exchange	342	21	124,727	798,160	$ 129,115

Energy efficiency program with the greatest impacts:

- Energy Efficiency Partnering Program ("EEP") (5,572 MWh savings): Commercial efficiency incentive program providing customers with customized incentives to encourage energy saving and load reduction projects.
- Home Energy Reports (5,695 MWh savings): Originally launched in June 2011, the Home Energy Reports PWP program completed its fourth year. In FY 2014/15, four printed reports were mailed

to over 40,000 customers, reminding them of efficiency and rankings to encourage reductions in their energy usage; savings are tracked from actual metered data; no cost to participant.

- Water & Energy Direct Install Program ("WeDIP") (1,015 MWh savings): Small businesses direct install program to conduct retrofits for lighting, plumbing and refrigeration; no cost to participant.

Program Descriptions

PWP provides summaries of major programs by the associated sector-category classifications used in the E3 Reporting Tool.

- Residential Lighting
    - PWP's new LED WebShop enables residential customers to purchase LED light bulbs online at a lower-cost, reflecting a $5 per light bulb buy down from PWP.
    - To raise awareness about the new LED WebShop, PWP mailed each PWP resident a free LED bulb in 2015, with additional information about the WebShop and PWP's other water and energy incentives.
    - As part of the residential distributions and giveaway activities, PWP provides vouchers for efficient light bulbs upon request as well as a reward for participating in income-qualified rate assistance, electric vehicle and refrigerator recycling programs
- Residential Refrigeration:
    - PWP provides rebates for the purchase of new ENERGY STAR refrigerators through the Residential Rebate Program and also provides new ENERGY STAR refrigerators at no cost to income-qualified customers. In addition, PWP provides a rebate to encourage customers to remove and recycle older refrigerators and freezers, to reduce their energy bill and lessen the impact that these older appliances have on the grid, and to ensure units are recycled in a safe and environmentally-responsible manner.
- Residential Pool Pump
    - PWP's Residential Rebate Program provides rebates for the purchase of variable speed pool pumps.

- Residential Cooling
    - PWP's Residential Rebate Program provides prescriptive rebates for the installation of efficient air conditioning equipment (central AC/HP, window air conditioners, and mini/multi splits), as well as related shell improvement measures such as insulation, solar attic and whole house ventilation fans, cool roof, skylights/windows, window films, sun shade screens, and shade trees.
- Residential Comprehensive
    - Home Energy Reports mailed to over 40,000 customers, reminding them of efficiency and rankings to encourage reductions in their energy usage; savings are tracked from actual metered data.

- Non-Residential Lighting, Refrigeration, Shell and Cooling
    - PWP's non-residential EEP program provides custom incentives to business customers. The WeDIP program, designed to serve small businesses provides no-cost audits and direct installation of lighting equipment, as well as refrigeration and water saving measures.
- Non-Residential Pumps
    - PWP's water efficiency programs saved 257 acre-feet, resulting in 972 MWh annual energy savings (shown on the E3 as "Non-Res Pumps"); PWP's PBC Fund provides a rebate to PWP's Water Conservation Fund for the value of these savings.
- T&D Efficiency
    - Distribution system upgrades, including the conversion of 2.8 miles of circuits from 4kV to 17 kV and transformer replacements, yielded energy savings of 345 MWh.
- Other
    - Under Codes and Standards ("C&S"), PWP has 4,085 MWh and 650 kW of energy and peak demand savings that are occurring in our service territory due to the State building codes that are encouraged and enforced by the City's Building Department and appliance standards.

Evaluation, Measurement and Verification (EM&V)

PWP expended $89,481 on energy efficiency program EM&V to justify program design, expenditures and verify results:

- Residential Rebate Program: Contractors performed site verifications on 10% of all residential energy-efficient equipment purchases and installations, and on 100% of refrigerator/freezer recycling and refrigerator exchange program participants. PWP staff also conducted a survey, with questions developed by a 3rd party consultant, to ascertain the installation rate from the residential LED light bulb mailer.
- Non-Residential Programs:
    - EEP Program: Utility staff and contractors performed pre-and post-installation equipment and installation verification, on site, for 100% of customer projects.
    - Of the 42 non-residential custom projects completed, all had an independent engineering analysis conducted by a PWP engineering consultant ☐
        - Mechanical Equipment Retrofits: PWP's engineering contractor calculated energy savings and demand reduction using accepted engineering analysis such as DOE's eQuest building modeling software and the DOE Motor Master.
        - Lighting: Engineer-certified Excel workbook used to calculate lighting retrofit project energy savings based on the actual hours of operation.
        - Data Loggers: Data loggers and CT's were occasionally used to verify operating hours and equipment savings. All mechanical projects and a majority of lighting projects had both pre- and post-inspections.

- WeDIP Program: All water and energy direct install projects completed were pre- and post-inspected.

Sources of Energy Savings

PWP relies on the POU TRM data, where available, supplemented by best available technical data from independent engineering analysis where TRM measures are not yet available. For commercial programs, as discussed above, PWP relies on independent engineering analysis conducted by PWP's engineering consultant and industry models (e.g., DOE's eQuest building modeling software). The EEP program provide commercial customers with the ability to participate with any proven technology that saves energy, provided it meets the program requirements and the energy savings can be demonstrated.

Complimentary Programs

- Renewable Energy Programs: PWP's Pasadena Solar Initiative ("PSI") aims to install 14 MW of customer owned solar photovoltaic by December 31, 2017 in line with Senate Bill 1, California's "Million Solar Rooftops" initiative. PWP offers incentives to encourage customers to install solar photovoltaic systems on their home or business. PSI incentives are paid upfront through an Expected Performance Based Buydown ("EPBB") for smaller systems, whereas all systems larger than 100 kilowatts ("kW") are now paid over two-years based on metered output through a Performance Based Incentive ("PBI"). PWP also offers a Green Power Program, where customers can opt to pay a premium (2.5 cents/kWh) on their electricity bill for clean, renewable power. This program is open to both residential and commercial customers.

  As part of the 2015 PWP Integrated Resource Plan, approved by City Council in June 2015, PWP committed to support local renewable energy resources and community solar efforts by launching a Community Solar pilot project and establishing a feed-in tariff by the end of 2016.
- Low-Income Programs: PWP has offered electric rate assistance programs to eligible low income seniors or disabled customers for several decades. The current Electric Utility Assistance Program ("EUAP") was authorized by the City Council on March 6, 2006 and became effective July 1, 2006. The EUAP provides monthly assistance to low income, seniors, and medically-qualifying customers. Project APPLE ("Assisting Pasadena People with Limited Emergencies" provides a one-time utility bill payment assistance of up to $100 per year. Funding is provided through donations from PWP customers as well as PBC revenues.

  In addition, PWP in partnership with other City departments offers the Under One Roof program to income qualified customers which offers, low-to-no interest loans, exterior house painting, wheel chair ramps, weatherization services, ENERGY STAR refrigerators, solar energy systems, and turf replacement to drought tolerant landscapes, free of charge.
- Research, Development, and Demonstration: Throughout the years PWP has invested resources in a variety of different RD&D projects. This year, PWP continued to focus its support on Plug-in Electric Vehicle ("EV") development by providing funding of City fleet electric vehicles. PWP along with other POUs are continuing to fund testing to establish the energy savings from more efficient laboratory fume hood retrofits in multiple climate zones, expanding on an initial PWP project at the Caltech campus in 2012. This work will be submitted for the CEC's consideration and review as part of the next Title 24 Building Code update.

- Electric Vehicles: PWP provided incentives for individuals who purchase an EV and/or install a Level 2 EV Charger at their Pasadena address. PWP provides up to $200 worth of LED light bulbs to residential customers for notifying PWP about their new electric vehicle. In addition, PWP offers a bill credit of up to $400 to customers who install a Level 2 (240V) “wall mounted” or “hard-wired” charging station at their home, multi-unit complex, or business. The EV Charger incentive is also available to commercial customers and institutions for employees’ vehicle charging.
  PWP will continue to support the development of EV infrastructure in Pasadena and is installing a Direct Current Fast Charger in the City of Pasadena through grant funding that was received from the CEC.

PASADENA WATER & POWER – FY 2014/2015 ENERGY EFFICIENCY RESULTS

Pasadena		Resource Savings Summary									Cost Summary			
Program Sector (Used in CEC Report)	Category	Units Installed	Gross Coincident Peak Savings (kW)	Gross Annual Energy Savings (kWh)	Gross Lifecycle Energy Savings (kWh)	Net Coincident Peak Savings (kW)	Net Annual Energy Savings (kWh)	Net Lifecycle Energy Savings (kWh)	Net Lifecycle Gas Savings (MMBtu)	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)	Utility ($/kWh)
Appliances	Res Clothes Washers	1		284	3,124		88	968		1	$100	$14	$114	$0.15
HVAC	Res Cooling	1,081	8	48,914	372,535	7	46,229	333,518		215	$50,509	$8,026	$58,535	$0.22
Appliances	Res Dishwashers	1		58	580		35	348			$75	$5	$80	$0.29
Consumer Electronics	Res Electronics													
HVAC	Res Heating													
Lighting	Res Lighting	36,835	77	709,317	11,369,188	77	709,317	11,369,188		6,449	$568,289	$98,209	$666,498	$0.08
Pool Pump	Res Pool Pump	61	2	41,114	411,140	1	24,668	246,684		147	$18,575	$3,788	$22,363	$0.11
Refrigeration	Res Refrigeration	764	39	256,694	1,855,128	33	211,287	1,456,594		822	$176,058	$31,617	$207,675	$0.18
HVAC	Res Shell	14,524	63	63,770	698,557	50	49,589	453,678		270	$22,990	$6,156	$29,146	$0.09
Water Heating	Res Water Heating													
Comprehensive	Res Comprehensive	244	13	5,728,571	5,728,571	13	5,728,571	5,728,571		3,410	$395,245	$68,857	$464,102	$0.08
Process	Non-Res Cooking													
HVAC	Non-Res Cooling	10	294	1,720,741	34,394,820	294	1,720,741	34,394,820		22,001	$284,581	$44,123	$328,704	$0.01
HVAC	Non-Res Heating													
Lighting	Non-Res Lighting	157	499	2,925,015	42,143,066	499	2,925,015	42,143,066		24,960	$598,485	$88,546	$687,031	$0.02
Process	Non-Res Motors	6	97	613,502	9,816,032	97	613,502	9,816,032		5,471	$54,221	$8,510	$62,731	$0.01
Process	Non-Res Pumps	1		971,562	15,544,992		971,562	15,544,992		8,664	$174,881	$13,477	$188,358	$0.02
Refrigeration	Non-Res Refrigeration	15	14	100,657	756,053	14	100,657	756,053		421	$21,773	$3,193	$24,966	$0.04
HVAC	Non-Res Shell	3	54	189,412	2,267,880	54	189,412	2,267,880		1,377	$30,620	$2,684	$33,304	$0.02
Process	Non-Res Process													
Comprehensive	Non-Res Comprehensive	3	47	65,949	527,592	47	65,949	527,592		320	$10,850	$646	$11,496	$0.03
Other	Other	1	650	4,085,060	4,085,060	650	4,085,060	4,085,060		2,481	$0		$0	
SubTotal		53,707	1,857	17,520,619	129,974,319	1,836	17,441,681	129,125,045		77,010	$2,407,251	$377,851	$2,785,102	$0.03
T&D	T&D	1	39	345,144	10,354,320	39	345,144	10,354,320		6,289	$0		$0	
Total		53,708	1,896	17,865,763	140,328,639	1,875	17,786,825	139,479,365		83,299	$2,407,251	$377,851	$2,785,102	

EE Program Portfolio	TRC Test	**1.57**
	PAC Test	**5.86**

Excluding T&D

PITTSBURG POWER DBA ISLAND ENERGY

Island Energy At a Glance

- Year established: 1996
- Climate Zone(s): 3
- Number of retail customer connections: 538
- Percent of retail sales by customer class: 9% residential, 91% commercial
- All Energy Efficiency Programs are funded by Island Energy's Public Benefits Fund (PBF). During Fiscal Year 2014-2015, the annual PBF collection is $129,557 from electricity sales and $ 4,328 from natural gas sales. During Fiscal Year 2014-2015, $12,160 is expended on Commercial Lighting Retrofit Program, $34,765 expended on Commercial Motors Improvement and $ 69,890 is spent on Solar Incentive Program in the form of utility rebates. Unused fund in each program is carried forward to next year's respective program.

Utility Overview

Island Energy is a very small publically owned utility provides electric and natural gas distribution services to a decommissioned Navy base named Mare Island, which now hosts many different kinds of businesses and 287 residential homes. Most of the residential units were built in 2007 and 2008 with good insulation and high energy efficient appliances. Residential Energy Efficiency Programs include free onsite energy audits to make sure residents reach their energy efficiency goals.

Most commercial buildings were built over 60 years ago. Now many of them have been refurbished and re-purposed for different kinds of businesses. Island Energy tailored its Commercial Energy Efficiency Programs to meet the needs of business owners on Mare Island. Island Energy provides rebates to these improvements to help lower business owners' initial investments and shorten their payback period.

Major Program Changes

To encourage uses of electric vehicles on Mare Island, Island Energy has implemented rebate program for EV charging stations. Island Energy not only provides rebates for electric vehicle charger installations at residential/commercial premises, but also provides a block of energy at the lowest rate to electric vehicle customers.

Program Highlight

The Commercial Lighting program has the greatest impact among all Energy Efficiency Programs and contributes over 85% of energy savings to Island Energy's Annual Energy Reduction Goal. Most commercial buildings on Mare Island have outdated lighting layouts and fixtures. Island Energy provides rebates for one-for-one lighting fixture replacement, as well as customized lighting retrofit projects. Most commercial lighting projects update the whole lighting layout with fewer and much more efficient lights or LEDs, resulted in 65% -80% wattage reductions and energy savings. With the rebates that Island Energy

offers, the payback period for such lighting project is usually 1-2 years. The Commercial Lighting Program is definitely the most cost-effective energy saving measure on Mare Island.

Program Descriptions

- Commercial Lighting Program: Lighting Redesign, Overhaul or Retrofit Projects for Commercial Buildings. Incentive is based on one-for-one replacement or calculated based on expected annual energy Savings.
- Commercial Motors & Process Improvement: Replacement of Old Motors with NEMA Premium Efficiency Motors
- Compressed Air System: Installation of New Compress Air System or Redesign/Retrofit of Old Compress Air System
- Commercial Solar Incentive Program: Rebate for photovoltaic solar systems for commercial buildings and parking structures
- Residential Home Energy Audit: Free On-Site Energy Advisory Service to Residential Customers
- Residential Retail Lighting: Free CFL Light Bulbs & LED Lights to Residential Customers
- Residential Appliance Efficiency: Rebates for Energy Star Qualified Clothes Washers, Dishwashers, Air Conditioners and Refrigerators.
- Residential Solar Incentive Program: Rebate for photovoltaic solar systems for residential properties.
- Residential Net Energy Metering Program: Allow solar customers to bank their energy generation credits and to choose to be compensated at a rate equal to the Utility's avoided energy cost
- LED Lighting: Rebates for LED Street Lights
- EV Charging Station: Rebate for electric vehicle charger installations

EM&V

The utility files EM&V reports as part of public utilities reporting compliance. Coming into year 2015, staff will focus more resources on R&D demonstration and educational programs on renewable energy resources and technologies for the public interests, such as community solar and green-energy programs.

Sources of Energy Savings

Energy Efficiency Programs are administered and monitored in the same way that they have been in the past. Staff review Energy efficiency applications and monitor closely on energy consumption changes after EE measures are installed. Utility has dedicated staff time to monitor and maintain spreadsheets and data for energy savings from energy efficiency and solar incentive programs.

Complimentary Programs

- Low-Income Programs: Island Energy offers 20% discount on electric and natural gas charges to qualified low-income customers.

PITTSBURG POWER DBA ISLAND ENERGY – FY 2014/2015 ENERGY EFFICIENCY RESULTS

Pittsburg		Resource Savings Summary									Cost Summary			
Program Sector (Used in CEC Report)	Category	Units Installed	Gross Coincident Peak Savings (kW)	Gross Annual Energy Savings (kWh)	Gross Lifecycle Energy Savings (kWh)	Net Coincident Peak Savings (kW)	Net Annual Energy Savings (kWh)	Net Lifecycle Energy Savings (kWh)	Net Lifecycle Gas Savings (MMBtu)	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)	Utility ($/kWh)
Appliances	Res Clothes Washers	1		284	1,988		227	1,590		1	$75	$330	$405	$0.30
HVAC	Res Cooling													
Appliances	Res Dishwashers													
Consumer Electronics	Res Electronics													
HVAC	Res Heating													
Lighting	Res Lighting													
Pool Pump	Res Pool Pump													
Refrigeration	Res Refrigeration	1		171	1,197		137	958		1	$50	$276	$326	$0.40
HVAC	Res Shell													
Water Heating	Res Water Heating													
Comprehensive	Res Comprehensive													
Process	Non-Res Cooking													
HVAC	Non-Res Cooling													
HVAC	Non-Res Heating													
Lighting	Non-Res Lighting	160	249	157,071	1,884,852	199	125,657	1,507,882		836	$12,160	$5,032	$17,192	$0.02
Process	Non-Res Motors													
Process	Non-Res Pumps													
Refrigeration	Non-Res Refrigeration													
HVAC	Non-Res Shell													
Process	Non-Res Process													
Comprehensive	Non-Res Comprehensive													
Other	Other													
SubTotal		162	249	157,526	1,888,037	199	126,021	1,510,430		837	$12,285	$5,638	$17,923	$0.02
T&D	T&D													
Total		162	249	157,526	1,888,037	199	126,021	1,510,430		837	$12,285	$5,638	$17,923	

EE Program Portfolio	TRC Test	**1.92**
	PAC Test	**9.88**

Excluding T&D

PLUMAS-SIERRA RURAL ELECTRIC COOPERATIVE

Plumas-Sierra Rural Electric Cooperative (PSREC) At a Glance

- Established 1937
- PSREC serves climate zone 16 in Northern California
- PSREC serves approximately 7,807 retail customers through approximately 8,477 meters
- Percent of retail sales by customer class – residential = 43.7%, commercial = 7.5%, industrial =41.5%, agriculture =7.3%
- Budgeted amount for energy efficiency programs in 2015 was $105,661. The amount actually expended was $72,300. Funding for energy efficiency programs is collected on member bills through the Public Benefits Charge.
- PSREC had load reduction of 1.2% in 2015

Utility Overview

Founded in 1937, Plumas-Sierra Rural Electric Cooperative (PSREC) is a member-owned electric distribution utility providing electrical power and related services to more than 7,800 member/owners in Plumas, Lassen, and Sierra counties in California and portions of Washoe County in Nevada. We are a true cooperative, controlled by the membership through an elected seven-person board of directors.

Our goal is to provide utility services with a high level of reliability for fair and reasonable costs. We are also dedicated to improving the quality of life of our member-owners and our local communities.

Major Program Changes

PSREC continues to introduce contractors to new technologies for building more energy efficient homes.

Attempts to diversify programs to include small commercial and irrigation members have realized less than optimal results and participation.

The E3 model has limitations in how coincident peak demand savings are reported since PG&E's load profile is applied as the default. An important aspect to note is PSREC's unique peak demand occurs during winter hours of 5 a.m. to 10 a.m. Therefore, the most cost-effective program concentration is to reduce demand in the winter.

As a heating utility, very little savings are achieved for cooling. Members realize more benefit from retrofitting outdated and oversized baseboard heaters to more efficient ductless mini-split systems, ground-source heat pumps and sealing their homes with weatherization and insulation measures. Building envelope upgrades and heating system retrofits proved to have more value to our members who needed it most, typically those with low or middle class income.

Program Highlight

We again experienced the greatest impact in our Weatherization Program. PSREC's diverse territory of essentially older, rural mobile and single family homes, many of which have single pane windows or are extremely below code, have recently seen many foreclosures and changes in ownership contributing to renovating and upgrading drafty windows and sealing air leaks.

Program Descriptions

- Geothermal Heating/Cooling Loans - 0% interest ground source heat pump loop loans available for installation of ground-source heat pumps. This program has suffered due to the near halt of construction in our area.
- ENERGY STAR® Appliance - ENERGY STAR® Appliance Rebates: Rebates available for the purchase of an ENERGY STAR® refrigerator, dishwasher, clothes washer or other small electronics.
- ENERGY STAR® Lighting - ENERGY STAR® LED Lamp Program: Offered rebates for the purchase and installation of LED lamps.
- ENERGY STAR® Lighting - LED Holiday Light Rebate: Rebates provide an incentive to replace incandescent holiday light strands with qualified new ENERGY STAR LED holiday light strands.
- Appliance Recycling - Non-essential Freezer/Fridge Retirement: Rebates offered for recycling a non-essential freezer or refrigerator.
- Efficiency/Green Building Education - Education/Outreach: Provide energy efficiency and conservation information to interested members to help them reduce their bill, understand their energy consumption and make their home more efficient. This program has successfully addressed high bill concerns by empowering members to use information such as our 'Do-It-Yourself Energy Audit' to learn more about their home and how they use energy.
- Efficiency/Green Building Education - Energy Audits: PSREC provides free comprehensive energy audits to assist members with energy conservation and troubleshooting high energy consumption in their home. This program has been successful in educating members about efficiency and conservation and assisting in reduction of energy use, especially in low-income homes. Commercial Energy Audits: Provide free energy audits to businesses to assist members with energy conservation and troubleshooting high energy consumption in their business. With the suffering economy, our local businesses are also suffering. This program has been successful in assisting business owners in making decisions in efficiency upgrades and conservation.
- Water Heaters - Marathon Water Heater Program: Discounted sales of high-efficiency electric water heaters. This program remains steady, yet has been impacted with the halt of new construction.
- Ag Irrigation - Irrigation Efficiency Program: To encourage the installation of energy efficient equipment in agricultural irrigation systems PSREC offers rebates for pump tests and efficiency improvements.
- Weatherization - Weatherization Program: By retrofitting a home to above-code R-Values, and upgrading windows to double-pane high-performance windows, members will not only realize the

added comfort, but also gain increased home values and curb-side appeal. PSREC encourages members to invest in weatherization measures prior to, or in addition to, investing in a new heating source for energy conservation.

- HVAC – HVAC Rebates: PSREC provides members with rebate options to encourage installation of energy-efficient electric heat pumps and ground-source heat pumps in new construction and existing homes and small businesses. Upgrading to an energy-efficient heating and cooling system will contribute to increased comfort in homes or businesses while helping to reduce overall energy use.

EM&V

PSREC EM&V reports can be found online at: http://www.ncpa.com/current-issues/energy-efficiency-reports.html.

PSREC developed its five year EM&V plan in 2011 to focus on improving existing energy efficiency programs with a yearly internal review to evaluate effectiveness and improvement areas. PSREC has committed to seek third party evaluation of its programs every five years, dependent upon budget.

Plumas-Sierra's Five Year Evaluation, Measurement and Verification Plan has initiated a focus on the following items:

- Update the GeoExchange program to better represent the outcome of the engineering evaluation performed by Efficiency Services Group, LLC.
- Review the process evaluation of all residential energy efficiency programs and streamlining the method of rebate tracking.
- Participation in NCPA's Demand-side Management Database through Energy Orbit allows for the ability to comprehensively measure and quantify program goals.
- Conduct a study to verify the reported energy efficiency program savings and reductions in demand.
- Verify a sample of installations through a review of the application and receipt documentation.

Complimentary Public Benefits Programs

- Plumas-Sierra Solar Program: The Plumas-Sierra Solar Program (PSSP) is a program designed to encourage PSREC members to install high-quality solar PV systems on their homes and businesses and start producing clean, renewable energy.
- Net Metering Program: PSREC is also pleased to offer net-metering for members that install solar PV systems. In accordance with State Assembly Bill 920, all of PSREC's solar members are eligible to receive compensation for generating net surplus electricity.
- Meter Lending Program: Members can borrow our WattsUp® meter to plug in 120-volt appliances, helping them identify energy use of specific appliances. This program has helped several members understand just how much an appliance or space heater really uses and helps them make the choice of unplugging or reducing energy use.
- Lending Library and Resource Center: Provides energy efficiency and renewable energy resources to members through a book lending library and resource center in our office lobby.

- Low Income Winter Rate Assistance Program: Income-qualified members can apply for a discounted rate during the heating season. In conjunction, a home energy audit is offered to assist members with energy conservation. This program is steadily growing as members who are struggling in the weak economy are extremely appreciative of the assistance.
- Research, Development, and Demonstration: PSREC is researching the feasibility of installing a 250KW community solar project to offer solar energy to our members who currently cannot install solar on their homes or businesses due to cost, location or ownership status.

PLUMAS-SIERRA RURAL ELECTRIC COOPERATIVE – FY 2014/2015 ENERGY EFFICIENCY RESULTS

Plumas-Sierra		Resource Savings Summary									Cost Summary			
Program Sector (Used in CEC Report)	Category	Units Installed	Gross Coincident Peak Savings (kW)	Gross Annual Energy Savings (kWh)	Gross Lifecycle Energy Savings (kWh)	Net Coincident Peak Savings (kW)	Net Annual Energy Savings (kWh)	Net Lifecycle Energy Savings (kWh)	Net Lifecycle Gas Savings (MMBtu)	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)	Utility ($/kWh)
Appliances	Res Clothes Washers	5		305	3,355		95	1,040		1	$175	$48	$223	$0.28
HVAC	Res Cooling	13		2,388	35,820		1,910	28,656		17	$2,550	$1,423	$3,973	$0.19
Appliances	Res Dishwashers	6		240	3,600		144	2,160		1	$210	$100	$310	$0.20
Consumer Electronics	Res Electronics													
HVAC	Res Heating													
Lighting	Res Lighting	271		6,792	102,350		3,668	55,269		28	$1,355	$7,721	$9,076	$0.23
Pool Pump	Res Pool Pump													
Refrigeration	Res Refrigeration	27		17,353	175,155		12,147	122,609		67	$1,700	$9,466	$11,166	$0.12
HVAC	Res Shell	1,244	14	277,621	4,733,115		61,807	927,112		523	$14,631	$9,652	$24,283	$0.04
Water Heating	Res Water Heating	504		72	472,580		43	283,548		152	$3,870	$8,265	$12,135	$0.05
Comprehensive	Res Comprehensive													
Process	Non-Res Cooking													
HVAC	Non-Res Cooling													
HVAC	Non-Res Heating													
Lighting	Non-Res Lighting													
Process	Non-Res Motors													
Process	Non-Res Pumps	1			10,410						$1,041		$1,041	
Refrigeration	Non-Res Refrigeration													
HVAC	Non-Res Shell													
Process	Non-Res Process													
Comprehensive	Non-Res Comprehensive													
Other	Other													
SubTotal		2,071	14	304,771	5,536,385		79,814	1,420,394		788	$25,532	$36,676	$62,208	$0.06
T&D	T&D													
Total		2,071	14	304,771	5,536,385		79,814	1,420,394		788	$25,532	$36,676	$62,208	

EE Program Portfolio	TRC Test	**1.14**
	PAC Test	**2.52**

Excluding T&D

PORT OF OAKLAND

Port of Oakland At a Glance

- Year established: Prior to 1990
- Climate Zone(s): 3
- Number of retail customer connections and approximate number of retail customers served: 130-150
- Percent of retail sales by customer class – residential, commercial, industrial, agriculture: 100% Commercial
- Budgeted amount for energy efficiency programs, amount actually expended and funding sources; specify if unused EE dollars are reallocated to other Public Benefits program: All Energy Efficiency Programs are funded by AB 1890 funds. Beginning Balance of AB 1890 funds for this year (FY15) is $890,154 AB 1890 revenue for this year (FY15) is $263,962.

Port of Oakland Overview

The Port of Oakland exemplifies a unique combination of public/private endeavors. It encompasses a world-class container port, a thriving airport, an array of retail and commercial buildings and acres of recreational and open space. The Port of Oakland, through its policies and its tenants' activities, supports approximately 50,000 jobs in the Northern California mega region and impacts about 827,000 jobs nationwide. The Port has approximately 130-150 commercial electric customers.

Major Program Changes

There were no major changes to the program offerings in FY15. We anticipate doing a review of all of our programs in FY16 and making strategic changes to encourage customer participation.

Commercial Program Descriptions

- Energy Audits: The Port provides Energy Audits that focus on five major energy saving retrofit/improvement projects that will result in load reduction and more efficient use of energy. The proposed energy efficiency projects are prioritized by highest to lowest energy savings. Rebates are provided upon project completion, up to 100 percent of the total energy audit cost.
- Energy Saving Measures Exceeding Title 24 Standards: Port will provide a rebate for any new facility constructed within the Port by its electricity customers that exceed the title 24 standards in energy saving measures. Eligible facility must reduce energy usage by a minimum of 10% compared to the standard title 24 facility. This rebate will pay for a % of the cost difference between a standard and an upgraded title 24 equipment (such as HVAC units) and material.
- Energy Saving Equipment Retrofits/Improvements Rebates: The Port has implemented a program that provides generous rebates and solid technical support for the installation of new energy efficiency equipment/improvements by our commercial customers. Under our program, the eligible projects must reduce energy usage by a minimum of 20% to be eligible for a rebate of the equipment cost differential (up to a 90% rebate for energy saving of 90% or more).

- Lighting Retrofit: A program providing rebates for the installation of energy efficiency lighting that reduces annual energy usage by at least 35% in commercial facilities. This rebate is based on a single flat incentive rate of $.05 per first year annual kWh saved.

Complimentary Programs

- Energy Saving/Efficiency Research, Development, and Demonstration Programs: Port electricity customers that do research, development and demonstrate new energy saving/efficiency programs are entitled to a rebate up to 20% of the cost of a project based on availability of funds.
- Photovoltaic (PV) Power Generating Systems In Accordance with Senate Bill 1 (SB1): Beginning January 1, 2008, the Port will reimburse new solar energy generating facilities a one-time flat rate of $3.50 per watt (AC) of installed capacity. The new solar energy generating facilities must obtain Port approval and must comply with all regulatory requirement prior to the construction of the facility. This rebate is subjected to a 7% reduction per year per SB1.
- Other Renewable (or Green) Energy Programs: Beginning January 1, 2008, this rebate will reimburse new clean wind energy generating facilities that generates over 7.5 kilowatts a onetime flat rate of $1.50 per watt (AC) of installed capacity, and if the facility generates less than 7.5 kilowatts, then the rebate will be a onetime flat rate of $2.50 per watt (AC) of installed capacity. In addition, the new wind power energy generating facilities must obtain Port approval and must comply with all regulatory requirements prior to the construction of the facility. All other renewable generation that qualifies under this program are given a maximum rebate of 20% of the construction cost of the generating facility, based on the availability of funds.

PORT OF OAKLAND – FY 2014/2015 ENERGY EFFICIENCY RESULTS

Oakland		Resource Savings Summary									Cost Summary			
Program Sector (Used in CEC Report)	Category	Units Installed	Gross Coincident Peak Savings (kW)	Gross Annual Energy Savings (kWh)	Gross Lifecycle Energy Savings (kWh)	Net Coincident Peak Savings (kW)	Net Annual Energy Savings (kWh)	Net Lifecycle Energy Savings (kWh)	Net Lifecycle Gas Savings (MMBtu)	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)	Utility ($/kWh)
Appliances	Res Clothes Washers													
HVAC	Res Cooling													
Appliances	Res Dishwashers													
Consumer Electronics	Res Electronics													
HVAC	Res Heating													
Lighting	Res Lighting													
Pool Pump	Res Pool Pump													
Refrigeration	Res Refrigeration													
HVAC	Res Shell													
Water Heating	Res Water Heating													
Comprehensive	Res Comprehensive													
Process	Non-Res Cooking													
HVAC	Non-Res Cooling													
HVAC	Non-Res Heating													
Lighting	Non-Res Lighting													
Process	Non-Res Motors													
Process	Non-Res Pumps													
Refrigeration	Non-Res Refrigeration													
HVAC	Non-Res Shell													
Process	Non-Res Process													
Comprehensive	Non-Res Comprehensive													
Other	Other													
SubTotal														
T&D	T&D													
Total														

EE Program Portfolio	TRC Test	
	PAC Test	

Excluding T&D

RANCHO CUCAMONGA MUNICIPAL UTILITY

Rancho Cucamonga Municipal Utility (RCMU) At a Glance

- Year established: 2001
- Climate Zone(s): 10
- Number of retail customer connections: 896
- Percent of retail sales by customer class: 60% Commercial and Industrial, 40% Residential
- Budgeted amount for energy efficiency programs, amount actually expended and funding sources; specify if unused EE dollars are reallocated to other Public Benefits program: $140,000

Utility Overview

The amount of rebates in fiscal year 2015 has remained steady and comparable to the previous years with an increase to the quantity of equipment being replaced at one time per rebate. RCMU promotes the rebate programs and provide information to educate customers on energy efficiency practices in the customer newsletter, bill inserts and online. Free energy audits are currently utilized to educate customers on energy savings and potential upgrades on existing equipment. RCMU continues to expand the existing distribution lines for projected future growth.

Program Highlight

In 2015, RCMU processed 5 energy efficiency applications and issued $14,448 in rebates, which will save an estimated 189,021 kWh per year. Most of the rebates included some type of LED lighting upgrade to existing equipment and one upgrade to refrigeration. After receiving a large response to the direct installation program during the program's commencement in 2014, there was a decline in participation in 2015. Interest did begin to increase late in the fiscal year as the summer months and high temperatures progressed.

Program Descriptions

- Energy Audits: RCMU offers free, customized energy audits including lighting assessment, HVAC assessment, equipment assessment and a review of energy usage. Specific cost-effective recommendations to improve energy efficiency and reduce energy use are provided.
- Direct Savings Program: To encourage and assist businesses to reduce their energy usage, RCMU will pay and install up to $1,500 of recommended retrofit items that are determined from the energy audit. Any cost above the $1,500 limit is paid by the business.
- Energy Efficiency Rebate Program: RCMU has adopted an "Express Solution" model for energy efficiency rebates. RCMU does not restrict customers to specific technologies or approved models of equipment; customers can install an energy efficient improvement within the approved categories with little restrictions. Customers receive a rebate for estimated kilowatt hour savings for the first year. RCMU uses the following categories and incentive rates:

Category	Annual kWh Savings Rebate	Annual kW Savings Rebate*
Lighting	$0.05/kWh	$100.00/kW
Interior LED	$0.08/kWh	$100.00/kW
Exterior LED	$0.09/kWh	N/A
Delamping	$0.05/kWh	$100.00/kW
HVAC	$0.09/kWh	N/A
Motors	$0.09/kWh	N/A
Refrigeration	$0.09/kWh	N/A

Complimentary Programs

- Renewable Energy Programs: In FY 2015, RCMU added two new solar customers into the service area that are estimated to save a total of 98,234 kWh per year. Due to an increase in customer interest to install solar and several applications being submitted, RCMU had to close the program early when all funds were expended for the fiscal year and open a wait list for the next fiscal year's funding. Staff modified the rebate program to allow for multiple solar projects to take advantage of the program.
- Low Income Program: The program is intended to assist customers with their bill and will be funded by the RCMU Public Benefit Fund. The household size and gross income requirements will be based off of the San Bernardino County Income Limits and Documentation system. Qualified residents will need to provide an application with supporting documentation annually to receive a credit on their bill each month.
- Medical Support Assistance Program: The program will assist eligible residential customers where a full time resident of the household regularly requires the use of essential medical support equipment. An application with supporting documentation from the patient's doctor is required to receive the credit each month.
- New Development Incentive: This incentive is for new development that is built to exceed a minimum of 15% above Title 24 Code. The incentive payment is based off of the final Title 24 report created by a Certified Energy Plans Examiner (CEPE) and verified by a third party certified Home Energy Rating System (HERS) Rater.

RANCHO CUCAMONGA MUNICIPAL UTILITY – FY 2014/2015 ENERGY EFFICIENCY RESULTS

Rancho Cucamonga		Resource Savings Summary									Cost Summary			
Program Sector (Used in CEC Report)	Category	Units Installed	Gross Coincident Peak Savings (kW)	Gross Annual Energy Savings (kWh)	Gross Lifecycle Energy Savings (kWh)	Net Coincident Peak Savings (kW)	Net Annual Energy Savings (kWh)	Net Lifecycle Energy Savings (kWh)	Net Lifecycle Gas Savings (MMBtu)	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)	Utility ($/kWh)
Appliances	Res Clothes Washers													
HVAC	Res Cooling													
Appliances	Res Dishwashers													
Consumer Electronics	Res Electronics													
HVAC	Res Heating													
Lighting	Res Lighting													
Pool Pump	Res Pool Pump													
Refrigeration	Res Refrigeration													
HVAC	Res Shell													
Water Heating	Res Water Heating													
Comprehensive	Res Comprehensive													
Process	Non-Res Cooking													
HVAC	Non-Res Cooling													
HVAC	Non-Res Heating													
Lighting	Non-Res Lighting	448	43	151,264	2,419,180	43	151,264	2,419,180		1,433	$10,382	$26,924	$37,305	$0.02
Process	Non-Res Motors													
Process	Non-Res Pumps													
Refrigeration	Non-Res Refrigeration	115	6	52,325	523,250	6	52,325	523,250		292	$4,721	$5,076	$9,797	$0.02
HVAC	Non-Res Shell													
Process	Non-Res Process													
Comprehensive	Non-Res Comprehensive													
Other	Other													
SubTotal		563	49	203,589	2,942,430	49	203,589	2,942,430		1,724	$15,102	$32,000	$47,102	$0.02
T&D	T&D													
Total		563	49	203,589	2,942,430	49	203,589	2,942,430		1,724	$15,102	$32,000	$47,102	

EE Program Portfolio	TRC Test	**11.00**
	PAC Test	***7.47***

Excluding T&D

Redding At a Glance

- Year established -1921
- Climate Zone -11
- Number of retail customer connections – 43,832
- Percent of retail sales by customer class – Residential 47%, Commercial 51%, Industrial 2%
- Energy Efficiency (EE) Budget - $3.7 million. The EE programs are funded from REU revenues as follows: $3.3 million Public Benefits charges, $ 0.4 million from general revenues. Expended $2.7 million, with remaining unspent funds carried over to the next budget year.
- Load Growth – Total sales for FY 2015 were 750 million kWhs, a 0.8 percent decrease compared to FY 2014. Forecasted average annual increase for the next five years is 0.002 percent.

Utility Overview

For the last few years, the Redding service area has experienced, as many other electric utilities have, a reduction in kWh sales compared to the level of electricity sales before the recent multi-year recession. Total sales for FY 2015 were 750 million kWhs, a .8 percent decrease compared to FY 2014. Lower year-over-year sales figures for 2015 is due to mild weather, low economic activity and impacts of EE programs. Forecasted average annual increase for the next five years is 0.002 percent. This is mainly a result of a near no growth outlook based on population expectations, effective EE programs and local economic conditions.

Since the inception of REU's Public Benefits Program and throughout the recent and continuing difficult economic times, its Public Benefits Program has been successful and well received in the Redding community. To date, around 70 percent (or more than two-thirds) of REU's Public Benefits Program expenditures have been directed towards energy efficiency improvements. Because Redding is a relatively small and somewhat isolated service territory, REU has been able to build strong relationships with local businesses, including trade allies and the development community, to increase the awareness of cost-effective energy efficiency opportunities in new construction and remodeling projects throughout the community. These ties have proven to be most valuable when there is a viable need to increase or decrease a certain program and also in evaluating the addition of new programs. All EE programs need adjusting from time to time as building standards and technologies change. REU has an effective community outreach effort through the Energy Services Division's (ESD) direct engagement with local energy product vendors which makes it possible to have a continuously evolving and adaptable EE program.

Major Program Changes

To continue working toward improving REU's operating efficiency and to further provide cost-effective efficiency improvements in our system, the Utility's Thermal Energy Storage (TES) program was expanded in FY 2014 to include new construction in addition to existing buildings within REU's service territory. For

FY2015 the amount of projects has increased further. This effort provides for better integration of TES into commercial building designs and therefore lowers the installation cost which, in turn adds enhanced value to those TES installations. REU's TES program focuses on the 5 ton, direct expansion air-conditioning (DX-AC) market. This application of TES technology is provided with the addition of the Ice Bear® TES unit to qualified AC units. In June of 2012, Redding entered into a multi-year, multi-million dollar contract to provide several megawatts of peak load shifting capability by 2017. Prior to 2012, Redding had been installing the Ice Bear® technology for several years to validate the application of this technology to REU's customer base and unique (high peak demand, very low load factor) service territory requirements. With that considerable, in depth TES experience it was apparent an expansion of the program was warranted.

Program Highlight

Thermal Energy Storage (TES) Background:

As mentioned above, REU's operating efficiency is directly impacted by our summer air-conditioning driven peak system demand. The Utility's Thermal Energy Storage (TES) program was significantly expanded in FY 2013. REU's TES program focuses on the 5 ton, direct expansion air-conditioning (DX-AC) market. Redding's commercial customer base has a significant amount of these types of units operating in a variety of businesses throughout the service territory.

How the Technology Works:

The Ice Bears® serve to reduce the applicable AC systems' peak demand on REU's electric system by diverting the vapor/gas refrigerant in the DX unit away from the compressor and into a coil that runs through the system's ice block during the peak period. By relying on the temperature differential in the ice to condense the refrigerant back to liquid state, rather than the mechanically-driven compressor, the compressor does not run during the peak period and the AC load is reduced by 95 percent for as much as six hours per day.

Further, because the TES compressor is used during off-peak hours to re-freeze the storage system's water and make the ice that will later be used to provide cooling, the Utility "shifts" the load from on-peak to off-peak hours, thereby allowing the Utility to generate electricity during the cooler nighttime hours when it is more economically and environmentally efficient to do so. Shifting load to the nighttime hours also allows the Utility to consider more wind power (RPS qualified), which is more plentiful at night.

With this nighttime operation, the compressor will typically run more efficiently than the same compressor running during the hottest hours of the day. Therefore, the customer will see a reduced amount of energy consumption (efficiency improvement) to provide a higher level of cooling comfort, and the Utility will see reduced operating costs as our load profile is flattened (operating efficiency/load factor improvement), a true win-win, cost-effective solution for all parties.

This continued focus on peak load reduction will be increasingly important for REU because more than half of our demand is driven by air-conditioner load. With the required use of the newer refrigerant R-410A in DX/AC units, the new AC units being installed in California will be at least 5 to10 percent less efficient than

older units that use R-22 when the temperatures exceed 105 to 115°F. Therefore, even though appliance standards require high SEER unit installation, these new units using R-410A will perform less efficiently at peak load times than older units with lower SEER ratings because the new refrigerant's performance degrades substantially when ambient temperatures reach 105°F or more – a regular summertime occurrence in Redding.

Results:

In FY 2015 REU installed 48Ice Bear® TES systems, an amount similar to the previous year FY 2014. This brings the total systems in service to 217, providing nearly two and a half megawatts of permanent load shift (PLS). These systems are dispatchable, low maintenance (energy storage material is water), and long-lived with at least a 20 year service life.

Program Descriptions

- Appliances: Rebates for Dishwashers. Only makes and models on the current ENERGY STAR eligibility list qualify for a rebate.
- HVAC: Rebates for Heating, Ventilation, Air Conditioning, Duct Repair, HVAC Cleaning, Swamp Coolers, and Whole House Fans.
- Ground Source Heat Pumps: Rebates offered for geothermal/ground source heat pumps
- Pool Pump: Pool Pump Program is only for programmable variable speed drive pumps installed on existing or new in-ground pools.
- Refrigeration: Rebates for Large and Small Refrigerators. Only makes and models on the current ENERGY STAR eligibility list qualify for a rebate.
- HVAC, Residential Shell: Weatherization Program – Consists of Insulation, Window Treatments, Water Heater Wraps, and Radiant & Thermal Barrier.
- HVAC, Non-Residential Cooling: Rebates for Heating, Ventilation, Air Conditioning, Duct Repair, HVAC Cleaning, and Swamp Coolers. Commercial projects rebate levels are evaluated on a case by case basis.
- Lighting, Non Residential: Lighting retrofit program has a pre-approval requirement that evaluates existing light vs. proposed new lighting to see if the project is eligible and is used as part of the process to determine the level of the rebate.

EM&V

During the reporting period REU reviewed its previous EM&V efforts and completed an EM&V report on the Utility's HVAC Rebate Program. During the first half of 2016 calendar year. REU is also planning another EM&V for our Lighting Program . Previous Redding EM&V reports are available on NCPA's Website: http://www.ncpa.com/current-issues/energy-efficiency-reports.html.

Sources of Energy Savings

REU, for the vast amount of its EE programs, uses the standard measures as constructed within the E3 reporting tool. For REU's two unique programs (TES and Home Performance) REU used the custom measure feature in E3 to model the energy and demand impacts of those programs.

Complimentary Public Benefits Programs

- Renewable Energy Programs: REU's Solar Program has been a great success. Funds collected from REU customers under SB 1 have been fully subscribed over the past year due to several large Performance Based Incentive (PBI) projects and the release of $750,000.00 rebate in 2014. REU received over 105 applications for rooftop solar rebates in less than two business days with this last round of rebates. REU continues to see significant interest and interconnection in solar PV activity despite the lack of available rebates from the Utility. Though REU is not providing solar rebates at this time, over this reporting period REU had 147 PV installations with an installed capacity of 1.3MW. Within the next 12 to 18 months several of our PBI solar rebate commitments will have been fulfilled freeing up additional solar rebate monies. REU is anticipating another round of rebates in 2016. REU suspended photovoltaic installations on some (3) circuits/feeders. Distributed generation penetrations (including solar PV) greater than 25% have the potential to have a significant impact REU's (and all utilities) ability to comply with Federal and State reliability requirements regarding both over voltage and under voltage issues as well as over frequency and under frequency cut out. Unfortunately there will still be limitation in certain areas. REU is working closely with local solar PV integrators/contractors on this issue as it continues to develop.

  ESD staff, on a monthly basis, monitors the amount of funds collected and how they are disbursed (since program inception). This process enables REU staff to ensure compliance with SB 1 requirements and to make plans for an optimal program completion in 2016-2017.
  Almost all of REU's renewable resource development efforts are in the solar photovoltaic (PV) development area. PV development is currently a separate program in and of itself, as mandated by State Senate Bill 1's passage and implementation. SB 1 funding has allowed REU to redirect dollars previously devoted to renewable development to low income assistance.

- Low-Income Programs:
  Low income assistance spending (through the CARES program and Lifeline Rate Discounts) continues to be the second largest area of our Public Benefits Program expenditures. During FY 2015, Lifeline support increased nearly $ 100,000to over $1,200,000. This has been a most beneficial program to a significant portion of our customer base that has limited situational and/or financial means to participate in direct EE programs.

- Electric Vehicle Charging Infrastructure:
  In 2015, to support electric vehicles in REU's service territory, REU has held both internal and external committee meetings to work on determining suitable charging locations and procuring infrastructure to support this new and growing electric service. The external committee, Upstate Plug-in Electric Vehicle Coordinating Council (Council) is charged with bringing vehicle charging stations infrastructure to the Siskiyou, Shasta and Tehama counties area. The Council's main near

term goal is to install some of the first charging stations near main roadways running through the tri-county region. REU has had an increasing interest in services from customers who are buying electric vehicles. This new utility load may have impacts in several areas related to energy efficiency, both at the customer and utility supply and distribution levels. For example, whether electric vehicles are charged during the day or night may impact the cost and benefits of EE programs already in place. Redding will continue to work on this and other areas as to how electric vehicles will impact various utility operations. During calendar year 2016 it is anticipated that at least one fast DC charger will be install in Redding as a result of te efforts mentioned above.

- Avtech Energy Efficiency Measures:
  Through the success of REU's Home Performance Program and what REU learned over the last six years by way of measured building performance as a test program, the Utility took action to ensure advanced energy efficiency design measures were implemented into its new headquarters at Avtech Parkway – measures that would significantly reduce REU headquarters' overall kW demand and energy (kWh) consumption.
  The following design and technology measures incorporated into REU's new headquarters resulted in a lower energy footprint than comparable, standard office buildings:
    - All interior lighting controlled, motion-sensored LED.
    - Installed HRV systems (heat recovery ventilators), reducing HVAC requirements and improving indoor air quality.
    - The HVAC system is an engineered system along with a well-planned duct design, which reduced the required heating and cooling tonnage requirement by nearly 50 percent!

  With these measures and technologies, REU's Avtech headquarters' total energy cost is currently tracking at $1.70 per square foot after 12 plus months of occupancy. This compared to our previous locations total energy cost of $2.97 per square foot. This equates to a 43 percent energy savings. That is a $35,560 per year savings. In addition to the energy savings the indoor air quality and comfort levels are significantly improved resulting in a stable relative humidity level with no more than a 2 to 3 degree temperature difference throughout the building.

REDDING ELECTRIC UTILITY – FY 2014/2015 ENERGY EFFICIENCY RESULTS

Redding		Resource Savings Summary									Cost Summary			
Program Sector (Used in CEC Report)	Category	Units Installed	Gross Coincident Peak Savings (kW)	Gross Annual Energy Savings (kWh)	Gross Lifecycle Energy Savings (kWh)	Net Coincident Peak Savings (kW)	Net Annual Energy Savings (kWh)	Net Lifecycle Energy Savings (kWh)	Net Lifecycle Gas Savings (MMBtu)	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)	Utility ($/kWh)
Appliances	Res Clothes Washers	253		34,661	381,271		10,745	118,194		59	$25,300	$1,479	$26,779	$0.29
HVAC	Res Cooling	52,850	229	382,001	3,082,674	196	316,243	2,593,044		1,585	$375,860	$85,673	$461,533	$0.25
Appliances	Res Dishwashers	490		28,420	284,200		17,052	170,520		86	$47,501	$2,137	$49,637	$0.37
Consumer Electronics	Res Electronics													
HVAC	Res Heating													
Lighting	Res Lighting													
Pool Pump	Res Pool Pump	233	90	398,663	2,910,934	54	239,198	1,746,560		879	$119,000	$21,887	$140,887	$0.10
Refrigeration	Res Refrigeration	588		83,385	1,167,390		58,370	817,173		443	$106,952	$13,836	$120,787	$0.20
HVAC	Res Shell	335,275	335	343,195	6,749,330	94	96,095	1,889,812		1,066	$177,145	$34,801	$211,946	$0.17
Water Heating	Res Water Heating	11		8,785	87,850		5,271	52,710		28	$6,410	$838	$7,248	$0.17
Comprehensive	Res Comprehensive													
Process	Non-Res Cooking													
HVAC	Non-Res Cooling	68	481	2,609	39,128	481	2,217	33,258		20	$1,457,916	$479	$1,458,395	$0.46
HVAC	Non-Res Heating													
Lighting	Non-Res Lighting	5,884	206	1,664,653	24,969,791	206	1,664,653	24,969,791		13,838	$59,173	$199,600	$258,773	$0.01
Process	Non-Res Motors													
Process	Non-Res Pumps													
Refrigeration	Non-Res Refrigeration													
HVAC	Non-Res Shell													
Process	Non-Res Process													
Comprehensive	Non-Res Comprehensive													
Other	Other													
SubTotal		395,652	1,341	2,946,371	39,672,566	1,031	2,409,842	32,391,063		18,005	$2,375,256	$360,730	$2,735,986	$0.10
T&D	T&D													
Total		395,652	1,341	2,946,371	39,672,566	1,031	2,409,842	32,391,063		18,005	$2,375,256	$360,730	$2,735,986	

EE Program Portfolio	TRC Test	**1.77**
	PAC Test	**1.37**

Excluding T&D

Riverside Public Utilities (RPU) At a Glance

- Riverside Public Utilities (RPU) was established in 1895
- Riverside is the 12th largest City in California
- RPU's service territory of approximately 82 square miles
- RPU's service territory is located entirely within Climate Zone 10
- Percent of retail sales by customer class is approximately 90% residential and 10% commercial, industrial and agricultural.
- Approximately 109,000 electric and 65,000 water retail customers serving a total population of approximately 317,000 residents
- Approximately $12,000,000 in total Public Benefit Funds in FY 14/15 was budgeted for all programs, administration and marketing. Approximately $4 million was expended on energy efficiency programs. In addition, approximately $3 million was expended in FY 14/15 on Low Income Assistance, Research Demonstration and Development, Renewable Energy, and other Public Benefits Activities (See below under Complimentary Public Benefits Activities)
- Load Growth for FY 14/15 was approximately 1%
- Annual Energy Use is approximately 2,200 gigawatt-hours
- Peak demand hit system high of 604 megawatts on September 15, 2014
- RPU employs approximately 500 full time employees

Riverside Public Utilities Overview

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RPU successfully exceeded the kWh savings goal of 1% of retail sales in FY 14/15 as adopted by the Board of Public Utilities. During FY 14/15, RPU assisted its customers in saving a total of over 20 million kWh. This is the fifth year in a row that RPU was able to exceed this aggressive goal. In order to achieve the 1% goal, the costs per kWh saved has increased over this five-year period by $.20 cents from a portfolio average of $.19 cents per kWh saved to $.39 cents per kWh saved in FY 14/15. Essentially, it is becoming more expensive to achieve the same level of kWh savings annually.

Riverside Public Utilities continues to play a key role in revitalizing the local economy. The Utility has bolstered Riverside's local economy by stabilizing utility rates through the City Council adopted rate freeze originally adopted in 2010. This rate freeze has provided customers with stable and predictable rates during this economic recovery period; however the rate freeze is beginning to erode utility revenue and Public Benefit Fund revenue. In FY 15/16 RPU has commenced a major study of all electric rate classifications to determine if future rate adjustments should be recommended to the Board and Council. RPU has experienced a modest expansion in the customer base and a 1% increase in load growth. Utility load growth has also lead to a 1% increase in retail sales. In addition,

RPU's injection of over $9 million of public benefit funds into the community annually has had a very positive impact on the local economy in terms of jobs and leveraging private investment.

Major Program Changes

RPU continues to enhance and expand its already extensive array of energy efficiency program offerings to its customers. The overall portfolio is examined quarterly for program requirements and incentive levels are adjusted up or down as necessary at the direction of the Utility General Manager. Although the local economy is much more stable and generally in a slow expansion mode, RPU is experiencing stagnant participation in energy efficiency rebate programs. Overall program participation has remained flat over recent program years at approximately 22,600 rebates per year. This flattening demand for energy efficiency programs is likely due to a combination of market saturation, customer perception that solar generation is of higher value than energy efficiency and overall cautious consumer confidence. Major changes or trends that impacted kWh savings in FY 14/15 include:

- The regional economy has generally improved with the unemployment rate within the City of Riverside falling to an annual average of 7% for FY 14/15. Although showing a positive trend, these unemployment figures still remain higher than both the statewide and the national averages.
- The County of Riverside successfully launched its Home Energy Renovation Opportunity (HERO) Program in 2012. This AB 811, Property Assessed Clean Energy (PACE) program continues to grow in popularity. HERO offers another important tool for RPU customers seeking an alternative to finance energy efficiency measures in their homes. This financing tool, however has not proven to be an attractive energy efficiency financing vehicle for commercial customers. Other financing tools may need to be explored to target commercial customers.
- Proposition 39 is resulting in some additional energy efficiency projects from local school districts and community colleges. Unfortunately these projects have been slow to complete and have resulted in more modest kWh savings than had originally been projected.
- There is a growing trend in the energy efficiency field toward the use of behavioral programs such as OPower in order to enhance customer engagement and drive energy efficiency through impacting customer behavior. RPU has completed its initial analysis of such program offerings and will be launching a pilot program with approximately 20,000 customers in late FY 15/16.
- RPU created several important new programs and modified some existing programs in FY 14/15. For example, RPU increased rebate amounts for the residential HVAC Replacement program for 16 SEER or higher rated units to incentivize customers to install more efficient HVAC equipment. As a utility located in Climate Zone 10, HVAC load is a major energy efficiency target. RPU also created a new Thermal Energy Storage Program with Ice Energy's Ice Bear product.

- The State of California is experiencing its fourth year of unprecedented drought. The drought is having a significant impact on utilities like RPU, that are both electric and water utility providers. Staff resources, by necessity, have been diverted away from energy efficiency programs in order to respond to the drought and the State's mandates for water conservation. The impact of this shift in resources will likely be realized in subsequent program year reporting. On a positive note, increased water savings has translated into some additional kWh savings as a result of the embedded energy in water production and delivery that has been avoided as a result of reduced customer consumption and conservation efforts.
- In order to capitalize on the growth of new LED lighting products in the marketplace, RPU created an LED retail buy-down program in partnership with GreenLite. Through local participating retailers, Public Benefit Funds are combined with GreenLite's distribution platform allowing RPU to offer several LED products at substantially discounted pricing for its customers. These attractive lighting incentives are designed to encourage customers to replace less efficient lighting products in their homes and businesses with state-of-the-art LED lighting products. The LED Buy-Down program was created in FY 14/15, but officially launched in FY 15/16.

Program Highlight

RPU's Small Business Direct Installation (SBDI) Program and Keep Your Cool (KYC) Direct Installation Programs continue to be a highlight of the overall program portfolio in terms of both customer acceptance and kWh savings. Although commercial customers only represent 10% of the total RPU customer base, the combined load of all commercial customers represents approximately 66% of the total utility consumption. With commercial customers representing the majority of utility load, RPU has dedicated more programs and resources to assist the commercial customer segment in achieving energy efficiency goals. RPU's small business customers have often been reluctant to participate in traditional rebate programs due to lack of upfront capital, lack of time or technical ability to implement energy efficiency projects. In addition, small businesses often do not own their buildings, introducing barriers and motivational factors into the decision making process on whether to implement energy efficiency projects. RPU's Small Business Direct Installation Program was designed to address these primary customer concerns. The SBDI program is a comprehensive direct installation program combining measures such as lighting retrofits and controls, HVAC tune-ups, LED exit and "open" signs, Tier 2 advanced power strips and various weatherization measures. The program is now available throughout the service territory and has been expanded to medium sized customers. SBDI offers businesses up to $2000 in free energy efficiency upgrades. Each project starts with an energy audit of the business' facility to prioritize recommended energy efficiency measures that customers can pay for through a co-payment to the utility's contractor for work above the incentive amount. RPU contractors have found that the market potential is substantial and that there is no shortage of businesses that can realize significant savings from energy efficiency upgrades provided through this program. Customer feedback regarding this program has been very positive with

over 1000 customers served in FY 14/15. The Keep Your Cool (KYC) Program is similar but more specifically focused on direct installation of cooling and refrigeration measures in mini-markets, delis, convenience stores and restaurants. Combined, the KYC and SBDI Direct Installation Programs have resulted in over 3 million kWh saved in this reporting year. Although on the higher end of measure costs within RPU's program portfolio, the direct installation programs are still relatively cost effective at an average of $.10-$.38 cents per kWh saved. In addition, RPU receives additional benefits from increased customer engagement and customer satisfaction through the direct installation programs.

Program Descriptions

Commercial Rebate Programs

- Air Conditioning Incentives – rebates for replacement of energy efficient AC units (Non-Res Cooling).
- Energy Star Appliances – rebates for purchase of Energy Star rated refrigerators, dishwashers, commercial clothes washers, solid door refrigerator/freezers, ceiling fans and televisions (Non Res-Lighting, Non Res-Cooling, and Non-Res Refrigeration).
- Lighting Incentive – rebates for kWh savings on installation of more energy efficient lighting and controls (Non-Res Lighting).
- Tree Power – rebates for purchase and planting of up to 5 qualifying shade trees per year (Non-Res Cooling).
- Weatherization – rebates for installation of insulation, window film and cool roofs (Non-Res Shell).
- Performance Based Incentive – rebates for customers who can demonstrate a kWh savings based on custom energy-efficiency measures (Non-Res Comprehensive).
- Commercial Food Service Program – This program is specifically targeted to commercial food service customers such as restaurants, hospitality providers, institutional, medical/hospital customers, schools and government customers. The program is offered in conjunction with Southern California Gas Company and provides customers with a comprehensive facility audit offering recommendations on specific energy efficiency measures, estimated return on investment and applicable utility incentives. In FY 14/15 over 30 businesses participated in the program and many were referred to the KYC Program.
- Key Account Energy Efficiency Program (KEEP) – This program is targeted to RPU's largest Time of Use Customers. This customer segment includes the top 300 RPU customers in terms of consumption. KEEP is intended to provide these Key Account customers with a comprehensive energy efficiency plan including a priority list of recommended energy efficiency measures along with an estimated return on investment and applicable utility incentives. RPU is also working with Southern California Gas Company on this program. Customers are also offered additional technical and contracting assistance to bring large energy efficiency projects from concept to completion. In FY 14/15 this program resulted in several large energy efficiency projects with local manufacturing companies (Non-Res Comprehensive).
- Custom Energy Technology Grants – Grants are awarded for research, development, and demonstration of energy efficiency and renewable energy projects that are unique to the business

or manufacturing process and can demonstrate energy savings, demand reduction or renewable power generation (RD&D Program)

- Energy Innovation Grants – Grants are available to public or private universities within RPU's service territory for the purpose of research, development and demonstration of energy efficiency, renewable energy, energy storage, strategic energy research and electric transportation (RD&D Program).
- Upstream HVAC Rebate Program – This program offers a rebate incentive for commercial high efficiency HVAC equipment purchases that exceed Title 24 requirements. The incentive is provided upstream at the wholesale distribution channel level, thereby encouraging distributors to stock and sell more efficient HVAC equipment (Non-Res Cooling).
- Energy Management Systems – rebates for the purchase and installation of energy management systems for monitoring and controlling facility energy load (None claimed this FY).
- New Construction and LEED construction Incentives – rebates for energy savings exceeding Title 24 standards for new construction projects pre-approved by Riverside Public Utilities (None claimed this FY).
- Pool and Spa Pumps Incentive – rebates for purchase of qualifying multi-flow or variable speed high-efficiency pumps and motors (None claimed this FY).
- Premium Motor Incentives – rebates for the purchase of premium high efficiency electric motors (None claimed this FY).
- Thermal Energy Storage Incentive – feasibility study and incentives available for use of thermal energy storage based on program guidelines (None claimed this FY).
- Ice Energy Thermal Energy Storage Pilot Program – This is a combined thermal energy storage program and energy efficiency program. The pilot program was created in FY 14/15 and implemented in FY 15/16. Public Benefit Funds will be used to replace old HVAC equipment with new energy efficient equipment installed concurrently with Ice Bear thermal energy storage equipment (None claimed this FY).

Residential Rebate Programs

- Energy Star Appliances – rebates for purchase of Energy Star rated refrigerators, dishwashers, clothes washers, room air conditioners, ceiling fans and televisions (Res Cooling, Res dishwashers, Res Clothes Washers, Res Electronics).
- Cool Cash – rebates for replacing Central Air Conditioners with a SEER rating of 15 above (Res Cooling)
- Tree Power – rebates for purchasing and planting of up to 5 qualifying shade trees per year and 1 free qualifying shade tree coupon printed on the March back of the bill (Res Cooling).
- Pool Saver – rebates for purchase and installation of high efficiency, variable speed or multi-flow pool pump motors (Res Pool Pump).
- Weatherization – rebates for installing attic insulation or wall insulation, standard rebates for duct replacement, duct testing/sealing, window film, solar and standard attic fans, whole house fans and cool roofs (Res Shell, Res Cooling).

- Appliance Recycling – free recycling service for old inefficient refrigerators and freezers (Res Refrigeration).
- Whole House Rebate Program – rebates for completing multiple energy efficiency measures as one project. Points are awarded for each type of measure and then multipliers are given at specific point intervals on a sliding scale to encourage implementation of multiple energy efficiency measures as one project under one application (Res Comprehensive).

Residential Direct Installation Programs

- Multi-Family and Mobile Home Direct Installation – This program offers multi-family and mobile home residents the direct installation of a specific list of measures including HVAC tune-ups, lighting efficiency upgrades, weatherization and Tier 2 advanced power strips. The program also addresses energy efficiency measures in multi-family and mobile home park common areas (Res Lighting).
- Energy Savings Assistance Program (ESAP) – This direct installation is targeted specifically to low income RPU customers. The program is offered in partnership and cooperation with The Southern California Gas Company. Measures include lighting efficiency upgrades, HVAC tune-ups, smart power strips and refrigerator recycling (low income assistance, Res Lighting, Res Cooling, Res Refrigeration).

Direct Installation Commercial Programs

- Small Business Direct Installation (SBDI) Program – This program provides small and medium sized businesses with energy audits and direct installation of energy efficiency measures such as lighting upgrades and controls, HVAC tune-ups, exit and open/closed signs and weatherization measures (Non-Res Comprehensive, Non-Res Lighting, Non-Res Cooling).
- Keep Your Cool (KYC) Program– This program is targeted to specific small businesses such as mini-marts, delis and convenience stores and restaurants that have a significant amount of refrigerated food and beverages storage. The program offers the direct installation of energy efficiency measures such as air curtains, cooler gaskets, automatic door closures, LED case lighting retrofits and high efficiency motor upgrades (Non-Res Cooling).

EM&V

Riverside Public Utilities is committed to providing cost effective, ongoing evaluation, measurement and verification efforts for its energy efficiency programs. EM&V costs are covered in the individual program budgets.

In addition to periodic program audits, RPU consistently performs the following in support of EM&V activities:

- An onsite inspection rate of no less than 10 percent for all residential program participants, performed by RPU staff and contractors.

- A pre- and post-inspection of 100% of commercial rebate participants, including a review of historical energy usage, energy-saving calculations and post measure bill analysis.
- All residential and commercial solar PV installations are field inspected and verified by city personnel for program compliance, system inter-connection standards and rated production output.
- Contracted with the engineering firm Partner Energy to verify claimed energy savings on large, complex or technical commercial projects prior to issuing a rebate incentive.
- Audits and installations performed by third-party contractors for RPU direct installation programs have high inspection rates that are performed by both the contractor and RPU staff.
- Refrigerator recycling program administered by Appliance Recycling Centers of America (ARCA) assures full inspection when the contractor picks up old appliances.

Sources of Energy Savings

RPU Generally relies on the TRM as the primary source for deemed energy savings used in the calculating and reporting annual program performance. If a specific measure cannot be found in the TRM, RPU will generally use a verified utility workpaper or appropriate engineering/manual calculation as back-up documentation to justify claimed kWh savings and the specific measure is entered into the E3 reporting tool as a custom measure.

Complimentary Programs

- Solar Rebate Program (SB 1) – RPU continues to promote residential and commercial participation in its solar rebate program to reduce peak load and offset customer electricity bills. In support of Senate Bill 1 (SB1) RPU has allocated a budget of $2.5 million annually through December 31, 2016 for customer installed systems. During FY 14/15, RPU issued rebates for 322 residential installations totaling 2301.03 kW AC and 5 non-residential systems generating 118.18 kW AC of renewable solar energy.
- SHARE – This low income assistance program credits up to $150 toward electric deposit or bill payment assistance for qualified low-income applicants annually. In FY 14/15, RPU served approximately 5000 low income customers through the SHARE program for a total of over $750,000 in Public Benefit Funds credited to low income families for bill payment assistance.
- Research, Demonstration and Development (RD&D) – RPU continues to invest in RD&D programs through partnerships with both businesses and local higher education institutions. RPU has expended over $1,000,000 in Public Benefit Funds over the last ten years through its Energy Innovation Grant Program (see description above) to support energy research at local institutions of higher learning. Additional RD&D funding is provided to local commercial customers under the Custom Energy Technology Grant Program (see description above). RPU also participates in SCPPA directed RD&D efforts and will continue to explore future RD&D opportunities as they occur on a case by case basis.
- Demand Response – RPU continues to manage a highly successful voluntary demand response program. This program, known as Power Partners, was developed in partnership with RPU's

largest commercial customers. These important Key Account customers agree to voluntarily shed or shift a combined total of 11 MW of electric load during the peak summer months from June-September if it is deemed necessary to call on this resource by RPU in cooperation with the CAISO.

- Pool Pump Timer Credit Load Shift Program – This program offers a bill credit of $5 per month for customers who agree to install and program their residential pool pump timer so that the pump operates only during off-peak hours. RPU has implemented an ongoing inspection program to inspect 100% of these timers for program compliance.
- GreenLite LED Retail Buy-down Program – This program was created in FY 14/15 and implemented in FY 15/16. RPU uses Public Benefit Funding to contract with GreenLite to buy-down the retail cost of certain LED bulbs at participating local retailers to incentivize customers to purchase and install these high efficiency lighting products in their homes and businesses.

RIVERSIDE PUBLIC UTILITIES – FY 2014/2015 ENERGY EFFICIENCY RESULTS

Riverside		Resource Savings Summary									Cost Summary			
Program Sector (Used in CEC Report)	Category	Units Installed	Gross Coincident Peak Savings (kW)	Gross Annual Energy Savings (kWh)	Gross Lifecycle Energy Savings (kWh)	Net Coincident Peak Savings (kW)	Net Annual Energy Savings (kWh)	Net Lifecycle Energy Savings (kWh)	Net Lifecycle Gas Savings (MMBtu)	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)	Utility ($/kWh)
Appliances	Res Clothes Washers	1,073	171	66,526	798,312	145	56,547	678,565		404	$80,475		$80,475	$0.16
HVAC	Res Cooling	17,902	1,308	3,839,992	111,633,239	975	2,739,136	78,941,679		50,931	$611,072		$611,072	$0.01
Appliances	Res Dishwashers	596	63	18,476	203,236	53	15,705	172,751		102	$29,800		$29,800	$0.22
Consumer Electronics	Res Electronics	592	8	65,712	262,848	7	55,855	223,421		127	$82,750		$82,750	$0.41
HVAC	Res Heating													
Lighting	Res Lighting	5,401	219	209,701	3,060,965	208	197,525	2,891,007		1,640	$91,460		$91,460	$0.04
Pool Pump	Res Pool Pump	158	5	106,492	1,064,920	3	63,895	638,952		382	$31,600		$31,600	$0.06
Refrigeration	Res Refrigeration	3,036	297	1,395,352	8,491,746	266	1,247,921	7,533,494		4,252	$308,802		$308,802	$0.05
HVAC	Res Shell	522	96	158,731	3,057,738	79	117,393	2,272,045		1,353	$61,364		$61,364	$0.04
Water Heating	Res Water Heating	4		3,372	35,856		2,201	23,828		14	$500		$500	$0.03
Comprehensive	Res Comprehensive	32,563	1	1,270,531	15,267,561	1	1,179,033	14,256,810		8,487	$353,272		$353,272	$0.03
Process	Non-Res Cooking													
HVAC	Non-Res Cooling	445	66	277,954	4,914,755	60	259,156	4,578,052		2,899	$162,866		$162,866	$0.05
HVAC	Non-Res Heating													
Lighting	Non-Res Lighting	2,392	180	11,555,691	114,628,588	170	10,515,553	104,272,698		61,758	$1,323,228		$1,323,228	$0.02
Process	Non-Res Motors	1		1,143,601	14,866,811		1,143,601	14,866,811		8,286	$1		$1	
Process	Non-Res Pumps													
Refrigeration	Non-Res Refrigeration	27	15	615,415	3,700,602	14	584,525	3,514,046		1,958	$216,455		$216,455	$0.07
HVAC	Non-Res Shell	531	89	156,104	2,606,056	75	132,688	2,215,148		1,345	$78,238		$78,238	$0.05
Process	Non-Res Process													
Comprehensive	Non-Res Comprehensive	82	10	2,697,082	26,514,194	9	2,561,108	25,185,046		15,297	$257,279		$257,279	$0.01
Other	Other													
SubTotal		65,325	2,527	23,580,732	311,107,427	2,066	20,871,842	262,264,353		159,235	$3,689,162		$3,689,162	$0.02
T&D	T&D													
Total		65,325	2,527	23,580,732	311,107,427	2,066	20,871,842	262,264,353		159,235	$3,689,162		$3,689,162	

EE Program Portfolio	TRC Test	**2.42**
	PAC Test	**10.25**

Excluding T&D

ROSEVILLE ELECTRIC

Roseville Electric (RE) At a Glance

- Established in 1912 as a department of the City of Roseville.
- Climate Zone 11.
- 57,137 retail customers served.
- Fiscal year calendar ending June 30.
- Percent of retail sales by customer class – residential 44%, commercial 42%, industrial 14%.
- Roseville Electric budgeted $4.7 million for Public Benefit programs on estimated revenues. Final revenues funded the mandated collection of 2.85%, $4,444,249 and provided additional funding of $493,420 (.32%) for Public Benefit programs.

RE Overview

Roseville Electric (RE) and the City of Roseville are prime economic drivers in the south Placer County region. Roseville Electric is challenged with balancing a rate structure that encourages energy efficiency and investment in solar technology while meeting the demands of a very diverse customer base.

Roseville Electric continues to support customer willingness to embrace new energy efficiency and PV technology and opportunities through innovative programs such as LED lighting, new home construction, contractor managed energy audit programs, solar leasing and power purchase agreements. We continue to evaluate opportunities through advanced metering, electric vehicles, energy storage and community solar.

Roseville Electric also acknowledges the need to meet consumer desire for a broad range of energy efficiency measures suitable for the full spectrum of customers and evaluates program cost effectiveness as a portfolio.

Beginning in FY 15, Roseville Electric began measuring the cost effectiveness of our portfolio of programs using Roseville avoided costs in the E3 model in place of the default PG&E costs. This adjustment has resulted in a lower but more representational Total Resource Cost (TRC) metric of our energy efficiency programs, reducing the portfolio TRC from 2.94 to 1.02.

Major Program Changes

Several major program changes occurred at Roseville Electric during FY 15. These changes were all driven by regulatory requirements and market and technology changes within the electric utility industry.

- Behavioral Programs: Roseville Electric fully embraced “behavioral based” energy efficiency programming for residential customers with the implementation of *O Power Home Energy Reports*. Energy savings for the first full year of the program generated 33% of total portfolio savings, 2,992,392 kWh from 17,513 residential participants.

- LED Lighting: Indoor and outdoor LED lighting products were offered to Roseville customers in FY 15 through utility and contractor managed install commercial programs and to residential customers through a vendor managed upstream retail program. The combined LED programs contributed 35%, 3,134,177 kWh to the Roseville portfolio.

- Limitations on Staff Time: The increasing demands on staff time from customer utilized solar electric (PV) has reduced the overall staff time available for energy efficiency programs. Roseville Electric interconnected 717 retrofit and new home customers in FY 15, one of the highest in the continental United States when measured by customers with solar as a percentage of total customers. Each PV application and interconnection requires significant public benefits staff time to complete. This detracts from our ability to focus on energy efficiency program development and implementation. As Roseville's solar has increased, so has our need to monitor and manage pre and post installation custom violations of Roseville's Rule 21 Interconnection Standards, further impacting time spent on energy efficiency.

Program Highlight

LED Lighting : RE introduced a variety of LED lighting options to Commercial and Residential customers in FY 15 resulting in annual savings contributed from LED programs of 35%, 3,134,177 kWh. RE has assumed a baseline of incandescent for all LED lighting programs as customers did not readily adopt CFL technology.

- Residential: RE introduced LED lighting technology to residential customers through a vendor managed upstream lighting program delivered through local retailers. The LED retail program was well received by our residents and resulted in 1,651,063 kWh savings at a cost of $374,712.

- Commercial: RE introduced LED outdoor lighting technology to commercial customers and expanded indoor lighting measures for commercial customers. This resulted in 1,483,114 kWh savings at a cost of $231,319.

O Power: RE launched the O Power Home Energy Reports program to 17,513 residential customers. The first full year of savings from the program totaled 2,992,392 kWh, 33% of total reported annual savings.

Rapid Audit: RE contracted with a vendor to provide outreach and energy audit services to the small and mid-size commercial customer base beginning in FY 13 and extended this service to multifamily residents and common areas in FY 14 and 15. In FY 15 RE performed 1098 energy audits for apartment residents. The audits resulted in the installation of lighting measures for some residents. The combined savings of audits and lighting measure installations to these hard to reach customers contributed 675,200 kWh to the RE portfolio. The reported savings were adjusted to reflect knowledge gained from EM&V of the program in FY 14.

Program Descriptions

Residential HVAC: encourages customers to install higher efficiency systems upon retrofit.

Residential Shade Tree: rebate program designed to incent customers to plant shade trees to keep their home cool. There are two rebate levels and they are directly tied to the savings associated with each tree; trees are selected from the SMUD tree calculator. Due to the ongoing drought, we have suspended this program until conditions improve.

Residential Pool Pump: rebate program designed to incent customers to upgrade from a single speed to a variable speed pool pump.

Residential Sunscreens: rebate program designed to incent customers to install permanent sunscreens on their windows to keep their home cool.

Residential New Construction: program that incents two paths. Preferred homes must achieve 20% better cooling efficiency than code while the BEST (Blueprint for Energy and Solar Technology) Homes must achieve 15% total efficiency above code and include a Photovoltaic system.

Residential Interior LED Lighting: Upstream, vendor managed program providing discounted LED lamps through local retail outlets in Roseville.

Multi Family Audit: a no cost audit to identify energy saving opportunities. This program is paperless and provides a communication channel with the customer.

Multi Family Lighting: a direct install program that is no cost to the customer. Incandescent lamps are retrofit with low wattage CFLs.

Commercial Lighting: offers business customers a wide variety of energy efficient non LED lighting retrofits and control options for updating their facilities.

Commercial LED Indoor and Exterior Lighting: introduces business customers to a wide variety of new LED technology options in lighting for indoor and outdoor use.

Commercial HVAC: includes package and split system retrofits along with several measures to reduce heat gain in the facility, including shade trees, window film and VFD and VSM retrofits to existing HVAC supply and return fans.

Commercial Audit: a no cost audit to identify energy saving opportunities, small business customers specifically. This program is paperless and provides a communication channel with the customer.

Commercial Audit Lighting: a direct install program that is no cost to the customer, small business customers specifically. Incandescent lamps are retrofit with low wattage CFLs and an LED "Open" sign to replace older, inefficient models.

Commercial New Construction: a program that is based on current Title 24 requirements. The designed structure must exceed Title 24 specifications by at least 10%. The rebate is based on KW reduced in the design.

Commercial Shade Trees: custom program based on the SMUD tree calculator. Two rebate levels based on tree selection. Due to the ongoing drought, we have suspended this program until conditions improve.

Commercial Custom: this customer driven rebate option targets projects that reduce peak loads and energy consumption and offers unlimited energy efficiency technology opportunities for the large and key account customers

EM&V

RE has a five year plan for M&V and EM&V of all public benefit programs. EM&V is generally performed annually on one or two programs. Selection of the programs to EM&V is prioritized by the dollars spent and savings claimed for the program. The budget for pre and post EM&V is based on the program selected for review and can vary from $20,000 up to $150,000. The budget depends on the extent of field measurement or customer surveys required to fully evaluate the program within the guidelines established by the California Energy Commission.

For FY 14-15, Roseville Electric opted to perform a two year pre and post EM&V of residential programs. The pre EM&V study performed for FY 14-15 measured HVAC cooling hours for Climate Zone 11. This study will be used to complete a full EM&V of residential programs for FY 15-16.

M&V is performed internally or by a third party contractor on an ongoing basis for all programs.
All EM&V reports are posted on the Northern California Power Agency (NCPA) website.
Recommendations resulting from EM&V and M&V reports are used by RE in the design and/or redesign of energy efficiency programs. www.ncpa.com/policy/reports/emv

- Shade Trees (2010)
- Large Commercial Lighting (2011)
- New Construction Homes (2012)
- HVAC Right Size (2013)
- Small Commercial and Multi Family Rapid Audit and Install (2014)

Sources of Energy Savings

RE relies on the savings in the E3 model provided by the TRM or DEER. If not available, the measure is entered to the E3 model as a custom measure. When a custom program is entered to the E3 model, the source of energy savings comes from a white paper, prior EM&V or a manual watt to watt calculation using customer provided hours and baselines. RE relies on customer hours for some industries if they are more realistic in actual application than the hours in the TRM.

LED Lighting: RE relies on TRM LED lighting measures if available in the E3 model; otherwise RE relies on industry specs for watts and replacement data (incandescent or cfl) and calculates savings using the TRM hours of operation and replacement of incandescent lighting as the baseline.

Residential HVAC: RE contracted with Nexant to measure HVAC cooling hours for Roseville during the 2015 summer. The Equivalent Full Load Hours measured for Roseville (524) was used to calculate the savings reported for Residential HVAC for FY 2015. This pre EM&V study will be published on the NCPA website in conjunction with the EM&V report Nexant will complete for RE in 2016.

New Home Development Agreements: RE is involved in all specific plan negotiations with new home builders in Roseville and is able to enforce the requirement that all new home builders install HVAC systems with higher 15 SEER/12 EER HVAC systems. These savings were calculated based on the savings in the E3 TRM for a 15 SEER/12 EER, 4 ton HVAC system for 638 homes completed in FY 15.

New Home Construction Rebate Program: RE influences the construction of new homes in Roseville by providing rebates to participating builders. The savings are calculated using the Title 24 reports submitted for each participating village.

Complimentary Programs

- Renewable Energy Programs: RE rebated $944,890 on residential and commercial solar systems in FY 2015 adding 717 new systems. This increased installed solar to 2,472 systems with a capacity of 8.6 MW.

- Low-Income Programs: RE offers several rate assistance programs for qualified low income residential customers. Approximately 1,500 residents benefit from this program. Scholarships are provided through the Utility Exploration Center for Title 1 schools to offset the costs for field trips to the UEC.

- Research, Development and Demonstration: RE participated in four RD&D programs in FY 15 including:
    - City of Roseville Utility Exploration Center: a 4000 sq. ft. facility with the mission to educate ratepayers and school children about water and energy conservation and a sustainable lifestyle. In support of this mission, RE contributes to the development and maintenance of

exhibits through annual contributions to the center. In FY 15, the Exploration Center hosted 36,444 visitors including 7,107 students. In FY 15, RE contributed $279,054 for exhibits and school programs and $4,423 for scholarships for students.

- APPA DEED: DEED is dedicated to increasing energy efficiency, reducing costs, investigating new technologies and improving utility operations and services. RE contributed $2,524 to the DEED program in FY 15.
- California Lighting and Technology Center: The CLTC is a collaborative effort between the California Energy Commission, the U.S. Department of Energy and the National Electrical Manufacturers Association to advance energy efficient lighting and day lighting technologies. The goals of the CLTC are accomplished through partnership with utilities, lighting manufacturers, end users, builders, designers, researchers and government agencies. It was established in 2003 at the University of California, Davis. In FY 15, RE contributed $10,000 to the lighting center for ongoing R&D.

- Electric Vehicles: RE continues to research and support the expansion of electric vehicle charging stations in Roseville. In FY 15, we spent $15,462 to provide electricity and maintenance for three charging stations. The three charging stations are strategically located in the downtown parking center near the Vernon Street outdoor event plaza and in the Roseville Galleria, a regional shopping center in close proximity to highways 65 & 80.

ROSEVILLE ELECTRIC – FY 2014/2015 ENERGY EFFICIENCY RESULTS

Roseville		Resource Savings Summary									Cost Summary			
Program Sector (Used in CEC Report)	Category	Units Installed	Gross Coincident Peak Savings (kW)	Gross Annual Energy Savings (kWh)	Gross Lifecycle Energy Savings (kWh)	Net Coincident Peak Savings (kW)	Net Annual Energy Savings (kWh)	Net Lifecycle Energy Savings (kWh)	Net Lifecycle Gas Savings (MMBtu)	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)	Utility ($/kWh)
Appliances	Res Clothes Washers													
HVAC	Res Cooling	3	506	467,428	7,011,420	506	467,428	7,011,420			$318,500	$62,239	$380,739	$0.07
Appliances	Res Dishwashers													
Consumer Electronics	Res Electronics													
HVAC	Res Heating													
Lighting	Res Lighting	2	3,344	2,035,130	30,526,950	3,344	2,035,130	30,526,950			$545,783	$232,647	$778,430	$0.03
Pool Pump	Res Pool Pump	294	113	503,034	2,665,453	113	503,034	2,665,453			$58,800	$20,433	$79,233	$0.03
Refrigeration	Res Refrigeration	572	71	354,053	1,729,756	71	354,053	1,729,756			$28,600	$55,396	$83,996	$0.05
HVAC	Res Shell	12,359	11	518,744	10,261,520	11	518,744	10,261,520			$130,004	$80,045	$210,049	$0.03
Water Heating	Res Water Heating													
Comprehensive	Res Comprehensive	2	2,937	2,608,877	2,665,927	2,937	2,608,877	2,665,927			$30,240	$200,218	$230,458	$0.09
Process	Non-Res Cooking	1	1	4,486	67,290	1	4,486	67,290			$2,800	$437	$3,237	$0.06
HVAC	Non-Res Cooling	39	6,181	219,981	2,695,235	6,181	219,866	2,693,514			$230,375	$21,338	$251,713	$0.12
HVAC	Non-Res Heating													
Lighting	Non-Res Lighting	4	434	1,660,826	24,845,860	434	1,660,826	24,845,860			$257,321	$162,930	$420,251	$0.02
Process	Non-Res Motors													
Process	Non-Res Pumps													
Refrigeration	Non-Res Refrigeration	3	1	5,899	70,788		3,687	44,248			$1,200	$279	$1,479	$0.04
HVAC	Non-Res Shell													
Process	Non-Res Process													
Comprehensive	Non-Res Comprehensive	1	55	141,056	1,410,560	55	141,056	1,410,560			$29,204	$9,322	$38,526	$0.03
Other	Other													
SubTotal		13,280	13,654	8,519,514	83,950,759	13,654	8,517,188	83,922,498			$1,632,827	$845,285	$2,478,112	$0.04
T&D	T&D													
Total		13,280	13,654	8,519,514	83,950,759	13,654	8,517,188	83,922,498			$1,632,827	$845,285	$2,478,112	

EE Program Portfolio	TRC Test	**1.02**
	PAC Test	**1.45**

Excluding T&D

SACRAMENTO MUNICIPAL UTILITY DISTRICT

SMUD at a Glance

- Year established: 1946
- Climate Zone: 12
- Total Customers (year-end): 622,204
- Percent of retail sales by customer class – 47% residential, 53% commercial/industrial/other
- SMUD spent $36.7 million for residential and commercial energy-efficiency programs, compared to a budget of $37.5 million.[1] All expenditures are public-goods funded.

SMUD Overview

SMUD is planning program changes to respond to the following industry trends and changing customer expectations:

- Dozens of new companies now provide products and value-services that involve devices networked through the utility meter, WiFi, or cellular bands.
- LEDs: Prices are declining rapidly due to a combination of increased economies of scale, manufacturing technology improvements, and competition.
- The Comprehensive Energy Efficiency Program for Existing Buildings authorized by AB 758 will ultimately generate new utility data reporting requirements, additional building assessment and rating tools and requirements, an increased emphasis on efficiency code compliance during retrofits, focus on building industry training programs, and potential requirements for utilities to finance building upgrades.
- As part of the Comprehensive Energy Efficiency Program (AB758), we can expect a greater emphasis on building benchmarking and other building rating tools to communicate building performance and identify opportunities for building improvements.
- Residential rates will begin to mimic commercial rates at SMUD, with a movement toward TOU rates. This will place a greater focus on measures that impact peak demand and load management strategies.
- More and more customers prefer to access information and communicate via mobile devices.
- Consumers are becoming increasingly interconnected, fundamentally shifting channels of social interaction.
- Customers want clear and simple choices

Major Program Changes

The overall budget, energy and peak savings achieved in 2015 were relatively unchanged from 2014. But the following program changes were made to facilitate customer demand and prepare for the future:

- The Retail Lighting program was able to deliver approximately the same savings (over 60GWh) both years, but with a significant change to the product mix. The program went from a product mix

[1] Includes market research, planning, M&V, and emerging technologies R&D.

of 40% LEDs and 60% CFLs in 2014 to a product mix of 60% LEDs and 40% CFLs in 2015. The program was able to accomplish this by lowering the incentives to both CFLs and LEDs.

- In conjunction with roll-out of My Energy Tools using an OPower platform, SMUD re-introduced Home Electricity Reports to 50,000 customers. 12,000 of the customers receive the reports through email. The remaining 38,000 receive the traditional mail version. One-quarter of the reports are aimed at low income residential customers.
- The pool pump rebate component of the Plug Load program has been a traditional customer rebate program. This past year, SMUD has partnered with one of the large pool equipment supply retailers to provide Point-Of-Sale (POS) rebates for variable speed pool pumps. These POS rebates are different than the traditional POS rebates because the retailer does collect the customer's name and address, which provides SMUD better quality assurance and measurement and evaluation data.
- The majority of the commercial lighting programs were moved from the Custom Incentives program to the Express Efficiency Solutions program. Many of these projects were prescriptive in nature and facilitated an easy move into a more deemed savings approach. In addition to the movement of projects from one program to another, the Express Efficiency Solutions program grew by about 10% through contractor outreach and streamlining the smaller projects.

Program Highlight

While the Retail Lighting program reduced in size by about 5%, the program made tremendous strides in transferring into an LED only based program. Based upon the reduction of cost and the increased availability of LEDs, the expectation is to have an LED only program for the second half of 2016. The annual program mix will be 80% LED and 20% CFL for 2016, with an LED only program planned for 2017. LED light bulbs are a much better customer experience than CFLs. Customers can expect a higher quality light source with better startup characteristics and better overall controllability. Based upon the continued reduction in LED light bulb prices, the LED light bulb has become viable for nearly every light bulb in the typical house.

Program Descriptions

SMUD has been continuously operating energy-conservation, load management, and energy-efficiency programs since 1976. Over that time period, SMUD's customers have saved over 2 TWh of first year energy savings.

In 2007, the SMUD Board of Directors approved a significant expansion in annual savings goals for its energy-efficiency resources, from approximately 0.6% of annual sales to an annual average of approximately 1.5% over the following decade. These goals have now been extended through 2023. The expanded goals were part of the Board's vision to "empower our customers with solutions and options that increase energy efficiency, protect the environment, reduce global warming, and lower the cost to serve our region." SMUD is continually redesigning its energy-efficiency portfolio to expand existing programs, plan

and implement new programs, and develop and implement a broader marketing and engagement plan that will meet these expanded goals and the Board's vision.

For 2015, SMUD spent $36.7 million for residential and commercial energy-efficiency programs, compared to a budget of $37.5 million.[2] All expenditures are public-goods funded. These programs delivered 26.7 megawatts (MW) of peak-load reduction and 179.8 million kilowatt-hours (GWh) of annual energy savings, compared to annual goals of 25.5 MW and 175.40 GWh.

For 2016, residential and commercial energy-efficiency programs, SMUD has budgeted $37.3 million in PG funds.[3] These programs are projected to deliver 28.54 MW of peak-load reduction and 158.0 GWh of annual energy savings.

Commercial/Industrial Retrofit Programs

Expenditures for commercial/industrial energy efficiency retrofit programs for existing buildings and facilities were $18.3 million, with goals of 13.0 MW of peak-load reduction and 91.1 GWh in annual energy savings.

- Customized Energy Efficiency Incentives: Promotes the installation of energy-efficient equipment, controls, and processes at commercial and industrial customer facilities. Provides incentives to contractors and/or customers to promote the installation of energy efficient lighting, HVAC, motors, and refrigeration equipment and controls. The program also provides incentives for retro-commissioning, process improvements, and data center storage projects that result in energy savings.
- Express Energy Solutions: Provides prescriptive incentives to participating qualified contractors for high-efficiency equipment across a variety of end-uses: lighting, HVAC, refrigeration, food-service equipment, and office-network PC power-management software. Incentives are targeted to the contractor/supplier in an effort to stimulate the market for energy-efficient equipment and services, and are designed to cover a significant portion of the incremental cost of the equipment.
- Complete Energy Solutions: Third party administrator performs comprehensive energy audits of small and medium-sized businesses. Customer receives a customized report detailing recommended energy improvements, estimated savings, estimated cost and payback. Third party administrator then assist customer in hiring a contractor to complete the project.
- Savings by Design: Provides incentives to builders and their design teams to design new commercial and industrial buildings 10-30 percent more energy efficient than required by Title 24 (or typical new construction in the case of Title 24-exempt buildings and processes).
- Prop 39 Schools Program: SMUD has taken the position of a trusted advisor with regard to the Prop 39 funding that has been made available to schools for retrofit projects. Instead of a traditional rebate program, SMUD has provided consultant services to help facilitate the local school districts' access to the Prop 39 funds. Since we still have aided with projects and the

[2] Includes market research, planning, M&V, and emerging technologies R&D.
[3] Includes market research, planning, M&V, and emerging technologies R&D.

schools are using Prop 39 funding, we have included our costs in our reporting, but we have not added the schools cost for the projects as participant costs.

Residential Programs

Expenditures for residential energy-efficiency programs for existing homes were $18.4 million and achieved 12.5 MW of peak-load reduction and 80.8 GWh in annual energy savings.

- Shade Trees: Provides free shade trees to SMUD customers. Implemented through the community-based non-profit Sacramento Tree Foundation (STF). STF foresters review tree selection and site locations with customers, who plant the trees.
- Equipment Efficiency: Provides rebates and/or SMUD financing for qualifying (Energy Star, Consortium for Energy Efficiency, and/or other high-efficiency) efficiency improvements to homes' building shells and equipment. Improvements include central air conditioners and heat pumps, windows, heat pump water heaters, and cool roofs.
- Home Performance Program: Participating contractors use building-science principles and diagnostic equipment to evaluate the current performance of the whole house, and then recommend comprehensive improvements that will yield an optimal combination of savings and comfort for homeowners. Once the homeowner selects the improvements that fit their needs and budget, participating contractors will do the work to Building Performance Institute standards.
- Appliance Efficiency: Provides rebates for qualifying (Energy Star or Consortium for Energy Efficiency-listed) appliances: clothes washers, dishwashers, refrigerators, and room air-conditioners. Included in this program are two previously separate programs. Refrigerator/Freezer Recycling provides rebates for the free pick-up and environmental recycling of old refrigerators and freezers. Pool Pump rebates are available to customers and contractor for installing high-efficiency variable-speed pool pumps. The pool pump program also focuses on educating the pool-contractor community on practices for retrofit and new-pool installations that maximize pumping efficiency and minimize energy use and peak demand.
- Retail Lighting: Promotes energy efficient residential lighting products by providing incentives for manufacturers and their retail partners to sell Energy Star lighting at a discount. Implemented through agreements with manufacturers and retailers that involve cost buy-downs, marketing, and/or advertising. SMUD has been steadily increasing the percentage of LED bulbs rebated through this program.
- Multi-Family Retrofit Program: The Multifamily (MF) Retrofit Program contains two distinct options for MF property owners: (1) Home Performance Program for Multifamily (HPP-MF) Rebates, which provide comprehensive retrofit of existing MF buildings (such as at least two changes to an existing building's envelope, electric water-heating system, space-conditioning system, or lighting system); and (2) Prescriptive MF Rebates, which is offered to MF property owners who are not willing or able to invest in major comprehensive energy efficiency improvements.
- Smart Homes- New construction program that integrates energy efficiency, demand response and other technologies in an aligned vision. The program is designed to complement SMUD's other portfolio programs (EE, DR, EV, etc.) to support SMUD's future load requirements. The resulting

home design from those builders that participate will be an innovative use of energy-efficient design technologies, integrated built-in DR capabilities, automated peak shifting strategies, and other "smart" connected options desired by homeowners.

Information/Education Programs

Expenditures for information and Education programs were $741,000 in 2015 with 1.2 MW of peak-load reduction and 7.95 GWh in annual energy savings.

- Home Electricity Reports: A scientifically designed program to measure the impact of sending electricity-usage reports to residential customers. The reports compare the customer's monthly usage to that of the previous year and to about 100 neighbors in similar-size homes with the same heat energy source. The reports are customized to each house and provide energy tips to assist the customer in making behavior changes that reduce their energy use.
- Residential Advisory Service: Provides on-site energy audits of homes, on-line energy audits, and telephone assistance for customers, with recommendations to reduce their homes' energy use (and bills). Recommendations include practices and home-improvement projects that will increase the energy efficiency of their dwellings.

Demand-Reduction Programs

- Residential Air Conditioner Load Management Program: In the past, customers volunteered to allow SMUD to install a radio-controlled cycling device on their central air conditioners, and to send a radio signal that switches or cycles off their air conditioners during an electric-system emergency. In the late 1990's the program was transitioned over into maintenance mode with installation being stopped and then in 2010 the program was shut down and all service and maintenance related work was discontinued. In an Emergency Situation the Power System Operators do have the ability to activate the entire ACLM cycling program within a 3 minute time span.
- Residential PowerStat Program: PowerStat is a "customer choice" model for residential customers giving them more options to manage their energy costs as well as providing comfort and convenience. The PowerStat pilots included a variety of customer tests with varying degrees of incentives and temperature setbacks, with different limitations on event overrides.
- Power Direct (Automated Demand Response Program): Enhances facilities' energy performance by seamlessly integrating automated response capabilities into energy management, lighting and HVAC systems. Automatically reduces electricity consumption on Conservation Days in times of high demand.

EM&V

In concert with its commitment to significantly ramp up energy-efficiency activities over the next decade, SMUD has established a framework to develop yearly measurement and verification (M&V) action plans. SMUD is planning M&V activities for all of its major programs, scheduled at fixed intervals (2-4 years apart), with the intention of evaluating all programs on a continued cyclical basis through 2020. For methodological approaches needed to perform specific types of evaluations, SMUD will be guided by the

CPUC's "California Evaluation Framework" (June 2004) and "California Energy Efficiency Evaluation Protocols" (April 2006).

SMUD is planning to allocate approximately one percent of its total energy-efficiency budget towards impact- and persistence-focused M&V studies. These studies will be conducted primarily through the use of third-party contractors, with management and oversight by SMUD's Business Planning Department. SMUD completed the following M&V activities in 2015:

- Commercial Lighting Program
- Residential Lighting Program
- Refrigerator/Freezer Recycling

In 2016, M&V will be conducted for the following:

- Savings by Design
- Pool Spa and Pump
- Energy and Technology Center

Sources of Energy Savings

In order to determine energy savings, programs may rely on several sources: the Database for Energy Efficient Resources (DEER), TRM, Energy Modeling Software, or specific studies conducted by utilities or recognized working groups. The goal is to use the most current studies/workpapers which best represent CZ12 and SMUD customers.

Complimentary Programs

- Renewable Energy Programs: Incentives for net-energy-metered PV; a feed-in tariff for mid-scale systems (currently closed); voluntary green pricing programs including SolarShares, which supports expansion of distributed PV; commercial and residential REC purchase programs; and a community solar program aimed at enhancing K-12 curricula on renewable energy.
- Low-Income Programs: SMUD provides a low-income rate subsidy, a medical assistance rate subsidy, and no-cost weatherization services to our low-income customers.
- Research, Development, and Demonstration: SMUD has a centralized research and development program that conducts public good research across the electricity enterprises from the supply side to demand side. With an annual budget of approximately $10.8 million, research is conducted in eight research areas which include renewable energy, electric transportation, climate change, distributed generation, energy efficiency, demand response, storage and smart grid. These programs seek to track emerging technologies, demonstrate promising technologies and prepare SMUD and SMUD customers for adoption of these emerging technologies.
- Codes & Standards: SMUD continues to assist with the development and implementation of codes and standards (e.g. T24, T20, etc.). SMUD participates in several working groups, drives code compliance through programs, assists with workforce training, conducts research, and develops data management systems to improve tracking and reporting.

- Electric Vehicles: In 2015 SMUD's Drive Electric program promoted adoption of plug-in electric vehicles through special PEV rate offerings, participation in educational events, educational offerings through our website SMUD.org/PEV, and collaboration with local auto dealers and the local EV advocacy group Sac EV. SMUD's coordination of a large scale Ride-N-Drive event at the Sacramento International Auto Show resulted in over 900 test drives of plug-in electric vehicles and was one highlight of our PEV education efforts.
- Energy Storage: SMUD conducted field studies to examine grid-scale storage applications, risks and benefits. Additionally, residential applications for storage combined with renewable generation and dynamic pricing were also tested in a midtown Sacramento new construction development.

SACRAMENTO MUNICIPAL UTILITY DISTRICT – FY 2014/2015 ENERGY EFFICIENCY RESULTS

SMUD		Resource Savings Summary									Cost Summary			
Program Sector (Used in CEC Report)	Category	Units Installed	Gross Coincident Peak Savings (kW)	Gross Annual Energy Savings (kWh)	Gross Lifecycle Energy Savings (kWh)	Net Coincident Peak Savings (kW)	Net Annual Energy Savings (kWh)	Net Lifecycle Energy Savings (kWh)	Net Lifecycle Gas Savings (MMBtu)	Net Lifecycle GHG Reductions (tons)	Utility Incentives Cost	Utility Mktg, EM&V, and Admin Cost	Total Utility Cost	Utility ($/kWh)
Appliances	Res Clothes Washers	203	6	76,600	1,149,000	5	68,940	1,034,100		452	$4,364	$14,327	$18,690	$0.03
HVAC	Res Cooling	15,849	2,599	3,818,600	57,279,000	2,599	2,673,020	40,095,300		22,519	$2,294,821	$1,499,082	$3,793,903	$0.10
Appliances	Res Dishwashers													
Consumer Electronics	Res Electronics	3,055	215	640,000	6,400,000	194	576,000	5,760,000		2,516	$36,458	$119,703	$156,161	$0.06
HVAC	Res Heating													
Lighting	Res Lighting	1,682,060	4,690	62,000,000	514,600,000	4,221	55,800,000	463,140,000		202,310	$5,957,994	$1,633,604	$7,591,598	$0.01
Pool Pump	Res Pool Pump	1,077	37	1,840,000	27,600,000	35	1,748,000	26,220,000		10,851	$104,816	$344,146	$448,962	$0.03
Refrigeration	Res Refrigeration	6,526	837	6,064,800	26,586,284	837	3,638,880	15,951,770		10,452	$345,483	$1,134,335	$1,479,818	$0.03
HVAC	Res Shell	61,960	15	37,000	740,000	15	22,200	444,000		291	$25,146	$6,978	$32,125	$0.08
Water Heating	Res Water Heating	110	21	303,000	6,060,000	20	287,850	5,757,000		2,382	$205,927	$57,147	$263,074	$0.09
Comprehensive	Res Comprehensive(a)	3,446	5,290	13,970,000	80,692,756	5,290	13,271,500	76,658,118		31,724	$2,937,524	$1,652,017	$4,589,541	$0.08
Process	Non-Res Cooking													
HVAC	Non-Res Cooling	31	1,014	5,807,416	87,111,246	1,014	5,226,675	78,400,121		34,247	$364,038	$259,918	$623,957	$0.01
HVAC	Non-Res Heating													
Lighting	Non-Res Lighting	1,320	8,988	54,670,159	218,680,635	8,090	49,203,143	196,812,572		85,972	$8,072,867	$4,040,750	$12,113,617	$0.03
Process	Non-Res Motors													
Process	Non-Res Pumps													
Refrigeration	Non-Res Refrigeration	165	314	5,832,943	58,329,431	314	5,249,649	52,496,488		22,932	$998,332	$991,748	$1,990,080	$0.05
HVAC	Non-Res Shell													
Process	Non-Res Process	30	670	9,687,500	96,875,000	603	8,718,750	87,187,500		38,086	$509,369	$320,521	$829,890	$0.01
Comprehensive	Non-Res Comprehensive(b	48	1,994	15,101,982	132,030,980	1,994	13,591,783	118,827,882		51,907	$1,036,725	$1,692,742	$2,729,467	$0.02
Other	Other(c)													
SubTotal			26,690	179,850,000	1,314,134,332	25,230	160,076,390	1,168,784,852		516,640	$22,893,865	$13,767,020	$36,660,884	$0.03
T&D	T&D													
Total			26,690	179,850,000	1,314,134,332	25,230	160,076,390	1,168,784,852		516,640	$22,893,865	$13,767,020	$36,660,884	

EE Program Portfolio TRC Test (d)	**1.09**
EE Program Portfolio PAC Test (d)	**2.39**

Excluding T&D

SAN FRANCISCO PUBLIC UTILITIES COMMISSION

San Francisco Public Utilities Commission (SFPUC) Power Enterprise At a Glance

- Providing electricity to customers since 1925
- Located in Climate Zone 3
- Serving approximately 2,400 retail customer connections
- Customer classes: Approximately 40% of retail electricity is supplied to San Francisco municipal customers in the "General Fund" rate class, consisting primarily of nonresidential buildings, process loads, and streetlights. The remaining retail electricity is supplied to customers in the "Enterprise" rate class, which are primarily municipal nonresidential buildings, tenants on municipal property, multi-tenant residential buildings, and process loads.[4]
- FY 2014-15 total electricity sales to retail customers: 949,000 megawatt-hours (MWh); peak demand: 149 megawatts (MW); load growth is negligible
- In FY 2014-15, the Power Enterprise appropriated $782,000 in utility ratepayer revenues and $218,000 in cap and trade proceeds for energy efficiency programs other than streetlights. Actual spending of utility revenues (reporting all project costs in the year of completion) totaled $2.5 million, plus ~$1 million in LED streetlight upgrades. Other public purpose programs include municipal renewable energy projects and the GoSolarSF solar incentive program.

Utility Overview

Power Enterprise manages a portfolio of electric generation, which includes the SFPUC's Hetch Hetchy Water and Power system, which generates an average of 1.6 million MWh of clean hydroelectric power each year, 20 municipal solar photovoltaic installations (8.0 MW), and 2 biogas cogeneration facilities (3.1 MW). Power Enterprise has made a commitment to energy efficiency as its highest priority resource.

Historically, Power Enterprise's energy efficiency programs mainly have targeted its municipal customers, and most of its programs have been provided at no charge to these civic agencies. Today, fee-for-service programs represent a growing portion of energy efficiency offerings. Power Enterprise is developing new programs for its growing residential and commercial customer sectors.

Major Program Changes

This year's energy savings are primarily derived from completion of a small number of comprehensive HVAC retrofits. Projects also resulted in substantial natural gas savings from boiler and central plant retrofits. Power Enterprise's fee-for-service Commissioning and Design Review program has continued to grow as part of the efficiency portfolio, and completed a large project at San Francisco International Airport in this reporting period. FY 2014-15 also marked the launch of a significant capital improvement program to convert Power Enterprise owned streetlights to LED technology, significantly reducing their energy usage. Spending for completed LED streetlight retrofits will become significant beginning FY 2016-17. Also, Power Enterprise plans to supplement its energy efficiency funding with proceeds from cap and trade funds.

[4] A small portion of sales are made to non-municipal residential and commercial customers located in redevelopment projects at Treasure/Yerba Buena Islands and Hunters Point that are served off of Power Enterprise operated distribution systems.

Program Highlights

Energy efficiency has been an essential component of Power Enterprise's resource portfolio for more than a decade. In the current reporting period, FY 2014-15, completed energy efficiency projects are estimated to save 1,619 MWh (net savings) of electricity per year, at a utility cost of $2.5 million. In addition LED streetlights capital investments are estimated to save 251 MWh at a cost of $991,000.

Overall program cost-effectiveness in FY2014-15 was significantly reduced due to two factors. Capital-funded LED streetlight investment negatively affected this year's portfolio cost-effectiveness as the total cost of the retrofits were included in reported expenditures, and this year's scope of pedestrian lighting improvements and decorative fixtures was particularly capital-intensive. Portfolio cost-effectiveness also was reduced due to reporting costs for Phase 2 of a large HVAC project at the Hall of Justice. Despite an overall 8.6 year payback for both phases, the majority of savings were reported last year in Phase 1 of the project which included building controls and heating upgrades. Phase 2 was completed in this reporting period and focused on replacement of the Chiller which had a greater share of costs and a smaller share of the savings.

Program level highlights for FY 2014-15 include:

- Direct-install style retrofits provided most of the electricity savings reported for this fiscal year including HVAC upgrades at a major parking garage, two fine arts museums, the Hall of Justice, and a Housing Authority residence.
- Power Enterprise provided design review for new construction, and commissioning for the Terminal 3, Boarding Area E renovation at San Francisco International Airport;
- 467 streetlights were replaced with LED technology. Power Enterprise plans to eventually convert 18,000 streetlights to LED;
- Power Enterprise's annual report benchmarking the energy performance of San Francisco's municipal buildings grew to include 465 buildings representing almost 49 million square feet of building area.

Energy Efficiency Program Descriptions (FY 2014-15)

Power Enterprise's energy efficiency programs are generally tailored to the particular customer's circumstances because most customers are large and have varied property characteristics. They include:

- Direct-Install Program: This program provides complete retrofit services to targeted municipal customers, usually at no cost to the customer. The program focuses on City agencies that are funded primarily through local tax receipts, fees, and federal/state-funded programs. These customers are considered hard-to-reach (due to limited access to capital and engineering, and to insufficient price signals).
- Civic Center Sustainability District: Through a partnership with the Clinton Global Initiative, this program demonstrates green, renewable and energy efficient technologies as a national model for sustainability in historic districts. For energy efficiency projects, the program provides free energy audits, design, construction management, construction services, and full funding to buildings in the City's historic district.
- LED Street Light Conversion Project: The capital-funded program aims to convert about 18,000 high pressure sodium street lights to LED lights. The program will reduce energy use

and maintenance costs, and improve pedestrian and vehicular safety. The project scope includes the installation of networked wireless controls, which will further reduce energy consumption via fixture dimming. The project launched in FY14-15. This year 467 streetlight fixtures were replaced with LEDs, with a projected annual electricity savings of 251,000 kWh.

- Green Commissioning and Design Review Program: Power Enterprise provides commissioning and related green building design review services on a fee-for-service basis for municipal new construction and major renovations. For existing buildings, the program offers retro-commissioning services.
- Energy Benchmarking Program: San Francisco requires owners of non-residential buildings over 10,000 square feet to annually benchmark and disclose the energy performance of their buildings. In 2014, Power Enterprise released its second annual report benchmarking the energy performance of San Francisco's municipal buildings, including 465 buildings representing nearly 49 million square feet of building area.

EM&V

Historically, the majority of energy efficiency retrofit projects funded by Power Enterprise have included an individual M&V study following the International Performance Measurement and Verification Protocol (IPMVP). These projects have included an M&V plan with a sampling plan, a logging plan, an approach to data recovery and analysis, and a written report.

Sources of Energy Savings

Power Enterprise's mostly-direct-install energy efficiency portfolio allows it to report energy savings based on site-specific engineering studies with detailed ex ante savings estimates. These studies base savings on on-site collected data for hours of operation, nameplate data for replaced equipment, and detailed site-specific costs.

Complementary Public Benefits Programs

Power Enterprise offers several related programs, among them:

- Renewable Energy Programs:
    - Municipal Renewable Program: Under this program Power Enterprise directly installs, maintains and operates solar PV systems on municipal buildings throughout the City and County of San Francisco; and
    - GoSolarSF: The program provides incentive payments to San Francisco residents and businesses installing rooftop solar projects. The program includes a component for low income residents, which complements a statewide program administered by Grid Alternatives, a nonprofit organization.

SAN FRANCISCO PUBLIC UTILITIES COMMISSION – FY 2014/2015 ENERGY EFFICIENCY RESULTS

San Francisco PUC Power Enterprise	Resource Savings Summary (1)(2)			Cost Summary (3)		
	Savings Summary (Completed Projects)					
	kW	kWh/yr	Lifecycle kWh	Utility Incentive & Direct Install ($)	Utility Mktg, EM&V and Admin OH (4)	Total Utility Cost
Program						
Direct Install (General Fund)	324	681,309	10,252,345	$ 1,833,418	$ 87,803	$ 1,921,221
Civic Center Sustainability District	42	776,970	11,654,550	$ 628,125	$ 139,153	$ 767,278
Commissioning and Design Review	228	160,929	3,218,580	$ -	$ 20,740	$ 20,740
LED Street Lights	0	251,380	3,770,698	$ 990,852	$ -	$ 990,852
Total	**595**	**1,870,588**	**28,896,173**	**$ 3,452,395**	**$ 247,696**	**$ 3,700,091**

(1) Energy Savings reported are "net savings".
(2) In addition to electricity savings, EE retrofits are expected to achieve significant natural gas savings.
(3) Costs for completed projects are reported in the year of completion. Some programs have no projects completing construction in FY2014-15.
(4) Annual Program Admin costs are apportioned based on percent of savings, excluding streetlights.

CITY OF SHASTA LAKE

City of Shasta Lake at a Glance

- Year established: 1993
- Climate Zone: 11
- Number of retail customers served: 4,494
- Percent of retail sales by customer class: 22% residential; 11% commercial 67% industrial
- Energy Efficiency Program Budget: $217,500; Energy Efficiency Program Expenditures: $282,027; funds may be reallocated to other PB programs depending upon program demands; the FY ended with $290,000 balance carried forward in the PB account
- Load growth: 0% (static; weather influenced)

City of Shasta Lake Overview

The CSL feels a significant responsibility to its community/ratepayers to invest their Public Benefits funds in such a way as to impact both energy and financial savings for their customers, and a positive economic impact in CSL as well. CSL offers a comprehensive menu of rebates to all of our customers. However, because of the economic downturn that has affected the City for several years, the number of customers taking advantage of the rebate offers have been relatively low.

To compensate for this, CSL has offered direct install programs that provide energy efficiency measures to customers at no cost to them. In FY15, CSL offered a Web Enable Programmable Thermostat (WEPT) direct install program to commercial customers that also included the installation of screw-in LEDs. The direct install programs continue to be very popular with CSL customers.

There were seven projects completed in CSL's Commercial Lighting Program. There was a large custom commercial project completed where a large, inefficient meat case was replaced with a new, efficiency model. CSL also provided direct install screw-in LED lamps to our commercial customers at no charge. A number of residential customers participated in the appliance, HVAC and weatherization rebate programs.

The rest of the energy savings result from a variety of appliance, residential weatherization, and residential HVAC measures.

Major Program Changes

There were no major changes to the programs in FY15. CSL emphasized programs aimed at commercial customers in FY15

Program Highlights

The EE actual program expenditures were 30% over budget. This was primarily due to CSL upgrading 698 of their HID streetlights to LED. CSL's energy efficiency programs and projects acquired net energy savings of 408,995 annual kWh's. The Commercial lighting program accounted for 52% of the energy savings.

The LEDs that were direct installed in commercial businesses accounted for 26% of the savings. Web enabled programmable thermostats (WEPTs) were a provisionally deemed measure with a high level of estimated energy savings. CSL offered a pilot to have this measure installed and then had the savings evaluated by ERS. The evaluated savings came in much lower than earlier estimates. CLS used the reduced savings from the ERS's EM&V report in the FY15 E3 tool.

The 408,995 kWhs acquired in FY15 represents 78% of CSL's AB2021 goal for the same year. The demand reduction of 46 kW's represents 32% of CSL's AB2021 goal for the same year. On a cumulative basis, CSL has met 64% of our three year AB2021 energy savings goal, and 35% of our three year AB2021 demand reduction goal.

Program Descriptions

CSL manages a comprehensive energy efficiency incentive program for residential & commercial customers focusing on peak load reduction and energy conservation. For residential customers, rebates are offered for the installation of various energy efficiency measures. For commercial customers, rebates are available for upgraded lighting, HVAC equipment and in cases where an energy analysis is performed, rebates can be offered for additional equipment that reduces energy use and/or demand.

- Residential Audit Program [Res Comprehensive]: On-site energy audits are provided by energy specialists. Energy efficiency measures are recommended and additional visits are completed upon request. Instant savings measures are also installed in customer homes (CFLs, showerheads, aerators)
- Residential Lighting Program [Res Lighting]: The City offers rebates to homeowners who install ENERGY STAR® qualified LEDs, ceiling fans and LED holiday lights.
- Residential Cooling Program [Res Cooling]: The City offers rebates to homeowners who install high performance heat pumps, central air-conditioners, or evaporative coolers that exceed current state requirements.
- Residential Equipment Program [Res Clothes Washers; Res Cooling; Res Dishwashers; Res Pool Pump; Res Refrigeration]: The City offers rebates to homeowners who purchase new ENERGY STAR qualified products, including clothes washers, room air conditioners, dishwashers, pool pumps, refrigerators and freezers.
- Residential Weatherization Program [Res Cooling; Res Shell]: The City offers rebates to homeowners who invest in weatherizing their homes, including air/duct sealing, attic/wall/duct insulation, window treatments/replacement, roof radiant barriers and cool roofs.
- Residential Water Heater Rebate Program [Res Water Heating]: The City offers rebates to homeowners who purchase a new, energy efficient electric water heater.
- Commercial Audit Program [Non-Res Comprehensive]: On-site energy audits are provided by energy specialists. Energy efficiency measures are recommended and additional visits are completed in order to provide technical assistance for implementation of measures. Energy efficiency rebates are available for upgrades identified during these audits.

- Commercial Direct Install Program: The City install web enabled programmable thermostats and screw-in based LED lamps for commercial customers at no cost to the customer.
- Commercial Lighting Program [Non-Res Lighting]: The City offers rebates to business owners who invest in the installation of energy efficiency lighting upgrades. There is a prevalence of T-12 lighting throughout the city and most high bay lighting uses high intensity discharge fixtures instead of more efficiency fluorescent fixtures.
- Commercial Custom Program [Non-Res Comprehensive]: The City offers rebates to business owners based on site-specific consumption. Rebates are tailored to the individual business owner's needs based on the audit and the potential energy savings associated with the customer project.

EM&V

The City selected ERS to perform EM&V on the Web Enabled Programmable Thermostat pilot. The evaluated savings were considerably lower than initial savings estimates. CSLs WEPT pilot and subsequent EM&V will be useful to the region in establishing savings for this measure moving forward.

Sources of Energy Savings

The TRM was the source for the savings for the majority of the measures. For the web enabled programmable thermostat pilot, the initial provisionally deemed savings estimates referenced the NW Regional Technical Forum work papers. The actual WEPT savings reported in the FY15 E3 are from the EM&V report performed by ERS. Custom calculations were used for measures not included in the TRM.

Complimentary Public Benefits Programs

- Low-Income Programs: The City funds low-income programs Salvation Army "SHARES" (onetime payment assistance) and Lifeline Discount (income qualified monthly discount); FY15 budget: $100,000

CITY OF SHASTA LAKE – FY 2014/2015 ENERGY EFFICIENCY RESULTS

Shasta Lake		Resource Savings Summary									Cost Summary			
Program Sector (Used in CEC Report)	Category	Units Installed	Gross Coincident Peak Savings (kW)	Gross Annual Energy Savings (kWh)	Gross Lifecycle Energy Savings (kWh)	Net Coincident Peak Savings (kW)	Net Annual Energy Savings (kWh)	Net Lifecycle Energy Savings (kWh)	Net Lifecycle Gas Savings (MMBtu)	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)	Utility ($/kWh)
Appliances	Res Clothes Washers	11		2,824	31,064		875	9,630		5	$1,150	$2,447	$3,597	$0.48
HVAC	Res Cooling	2,461	7	10,866	183,055	5	7,793	128,495		79	$24,858	$20,588	$45,445	$0.51
Appliances	Res Dishwashers	13		754	7,540		452	4,524		2	$690	$1,151	$1,841	$0.51
Consumer Electronics	Res Electronics													
HVAC	Res Heating													
Lighting	Res Lighting	70	1	1,390	19,020		858	11,649		6	$343	$3,327	$3,670	$0.43
Pool Pump	Res Pool Pump	5		3,370	33,700		2,022	20,220		10	$1,700	$5,146	$6,846	$0.43
Refrigeration	Res Refrigeration	30		3,900	54,600		2,730	38,220		21	$3,800	$13,077	$16,877	$0.60
HVAC	Res Shell	15,915	16	15,915	315,604	4	4,456	88,369		50	$10,368	$8,260	$18,629	$0.32
Water Heating	Res Water Heating													
Comprehensive	Res Comprehensive													
Process	Non-Res Cooking													
HVAC	Non-Res Cooling	23		10,937	54,683		8,749	43,746		27	$23,000	$236	$23,236	$0.61
HVAC	Non-Res Heating													
Lighting	Non-Res Lighting	773	36	398,601	5,049,870	29	318,911	4,040,076		2,239	$136,498	$8,621	$145,119	$0.05
Process	Non-Res Motors													
Process	Non-Res Pumps													
Refrigeration	Non-Res Refrigeration	1	9	77,635	931,620	7	62,108	745,296		393	$15,527	$1,240	$16,767	$0.03
HVAC	Non-Res Shell													
Process	Non-Res Process													
Comprehensive	Non-Res Comprehensive													
Other	Other													
SubTotal		19,302	68	526,192	6,680,756	46	408,955	5,130,225		2,831	$217,934	$64,093	$282,027	$0.07
T&D	T&D													
Total		19,302	68	526,192	6,680,756	46	408,955	5,130,225		2,831	$217,934	$64,093	$282,027	

EE Program Portfolio	TRC Test	**0.96**
	PAC Test	**2.14**

Excluding T&D

SILICON VALLEY POWER (SVP)

Silicon Valley Power at a Glance

- Established in 1896
- Climate Zone 4
- 53,154 retail customers; 84% are residential; 15% are commercial & industrial; 1% are municipal
- Retail Sales Breakdown: 7.5% residential, 3.1% commercial, 88.7% industrial, 0.7% municipal (Note that commercial and industrial customers are categorized by their rate code, and not type of business performed at the location.)
- The amount budgeted for energy efficiency programs in FY 14-15 was $9,000,000. The total amount actually expended was $4,395,873. All funding for energy efficiency programs comes from the Public Benefits Charge on customers' utility bills. Unexpended energy efficiency dollars are typically rolled over into the following fiscal year's energy efficiency programs. However, at the end of Fiscal Year 2014-2015, SVP had built up a larger than usual reserve, so SVP will be reallocating a portion of the unexpended commercial energy efficiency program funds from previous years to fund the FY 2015-2016 PV rebates that were being funded through other utility budgets. This was also done in FY 2013-2014 with unexpended energy efficiency funds for FY 2012-2013
- 75.6% system load factor
- Load growth projected at 1.5% for Fiscal Year 2015-2016

Silicon Valley Power Overview

Over the past several years, Santa Clara has experienced the effects of the economic recession, along with the rest of the country. The number of customers participating in our Low Income Financial Rate Assistance Program more than doubled during that period as customers were laid off from work and the numbers remained relatively stable for several years as they went back to work in lower paying jobs. For the first time since the recession, we have seen a significant drop in the participation rate for our Low Income Financial Rate Assistance Program and numbers are back where they were before the recession.

Businesses in Santa Clara survived relatively well, and we continued to see load growth during the recession and beyond due to the load that new data centers have been bringing online the last few years. However, most companies are still working with leaner staff and tighter budgets than they did previously, so we are seeing fewer energy efficiency projects due to lack of time and funding. This trend remains in effect, even as the economy has continued to improve.

Silicon Valley Power is unique in its mix of customers. While 84% of the customers are residential, nearly 92% of the utility retail sales are to commercial and industrial customers. Approximately 50% of our electric load is attributable to our largest "Key" Customers. Historically, it is those customers, including the large data centers, who implement a few large projects each year that make up the majority of our energy

savings for the year. In Fiscal Year 2014-2015, we saw fewer of these projects, which is partly due to lack of staff and budget, and partly due to the fact that these customers have been aggressively implementing energy efficiency measures for more than a decade and the opportunities for improvements are fewer and have long payback periods. Some of the energy efficiency measures that are still being implemented include IT improvements, for which SVP does not have an incentive program. Therefore, while these savings are being achieved in our community, like the energy savings from codes and standards, they are not accounted for in this report.

Major Program Changes

For FY 2014-2015, Silicon Valley Power launched a $300 Electric Heat Pump Clothes Dryer Rebate when the first models became available in the U.S. We also launched three direct install programs targeted at our commercial and industrial customers. They are:

- Small Business Snapshot Audit & Direct Install program – this program targeted customers with a demand of 200kW or less and provided a free "snapshot" audit and report for the facility's energy use, as well as the installation of energy efficiency measures such as LED lighting, low flow shower heads and pre-rinse spray valves. Note that water measures were only available to customers with electric water heating.
- CoolerMiser Direct Install Program – This program installed CoolerMisers on refrigerated cases stocked with non-perishable items and reduces their energy consumption.
- Keep Your Cool Program – This program installed energy-efficient refrigeration equipment including strip curtains, door closers, motors, LED case lighting, and various controls.

Program Highlight

Small business customers are traditionally considered a "hard to reach" market segment. They don't spend much time thinking about ways they can lower their energy bills and don't typically have the bandwidth to research options for energy efficient equipment. These customers don't have an energy manager and are often focused on running their day-to-day operations and staying in business. Silicon Valley Power contracted with Efficiency Services Group (ESG) to provide a Snapshot Audit and Small Business Direct Install Program to address this customer segment. In order to be eligible, customers had to have a demand of 200kW or less. The program was designed to be a high penetration, low cost program with a focus on the customer experience, as well as achieving energy savings. No opportunity was too small under this program, and businesses with only a few lights to be retrofitted were still served.

Field representatives went door-to-door to eligible businesses to market the program, provide a free "snapshot" energy audit with a report for energy-saving recommendations, and install specified energy efficiency measures at no cost to the customers. Measures included items such as:

- ENERGY STAR® LED Screw-In Lamps (replacing incandescent 50W or greater)
- ENERGY STAR LED MR16 Pin-Based Lamps (replacing halogen MR16)
- Bi-Level Stairwell Retrofits (replacing 4-foot T8)
- Exterior Lighting Retrofits (replacing Metal Halide, High Pressure Sodium or Mercury Vapor)

- Low Flow Showerheads (customers with electric water heating; replacing 2.5 gallons per minute or greater)
- Pre-Rinse Spray Valves (customers with electric water heating)
- LED Open Signs (replacing neon open sign with high voltage magnetic transformer)

During Fiscal Year 2014-2015, 2,224 small business facilities received Snapshot Audits. Of those, 1,040 had an energy efficiency retrofit project completed. A total of 1,346,449 kWh in first-year gross energy savings and a peak demand savings of 241 kW was achieved. A total of 8,869 energy-efficient products were installed, which included the following:

- 170 LED Open Signs
- 1,565 MR16 LED Replacements
- 975 Exterior LED Lights
- 6,146 Interior LED Lights
- 13 Pre-rinse Spray Valves

Program Descriptions

Res Lighting

- LED Light Bulb Rebates: SVP offers a $5 rebate per Energy Star LED bulb under 1,000 lumens, and a $10 rebate per Energy Star LED bulb 1,000 lumens or greater. This differentiation is due to the fact that there are very few bulbs over 1,000 lumens on the market and they are more expensive. The higher rebate buys down this cost for the residential customers and encourages manufacturers to provide a larger variety of bulbs that meet the needs for a brighter light.

Res Refrigeration

- Residential Refrigerator Rebates: Rebates encourage residents to purchase and install ENERGY STAR® labeled refrigerators and recycle their old units.
- Refrigerator Recycling: Rebate for recycling old refrigerators.

Res Cooling

- Energy Star Ceiling Fan Rebates: Provides a rebate of $35 per fan (up to three fans per residence) for the installation of Energy Star ceiling fans.

Res Water Heating

- Electric Heat Pump Water Heater: Provides a rebate of up to $1,000 for replacing an existing electric water heater with an Energy Star Heat Pump Water Heater.

Non-Res Lighting

- Commercial Lighting Rebates: This program provides rebates for energy efficient lighting upgrades.

Non-Res Cooling

- Commercial HVAC Rebate program: This program provides a rebate on the purchase and installation of new, more efficient air conditioners, HVAC systems, or heat pumps.
- Controls Rebate Program: This is a performance-based incentive for controls systems under a pilot rebate program. The incentive requires demonstrated energy savings over a 5 year period and will make payments annually upon submission of a verification report.
- VFD Rebate: This program provides a rebate on qualifying variable frequency motor drives.

Non-Res Cooking & Non Res Refrigeration

- Food Service Equipment Rebate: This program provides a rebate for the purchase of qualifying energy-efficient commercial food service equipment. It includes a variety of equipment, including both cooking and refrigeration equipment.

Non-Res Process

- Data Center Efficiency Program*: The program is targeted to data centers with IT server loads greater than 350 kW or IT cooling loads greater than 100 tons. This program provides unique opportunities for energy-efficiency projects that may not otherwise fit into our standard rebate and customer assistance offerings.
- Uninterruptible Power Supply (UPS) Rebate: This program provides a rebate to customers who install Energy Star UPS equipment to protect enterprise servers, networking equipment, and large storage arrays.
- PC Power Management Rebate: This program provides a rebate on qualifying PC Power Management software that achieves a minimum energy savings of 125 kWh annually per PC.
- Plug Load Sensor Rebate: This program provides a rebate for smart power strips used in commercial facilities to reduce energy consumption from office equipment.

*Data center projects under these programs may include cooling measures, among others. However, since this is the essential cooling of servers and not for comfort of people, we consider these to be process loads.

Non-Res Comprehensive

- New Construction Rebate: This program provides an incentive to customers who exceed Title 24 by at least 10% on non-residential new construction projects.

Other programs that fall into multiple categories, depending on the energy efficiency measures implemented:

- Public Facilities' Energy Efficiency Program: SVP provides technical assistance and financial incentives for the expansion, remodel, and new construction of City of Santa Clara buildings. Included in this program are higher levels of rebates for qualifying equipment, energy management assistance, and a small budget for retro commissioning.
- City Facilities Energy Efficiency Loan Program: This program provides loans for approved energy efficiency measures implemented at City of Santa Clara facilities. Loans are paid back via the utility bill through the reduction in energy consumption.

- Customer Directed Rebate: This program provides a rebate for energy efficiency projects that do not qualify for our other rebate program offerings, but have demonstrable energy savings.
- Residential Low Income Direct Install Program: This program is targeted at residential customers on our Financial Rate Assistance Program who have nearly twice the energy consumption annually as our average residential customer. The program is implemented by a third party, with the primary goal being to reduce the customer's energy consumption through both energy efficiency measures (of a wide variety), as well as education on conservation/behavior measures. No energy savings is claimed for the energy conservation/behavior measures.

Other programs educational in nature that do not fall into a category for energy savings:

- Business Audits: Free energy efficiency audits to business customers.
- Residential In-Home Energy Audits and Education: Through this technical support program SVP staff provides on-site audit analysis, energy efficiency recommendations and distributes energy saving items ("lime lite" night lights, outlet gaskets and switch plate thermometers). The Solar Explorer and the SVP information booth participate in major city events, providing education on energy efficiency and solar electric generation systems.
- LEED Rebate for Energy Efficient Building Design: If a building meets LEED criteria and exceeds Title 24 energy requirements by at least 10 percent, this program provides tiered rebates, depending on the status of LEED achieved.

EM&V

Silicon Valley Power's EM&V plan and reports for the past six years can be found at http://www.ncpa.com/policy/reports/emv/. For FY 2014-2015 programs, SVP has opted to have its third party commercial & industrial programs evaluated by The Cadmus Group. This includes the Small Commercial Direct Install Program, the CoolerMiser Direct Install Program, and the Keep Your Cool program, which is a direct install program for commercial refrigeration measures. The report is anticipated to be ready by mid-March 2015 and will be posted with the previous reports on the NCPA website. The EM&V budget averages $75,000 per year, but actual spending varies, depending on the EM&V needs for the year.

Sources of Energy Savings

Silicon Valley Power uses the POU Technical Reference Manual (TRM) for its energy savings. This can be found at http://cmua.org/energy-efficiency-technical-reference-manual. The lighting calculator used for our commercial lighting rebates can also be found here. The exception to using the TRM is for custom projects, typically funded under our Customer Directed Rebate program, where no deemed values or savings calculators exist in the TRM. For those projects, the customer must submit an M&V plan to be approved by Silicon Valley Power, which may include the use of industry-accepted models or actual pre- and post-measurement data.

Complimentary Programs

- Renewable Energy Programs:
    - Santa Clara Green Power Program: Residents can purchase 100% renewable energy through this voluntary program. The cost for residents and small businesses is a penny and a half per kWh. Larger companies who do not wish to purchase 100% renewable energy may purchase in 1,000 kWh blocks. Block pricing can vary depending on the location of the resources (CA vs. Western U.S), the size of the purchase, and the duration of the purchase commitment.
    - Residential Solar Photovoltaic Rebate: Provides significant financial incentive to residential customers for installation of solar systems. Customers receiving the rebate are required to also complete an energy audit, as is the case with the statewide California Solar Initiative. The rebate started at $4.50 per watt and under a declining scale similar to the California Solar Initiative program, and is currently at $1.25 per watt, up to a maximum system size of 10 kW.
    - Business Solar Photovoltaic Rebate: Provides financial incentives for the installation of solar systems at business sites. Rebate structure is designed to decline over time as more PV is installed in SVP's service territory, similar to the California Solar Initiative program. Businesses can receive rebates up to a total of $300,000 per customer for systems up to 100 kW. While the rebates started at $3.00 per output watt, current rebate level have declined at the time of this report to $0.90 per watt. Businesses installing systems between 100kW and 1 MW are eligible for a Performance Based Incentive. These incentives started at $0.40 per kWh and are currently at a rebate level of $0.12 per kWh at the time of this report. Businesses are required to complete an energy audit in order to receive a rebate, as is the case with the statewide California Solar Initiative.
    - Neighborhood Solar Program: SVP customers have the option to pay into a special fund to support the installation of solar electric systems at non-profit community buildings. TTo date, installations have included PV systems at Haman Elementary School, Valley Village Retirement Community, Bill Wilson Center, Hope Services, St. Justin's Parish, Our Lady of Peace Church, and the Muslim Community Association (MCA).

- Low-Income Programs: Our low income programs include a Rate Assistance Program, where qualified low-income customers receive a 25% discount on their electric bill (low-income program), as well as a Low Income Direct Install Program, which is described in the energy efficiency programs section of this report.

- Research, Development, and Demonstration:
    - Emerging Technologies Grant: This program encourages businesses to demonstrate new products and product applications not yet commercially viable in today's marketplace, install energy efficient technologies not generally known or widely accepted, yet show potential for successful market growth, successfully apply energy efficiency solutions in

new ways, or introduce energy efficiency into industries or businesses that are resistant to adopting new technologies or practices.

- APPA DEED Program: Silicon Valley Power is a paying member of the American Public Power Association (APPA) Demonstration of Energy and Efficient Design (DEED) and currently occupies a seat on the DEED Board. This program funds grants, internships and student scholarships to further R&D in the electric utility industry and support innovative applications of energy efficient or renewable technologies. In Fiscal Year 2014-2015, SVP applied for and was awarded a DEED grant for a "Field demonstration and performance validation of a CO2 heat pump water heater/space heat combination system" in conjunction with Pacific Northwest National Laboratory. The remainder of the study will be funded through Public Benefits Funds under the R&D budget. The study will begin in the Fall of 2015 and be complete by May 2017.
- California Lighting Technology Center (CLTC): Silicon Valley Power provides financial support to the CLTC to further research and testing of emerging technologies in the area of lighting.
- Super-Efficient Dryer Initiative (SEDI): Silicon Valley Power provides financial support to SEDI to further research and testing of emerging technologies in clothes dryers, such as the Energy Star Emerging Technology Award-winning Clothes Dryers, which came on the market within the last two years, and the Heat Pump Clothes Dryer, which became commercially available in the United States in 2015, and holds significant promise for energy savings.

SILICON VALLEY POWER – FY 2014/2015 ENERGY EFFICIENCY RESULTS

Silicon Valley		Resource Savings Summary									Cost Summary			
Program Sector (Used in CEC Report)	Category	Units Installed	Gross Coincident Peak Savings (kW)	Gross Annual Energy Savings (kWh)	Gross Lifecycle Energy Savings (kWh)	Net Coincident Peak Savings (kW)	Net Annual Energy Savings (kWh)	Net Lifecycle Energy Savings (kWh)	Net Lifecycle Gas Savings (MMBtu)	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)	Utility ($/kWh)
Appliances	Res Clothes Washers	43		9,155	95,797		5,488	56,200		28	$4,300	$18,935	$23,235	$0.53
HVAC	Res Cooling	12	2	672	6,720	2	672	6,720		4	$3,540	$4,603	$8,143	$1.53
Appliances	Res Dishwashers													
Consumer Electronics	Res Electronics	2		48	384		48	384			$158	$150	$308	$0.97
HVAC	Res Heating													
Lighting	Res Lighting	2,130	2	28,238	364,316	2	19,751	237,004		119	$16,177	$108,086	$124,263	$0.71
Pool Pump	Res Pool Pump													
Refrigeration	Res Refrigeration	395	38	200,528	1,105,384	27	140,401	774,214		420	$15,967	$287,104	$303,071	$0.46
HVAC	Res Shell	13,909	1	14,959	288,610		14,198	281,000		159	$14,008	$105,205	$119,213	$0.65
Water Heating	Res Water Heating	2		3,008	30,080		1,805	18,048		10	$1,988	$6,345	$8,333	$0.58
Comprehensive	Res Comprehensive													
Process	Non-Res Cooking	1		1,807	21,684		1,084	13,010		7	$200	$106	$306	$0.03
HVAC	Non-Res Cooling	1,058	77	2,266,638	6,046,796	66	1,926,642	5,139,776		3,128	$203,101	$90,604	$293,705	$0.07
HVAC	Non-Res Heating													
Lighting	Non-Res Lighting	36,434	783	7,777,879	121,464,780	666	7,047,319	111,967,500		62,051	$1,971,622	$731,724	$2,703,346	$0.03
Process	Non-Res Motors	1	79	693,947	10,409,205	67	589,855	8,847,824		4,705	$63,720	$63,362	$127,082	$0.02
Process	Non-Res Pumps													
Refrigeration	Non-Res Refrigeration	991	20	325,320	2,261,619	12	227,292	1,389,071		732	$92,887	$13,292	$106,179	$0.10
HVAC	Non-Res Shell	1,590	5	241,816	251,200	5	205,626	215,010		120	$37,384	$6,048	$43,432	$0.21
Process	Non-Res Process													
Comprehensive	Non-Res Comprehensive	18	301	2,216,104	33,100,272	256	1,883,688	28,135,231		17,121	$116,029	$419,230	$535,259	$0.03
Other	Other													
SubTotal		56,586	1,309	13,780,119	175,446,847	1,102	12,063,870	157,080,994		88,604	$2,541,080	$1,854,794	$4,395,873	$0.04
T&D	T&D													
Total		56,586	1,309	13,780,119	175,446,847	1,102	12,063,870	157,080,994		88,604	$2,541,080	$1,854,794	$4,395,873	

EE Program Portfolio	TRC Test	**1.73**
	PAC Test	**4.65**

Excluding T&D

TRINITY PUBLIC UTILITY DISTRICT

Trinity (TPUD) At a Glance

- Created in 1982 as a result of the Trinity River Division Act of 1955, in which Congress provided mitigation for the economic devastation to the local economy resulting from the Act.
- TPUD is comprised of nine small substations serving 560 miles of distribution line.
- TPUD has a peak coincident demand of approximately 25 megawatts, which may occur in winter or summer.
- More than 60 percent of TPUD's load is residential and only two customers have a peak demand of more than 150 kilowatts.

TPUD Overview

The Congressional mitigation provides the Trinity River Public Utility District (TPUD) enough low cost and clean hydroelectric power to meet its entire load for the next several decades, but forbids the TPUD from selling any of the energy it does not need to meet load. TPUD serves small economically depressed area in northern California consisting of approximately 7,500 meters in mountainous terrain covering an area the size of Delaware.

Program Highlight

Since CY 2000 through CY 2015 TPUD public benefits expenditures on energy efficiency total approximately $590,000 and have resulted in kilowatt-hour energy savings equivalent of more than 313,000 kilowatt-hours.

Program Descriptions

- Weatherization Program: Provides incentives for installation of cost-effective weatherization measures including insulation and energy efficient windows in electrically heated homes for all new buildings and major remodels, about 30 per year.
- High Efficiency Heat Pump Rebate Program: Provides incentives to replace wood stoves, propane furnaces/heaters, and kerosene heating systems with high efficiency electric heat pumps (TPUD's service territory has no natural gas availability).
- High Efficiency Electric Water Heater Rebate Program: Provides incentives to replace propane water heaters with high efficiency electric water heaters.

TRINITY PUBLIC UTILITY DISTRICT – FY 2014/2015 ENERGY EFFICIENCY RESULTS

Trinity PUD		Resource Savings Summary									Cost Summary			
Program Sector (Used in CEC Report)	Category	Units Installed	Gross Coincident Peak Savings (kW)	Gross Annual Energy Savings (kWh)	Gross Lifecycle Energy Savings (kWh)	Net Coincident Peak Savings (kW)	Net Annual Energy Savings (kWh)	Net Lifecycle Energy Savings (kWh)	Net Lifecycle Gas Savings (MMBtu)	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)	Utility ($/kWh)
Appliances	Res Clothes Washers													
HVAC	Res Cooling													
Appliances	Res Dishwashers													
Consumer Electronics	Res Electronics													
HVAC	Res Heating													
Lighting	Res Lighting													
Pool Pump	Res Pool Pump													
Refrigeration	Res Refrigeration													
HVAC	Res Shell													
Water Heating	Res Water Heating	93		113,448	1,134,480		68,069	680,688		364	$89,250		$89,250	$0.17
Comprehensive	Res Comprehensive													
Process	Non-Res Cooking													
HVAC	Non-Res Cooling													
HVAC	Non-Res Heating													
Lighting	Non-Res Lighting													
Process	Non-Res Motors													
Process	Non-Res Pumps													
Refrigeration	Non-Res Refrigeration													
HVAC	Non-Res Shell													
Process	Non-Res Process													
Comprehensive	Non-Res Comprehensive													
Other	Other													
SubTotal		93		113,448	1,134,480		68,069	680,688		364	$89,250		$89,250	$0.17
T&D	T&D													
Total		93		113,448	1,134,480		68,069	680,688		364	$89,250		$89,250	

EE Program Portfolio	TRC Test	**0.74**
	PAC Test	**0.71**

Excluding T&D

TRUCKEE DONNER PUBLIC UTILITY DISTRICT

Truckee Donner Public Utility District At a Glance (2015 Calendar Year)

- Established in 1927
- Climate Zone: 16 (winter, weekend, and holiday peaking electric utility)
- 13,559 retail customer connections (88% residential)
- Percent of retail sales by customer class – residential (54%) and commercial (46%)
- Budgeted amount for energy efficiency programs ($941,532), amount actually expended ($788,654) and funding sources (PB + Rates). TDPUD did spend $181,198 on public access electric vehicle charging stations which is not included in the above numbers. TDPUD moves money within energy efficiency programs and across PB programs to respond to customer needs. TDPUD's low-income program energy savings and costs are included in the above numbers since it includes an energy efficiency component. Energy savings and all associated costs from water conservation programs are also included.

Truckee Donner Public Utility District Overview

TDPUD serves electricity and water to the greater Truckee area comprised of approximately 44 square miles in eastern Nevada County and approximately 1.5 square miles in adjacent Placer County. TDPUD is governed by a locally elected Board of Directors consisting of 5 members with staggered 4-year terms and operates on a calendar year budget. TDPUD is a transmission-dependent utility within NV Energy's control area and secures electric resources primarily through the Utah Associated Municipal Power System (UAMPS). TDPUD has been successful in the past in transitioning to renewable energy sources, keeping rates stable, and investing in accessible, cost-effective, energy efficiency programs.

In 2015, TDPUD continued to invest in public benefit and electric vehicle programs spending over 5.41% of retail sales including 3.67% of retail sales spent directly on energy efficiency programs. TDPUD's energy efficiency results included a first year E3 'Gross' energy savings of 1.0% of retail sales, first year E3 'Net' energy savings of 0.7% of retail sales, and TRC of 1.39. TDPUD continues to deliver significant, cost-effective results aided by a customer base that embraces energy efficiency and conservation along with innovative program designs. However, a large portion of current savings come from residential lighting (CFL's and LED's) and other lighting programs. Maintaining these saving levels, on paper, is becoming increasingly difficult due, in part, to saturation but mostly due to the dramatic reductions in gross savings due to the miss-application of codes & standards and 'baseline savings' to actual energy efficiency retrofits. This is particularly true with screw-in residential lighting (EPA standards) and small business/commercial lighting retrofits (EPA standards & Title 24).

TDPUD treats energy efficiency as an electric resource ('first loading order') and is therefore motivated by actual savings. However, the E3 model does not consider actual savings and the E3 'Gross' savings are based on codes & standard baselines (not what was actually replaced). Thus, the savings and associated cost-effectiveness from E3 understate the true value of the energy efficiency resource. For example,

preliminary survey results indicated most customers are replacing 60W incandescent, not the 43 W halogen or CFLs.

Major Program Changes

- This is the first year that the EISA (Federal) lighting standards were applied as a baseline to screw in bulb measures and TDPUD saw a dramatic change in associated Residential programs (47% of our portfolio based on annual kWh savings).
- The E3 'Gross' and 'Net' energy efficiency results that the TDPUD is able to claim in this report are diverging further and further away from the actual result and TDPUD saw, for the second year in a row, a significant reduction in paper energy savings and TRC. While our performance remains relatively strong, it is getting harder to justify the very high levels of spending based on cost-effective results. Furthermore, the costs and complexity of Title 24 are a major burden for small business/commercial lighting projects which constitutes the vast majority of TDPUD's commercial customer base. This is causing our customers to either forgo projects, spread them out over multiple years to avoid the Title 24 thresholds, or do the project without pulling permits (and utility incentives).
- TDPUD's energy efficiency results in the past had a strong commercial lighting component but the savings that we are able to claim continues to drop. The fact is that we still have a significant amount of older lighting technology in our community (T12's, incandescent, etc.) which could be targeted for cost-effective retrofits but the inability to claim the full, actual savings makes these projects appear to not be cost-effective.
- TDPUD continues to invest in Staff and tools to make the delivery and tracking of our energy efficiency programs easy for the customer and more efficient for the utility. This includes a cloud-based program management tool with on-line rebate applications, improved website, social medial, and a contractor directory. TDPUD has also increased our customer service resources to more effectively serve customer demand and dramatically increased our communication and outreach efforts to move past the early adopters and penetrate all of our customer segments.
- TDPUD continues to invest in our most successful programs and to seek out new, cost-effective program opportunities. TDPUD is seeing strong demand for our new point-of-sale LED program, residential LED lighting rebate, refrigerator recycle rebate, appliance rebates which offers increasing incentives for CEE Tiers 2 & 3, and Residential Energy Surveys. Customers have embraced LED lighting technology as shown by a continued increase in LED rebates and a decreased interest CFL's.
- The multi-year drought in California continues to be of great concern to TDPUD's community and is creating economic hardship for those dependent on water/snow and the associated tourism industries. Focus on water, however, does open up the opportunity to engage the community on the benefits of conservation and efficiency.
- The funding for the energy efficiency programs increased slightly and spending remains very robust (3.67% of retails sales directly on energy efficiency programs). TDPUD did, in part due to

diminishing returns in energy efficiency, move $181,198 into Plug-In Electric Vehicle (PEV) charging stations. This included two new PEV charging station locations (Truckee Train Depot in historic downtown Truckee and Pioneer Commerce Center) with each location having two Level 2 chargers which are open to the public.

Program Highlight

- TDPUD's energy efficiency results included a first year E3 'Gross' energy savings of 1.0% of retail sales, first year E3 'Net' energy savings of 0.7% of retail sales, and TRC of 1.39. As stated above, we believe these figures overstate the true cost of the energy efficiency resource. The portfolio performance is solid and overall costs remain at or below TDPUD's cost to purchase and deliver power.
- TDPUD's Residential Energy Survey's remain a very popular program with customers. The 'visual survey' comes complete with over 20 free energy and water saving measures – including two free A19 LED bulbs - that are delivered at the end of the survey for free. This program allows customers to implement the 'low hanging fruit' immediately and the educational component empowers customers to pursue more complicated energy efficiency opportunities.
- Residential lighting remains a critical program area (TDPUD is 88% residential with a large number of vacation homes). TDPUD continues to effectively deliver residential lighting through our Residential Energy Survey's, low-income program, at numerous events throughout the community, and at our office. The vast majority of light bulbs delivered to our customers is done face-to-face and the customers must ask for the light bulbs. As stated previously, customers have embraced LED lighting and favor it over the CFL technology.
- TDPUD's LED Holiday Light Exchange remains very popular with ~3% of our customers visiting the conservation department in less than 1-month. Not only is the program cost-effective and very well received by our customers, but TDPUD takes the face-to-face opportunity to educate customers about other programs and to distribute free residential lighting.

Program Descriptions

- <u>Residential Green Partner Lighting Program</u> (Res Lighting): Encourages customers to replace incandescent and halogen light bulbs with energy efficient lighting by distributing, mostly in person and for free, 7-types of Compact Fluorescents (CFL's) to customers who visit the TDPUD Conservation Department or at a local event. CFL give-a-ways include a 12-pack of 60-watt equivalent spiral CFLs and up to 12 mix-n-match specialty CFLs.
- <u>Residential Lighting Rebate</u> (Res Lighting): Encourages customers to replace incandescent and halogen light bulbs with energy efficient lighting by providing incentives for Compact Fluorescent ($2 per CFL) and Light Emitting Diode ($5 per LED) screw-in or plug in lamps.
- <u>Residential Energy Survey – RES</u> (Res Lighting): Provides free residential energy surveys and free energy and water-saving measures including the installation of up to 24 energy efficient bulbs, and 2 low-flow shower heads at the time of survey. Customers are also informed about TDPUD conservation programs that they may benefit from and provided with associated literature.

- Residential Appliance Rebate (Appliance): Provides increasing incentives to customers to purchase more energy efficient appliances (clothes washers, dishwashers, and refrigerators) as identified by Energy Star and the Consortium for Energy Efficiency (CEE). Rebates range from $75 to $125.
- Refrigerator Recycle (Res Refrigeration): Promotes the recycling of older, working refrigerators and freezers by providing customers with free pick-up and a $30 rebate.
- LED Holiday Light Exchange (Res Lighting): Exchanges old incandescent holiday light strands with new, efficient Light Emitting Diode (LED) holiday strands for free. This one-for-one exchange (up to 66 feet of light strands) starts on the Wednesday before Thanksgiving and runs while supplies last.
- Energy Saving Program – ESP, Income-Qualified (Res Lighting): Provides a one-time bill credit and a free residential energy survey to income qualified customers. Customers are qualified by an intermediary agency and are eligible for a one-time credit equal to their highest energy charge in the past 12-months (not to exceed $200) upon completion of the required Residential Energy Survey (RES).
- Electric Home Weatherization Pilot (Res Shell): Provides weatherization improvements via direct installation to residential customers with electricity as their only heat source. Projects include an assessment, improvements and building envelope test.
- Watt Meter Loan (Not evaluated): Provides a free loan of a watt meter to help customers answer the question 'How much energy does that 110 VAC device use?'. Includes information about plug-loads and how to manage their energy use.
- High Efficiency Electric Water Heater Rebate (Res Water Heating): Provides an incentive of $2/gallon for new, qualifying electric water heaters that meet Energy Factor and other requirements. Maximum rebate $150.
- Residential Building Efficiency Rebates (Res Shell): Provides an incentive of up to $75 each for building envelope and/or duct air leakage tests and up to $250 (50% of project cost) each for building envelope or duct leakage mitigation.
- Thermally Efficient Windows Rebate (Res Shell): Provides an incentive of $5 per square foot of window to replace qualifying single-pane windows. Primary heating source must be a permanent electric space heating system.
- Water-Efficient Toilet Rebate (Non-Res Process): Encourages customers to replace high-water use toilets with low water use toilets (1.28 and 1.6 GPF) by providing increasing incentives for more efficient toilets. Rebates range from $25 to $100.
- Water-Efficient Toilet Exchange (Non-Res Process): Encourages customers to replace high-water use toilets with low 1.28 GPF water use toilets by offering a free toilet exchange or the option to apply a credit towards the purchase of any toilet carried by the exchange vendor that meets the program rules. Toilet exchange is conducted during regular business hours at a local toilet vendor.
- Customer Leak Repair Rebate (Non-Res Process): Provides a $100 incentive to help customers locate and repair a water leak on their property. Requires the use of a licensed contractor for the repairs.

- HE Clothes Washer Water Rebate (Non-Res Process): Provides a $50 incentive to customers who purchase a qualifying high water efficiency clothes washer. This is in addition to any applicable energy rebate.
- Residential Green Partners Water Program (Non-Res Process): Distributes, in person and for free, a variety of water saving measures to customers. Give-a-ways range from low-flow shower heads to sink aerators to hose spray nozzles.
- Patricia S. Sutton Conservation Garden (Not Evaluated): Promotes water-efficient landscaping by demonstrating, at the TDPUD's headquarters, native and drought tolerant plants, hardscaping/mulching techniques, and efficient irrigation. Plant lists, design, and materials used in the project are all available via a web-based resource at www.tdpud.org.
- Conservation Garden Party and Water-Wise Gardening Lecture Series (Not Evaluated): Encourages water-efficient gardening via lectures, access to local resources, and demonstrations.
- Neighborhood Resource Mobilization (Res Lighting): Delivers, through collaboration between a dozen local agencies, conservation programs directly to customers in a neighborhood block-party format.
- School Conservation Education (Res Lighting): Promotes energy and water conservation through an innovative series of programs designed to both educate students and deliver, for free, energy and water savings measures. 2015 handouts included a free LED A19 bulb for every elementary and middle school student in TDPUD's service territory.
- Contractor Directory (Not Evaluated): Provides a list of screened contractors for TDPUD customers who require the support of a licensed contractor to access TDPUD conservation programs. Contractor directory is managed by a partnership with the Electric and Gas Industries Association (EGIA).
- Business Green Partners Lighting Program (Non-Res Lighting): Provides energy efficient screw-in compact fluorescent (CFL) and light emitting diode (LED) bulbs, free of charge, to replace existing incandescent and halogen bulbs. TDPUD conservation specialist visits business to evaluate lighting needs and provide solutions.
- Commercial Lighting Rebate (Non-Res Lighting): Provides incentives to commercial customers for replacing inefficient lighting equipment with high efficiency lighting. Customers may receive a rebate equal to 1/3 of project cost (up to $10,000) for replacing old linear fluorescent fixtures with reduced wattage T8 fluorescent or LED fixtures. Other lighting retrofits may qualify for a rebate equivalent to projected first year energy saving.
- Commercial Refrigeration (Not Evaluated, no projects in 2015): Provides energy-efficient refrigeration controls, motors, case lighting, and infiltration barriers. Customers receive a comprehensive refrigeration energy audit and proposal for energy efficient refrigeration measures from TDPUD's installation contractor. Once the proposal is accepted the measures are installed at no charge.
- Commercial Custom Rebate (Non-Res Process): Provides incentives to commercial electric customers for replacing inefficient plant equipment with high efficiency equipment. Customers may receive a rebate equal to the projected first year energy savings.

- Green Building (Not Evaluated): Promotes green building standards and techniques through collaboration with and support of local agencies and non-profits.
- Business Green Partners Water Program (Not Evaluated): Distributes to business and commercial customers free water saving measures including pre-rinse spray valves, faucet aerators and shower heads. Custom water-saving projects are evaluated for cost-effectiveness, peak reduction, and opportunities to demonstrate new technologies.

EM&V

TDPUD operates on a calendar-year for financials and we strive to deliver our completed E3 model and EM&V reports by the March 15th deadline for this report. This is a very short time-frame (2 ½ months) but the alternative of presenting EM&V results more than a year after program completion would not allow for timely feedback and program improvements. It should be noted that, given this timeframe, TDPUD does occasionally make minor adjustments to the E3 model presented in this report and the final results in the EM&V report. TDPUD has been conducting EM&V on an annual basis since 2008 and plans to continue to do so. The budget for EM&V is ~$30,000 per year which is ~4% of program spending.

Sources of Energy Savings

TDPUD used a variety of sources for energy savings estimates including, but not limited to, California Municipal Utilities Association TRM, Pennsylvania TRM, Regional Technical Forum UES, DEER, and utility work papers.

TDPUD EM&V reports can be found at (http://www.tdpud.org/departments/conservation/em-v-and-reporting).

Complimentary Programs

- Renewable Energy Programs: TDPUD has a successful SB1 Solar Rebate program for our customers that is project to fully expend the funds before mid-2016. TDPUD also achieved an estimated 47% Renewable Portfolio Standard (RPS) in 2015 using the methodology defined by the California Energy Commission. TDPUD was able to transition our energy resource portfolio from primarily fossil fuel based in 2008 to a diversified mix that includes wind, solar, landfill gas, and small hydro while maintaining stable and competitive rates.
- Low-Income Programs: The TDPUD's income-qualified program, Energy Saving Program (ESP), was also described in the Program Descriptions as the participation requires that customers also implement energy efficiency measures. ESP provides a one-time bill credit and a free residential energy survey to income qualified customers. Customers are qualified by an intermediary agency and are eligible for a one-time credit equal to their highest energy charge in the past 12-months (not to exceed $200) upon completion of the required Residential Energy Survey (RES). TDPUD's income-qualified program achieves a solid return on investment for both the customer and utility.

- Research, Development, and Demonstration: It is not practical for a small utility like TDPUD to run direct RD&D programs. However, through the Northern California Power Agency, TDPUD does participate in the American Public Power Associations DEED R&D program, the FLEX lab project and TDPUD Staff does investigate new energy and water conservation products and programs. TDPUD is also exploring public access charging stations for plug-in electric vehicles and is testing an all-electric Toyota Rav4 in our fleet.
- Electric Vehicles: TDPUD installed two Plug-In Electric Vehicle (PEV) public access charging stations locations in 2015. Each location is monetized and has two, Level 2 PEV charging stations and are open to the public. One location is in the Truckee Train Depot in historic downtown Truckee and the other is located in the Pioneer Commerce Center. TDPUD has partnered with the Tahoe Regional Planning Agency (TRPA) on a Truckee-Tahoe PEV Readiness Plan and TRPA received a $200,000 grant from the California Energy Commission (CEC). TDPUD is positioned to respond to the new CEC GFO-15-603 "DC Fast Chargers for California's Interregional Corridors".
- Energy Storage: TDPUD has not identified any cost-effective energy storage projects for our customers or for a utility with our demand profile and size.

TRUCKEE DONNER PUBLIC UTILITY DISTRICT – FY 2014/2015 ENERGY EFFICIENCY RESULTS

Truckee Donner		Resource Savings Summary									Cost Summary			
Program Sector (Used in CEC Report)	Category	Units Installed	Gross Coincident Peak Savings (kW)	Gross Annual Energy Savings (kWh)	Gross Lifecycle Energy Savings (kWh)	Net Coincident Peak Savings (kW)	Net Annual Energy Savings (kWh)	Net Lifecycle Energy Savings (kWh)	Net Lifecycle Gas Savings (MMBtu)	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)	Utility ($/kWh)
Appliances	Res Clothes Washers	1	9	77,345	1,082,830	7	60,418	845,847	2,896	426	$33,175	$11,377	$44,552	$0.07
HVAC	Res Cooling													
Appliances	Res Dishwashers													
Consumer Electronics	Res Electronics													
HVAC	Res Heating													
Lighting	Res Lighting	7	40	654,582	7,283,287	28	456,658	5,029,278	14,018	2,531	$120,630	$247,644	$368,274	$0.10
Pool Pump	Res Pool Pump													
Refrigeration	Res Refrigeration	1	26	168,330	841,650	16	104,481	522,403		283	$16,695	$5,725	$22,420	$0.05
HVAC	Res Shell	3	13	11,692	210,916	10	10,411	187,849	2,838	106	$23,063	$22,321	$45,384	$0.36
Water Heating	Res Water Heating	1		617	8,021		487	6,337		3	$420	$144	$564	$0.12
Comprehensive	Res Comprehensive													
Process	Non-Res Cooking													
HVAC	Non-Res Cooling													
HVAC	Non-Res Heating													
Lighting	Non-Res Lighting	2	33	270,817	2,750,600	26	194,691	2,101,900		1,165	$95,057	$28,771	$123,828	$0.08
Process	Non-Res Motors													
Process	Non-Res Pumps													
Refrigeration	Non-Res Refrigeration													
HVAC	Non-Res Shell													
Process	Non-Res Process	6	26	223,477	2,065,956	19	168,306	1,574,630		837	$83,322	$100,309	$183,631	$0.15
Comprehensive	Non-Res Comprehensive													
Other	Other													
SubTotal		21	148	1,406,860	14,243,260	106	995,452	10,268,244	19,753	5,351	$372,362	$416,292	$788,654	$0.10
T&D	T&D													
Total		21	148	1,406,860	14,243,260	106	995,452	10,268,244	19,753	5,351	$372,362	$416,292	$788,654	

EE Program Portfolio	TRC Test	**1.41**
	PAC Test	**1.41**

Excluding T&D

TURLOCK IRRIGATION DISTRICT

TID at a Glance

- Established in 1887
- Electric service area in portions of Stanislaus, Merced, Tuolumne and Mariposa counties
- 101,370 customer connections
- 72% residential, 7% commercial, 1% industrial, 3.% agriculture
- Budgeted amount for energy efficiency programs $1,189,258, which is funded by our Public
- Benefits charge of 2.85% per AB1890.

TID Overview

TID continues to help customers achieve energy savings through the implementation and promotion of a variety of energy efficiency programs for all rate classes. Many programs provide rebate opportunities to encourage customers to conserve energy. A significant portion of the energy efficiency measures adopted by our customers were implemented by industrial and commercial segments. TID provides a variety of options for businesses that are looking to make changes in their existing systems by making upgrades or retrofitting their existing facility. Rebates are available that address areas such as lighting, compressed air systems, refrigeration systems, motors, gaskets, chillers and many other systems components.

Major Program Changes

TID did not make any major changes to our programs in 2015. The energy savings from our customers was very similar to the savings totals reported in 2014. The increase in our savings from 2014 to 2015 was a result of our residential behavioral modification program. 2015 was our second year of implementation of the behavioral modification program and the savings increased slightly from the first year of the program.

Program Highlight

TID's behavioral modification program, Home Energy Analysis, had the largest savings impact of our residential programs. The home energy analysis reports, graph how each household is performing compared to similar homes, have helped our customers save over 2 million kWh's. The majority of our residential customers are receiving the home energy analysis reports and the results have increased from 2014 to 2015. Our customers are reacting to the home energy analysis by installing energy efficiency measures and implementing behavioral changes. In addition to the analysis reports, TID is pleased to provide our customers with a customized web portal tool. The web portal includes an interactive home energy audit tool and provides helpful energy saving tips.

Commercial, Industrial and Agricultural Customer Programs

- Meter Manager: TID offers an on-line energy management tool for business customers so they can monitor their energy usage and utilize that information to more efficiently manage their energy consumption simply by logging into a secure web site.
- Energy Audits: TID offers free on-site energy audits to commercial, industrial and agricultural customers who have concerns, questions or an interest in implementing measures to manage their energy usage and reduce consumption.
- Commercial, Industrial, Agricultural Energy Efficiency Rebates: TID offers rebates along with comprehensive technical support for all commercial, industrial and agricultural customers to promote the purchase and installation of commercial equipment and systems that support and enhance load reduction.
- Commercial Rebate Programs: TID offers customers rebates for purchasing and installing:
    - Commercial Motors
    - Commercial Refrigeration
    - Network PC Management Software
    - Commercial Lighting
    - Advance Power Strip
    - Residential New Construction

Residential Customer Programs

- Home Energy Analysis: TID supplies our residential customers, a Home Energy Analysis (HEA) Report each month. The HEA provides the customer with information regarding their monthly usage compared to similar homes in our community or compared to their prior year(s) usage. In addition, a web portal gives our customers access to customize their home energy use, using the energy audit tool, and access to helpful energy saving tips.
- Residential Energy Audits: TID provides free in-home energy audits to customers who would like to learn how to reduce their energy use.
- Residential Rebate Programs: TID offers customers rebates for purchasing and installing:
    - Energy Star Refrigerator
    - Energy Star Room AC
    - Energy Star Clothes Washer
    - Whole House Fan
    - Shade Screens
    - Radiant Barrier
    - Solar Attic Fan
- Shade Tree Rebate: TID provides rebates for up to 3 trees per year that are planted to provide shade.
- Refrigerator Recycling: TID provides a rebate to customers to dispose of an old refrigerator or freezer and TID's contracted recycler will pick up and recycle the unit for free.

- New Construction Rebate: TID offers a rebate to home builders for exceeding Title 24 energy standards.

EM&V

TID is currently working on our 2014 & 2015 EM&V. TID has partnered with Modesto Irrigation District and Merced Irrigation District to have (1) report generated for our combined utilities. Since TID, MID and MeID have similar projects and similar customers a combined report provides economies of scale for each utility.

Our 2013 EM&V is available at:
http://www.ncpa.com/wp-content/uploads/2015/09/Merced-Modesto-Turlock-EMV-2015-Final.pdf

Sources of Energy Savings

TID has used the methodology of a not to exceed $.05/kWh for first year savings when analyzing program offerings. However, in some circumstances we exceed those parameters in an effort to offer customers a more diverse array of rebates. In 2014, TID's overall portfolio was $.02/kWh levelized utility cost.

Complimentary Programs

Low-Income Assistance Program

- TID CARES Program: An energy assistance program for qualified customers to receive a discount on their monthly energy bills. The CARES program reduces the monthly customer charge of $17 to $6, a savings $11, and provides a 15% discount on the first 800 kWh energy charges.
- Medical Rate Assistance: The District provides a 50% discount on the first 500-kWh energy charges for customers who use additional energy due to life-support equipment or a medical condition.
- Weatherization: TID has contracted with organizations within our community to provide weatherization services for families who meet the income qualification guidelines. The program enables families to reduce their energy bills by making their homes more energy efficient.
- Window Replacement: TID has a program to provide replacement of inefficient windows for families who meet the income qualification guidelines. The program allows customers to purchase windows for a discounted amount and requests them to install them on their own. Assistance is available for those are unable to install.

TID Renewable Energy Program Highlights

- Tuolumne Wind Project: TID purchased a 136.6 megawatt wind facility in 2008
- Solar: TID offers solar rebates for residential customers that are interested.
- Solar: In 2009, TID installed a 70.7 kW array of photovoltaic panels atop the newly renovated parking structure.

- Small Hydroelectric: TID was the first in California to construct small-scale hydroelectric power plants using its own canal system and those of neighboring irrigation districts that were not in the retail electric business.
- Combined the eight plants constructed, beginning in the mid 1970's provide a total of 20 megawatts of electric power. TID also owns and operates a 5 megawatt hydroelectric power plant at La Grange Dam on the Tuolumne River.
- Geothermal: In 1984, TID acquired an interest in a geothermal power plant in the Geysers Steam Field located in California's Lake County. The project has a capacity of generating 6.8 megawatts.
- In November of 2015, TID executed a 20 year Purchase Power Agreement for the full output of a 54 MW solar facility. The facility is currently under construction, and is expected to start generating mid-2017.

TURLOCK IRRIGATION DISTRICT – FY 2014/2015 ENERGY EFFICIENCY RESULTS

Turlock ID		Resource Savings Summary									Cost Summary			
Program Sector (Used in CEC Report)	Category	Units Installed	Gross Coincident Peak Savings (kW)	Gross Annual Energy Savings (kWh)	Gross Lifecycle Energy Savings (kWh)	Net Coincident Peak Savings (kW)	Net Annual Energy Savings (kWh)	Net Lifecycle Energy Savings (kWh)	Net Lifecycle Gas Savings (MMBtu)	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)	Utility ($/kWh)
Appliances	Res Clothes Washers	349		12,913	142,043		4,003	44,033		22	$12,215	$255	$12,470	$0.37
HVAC	Res Cooling	9,613	21	49,376	1,024,706	10	24,502	552,511		333	$34,935	$6,933	$41,867	$0.13
Appliances	Res Dishwashers													
Consumer Electronics	Res Electronics													
HVAC	Res Heating													
Lighting	Res Lighting	1,391		57,054	480,750		29,309	252,104		133	$9,838	$1,748	$11,587	$0.06
Pool Pump	Res Pool Pump													
Refrigeration	Res Refrigeration	503	22	155,036	1,111,132	16	108,541	777,964		422	$28,657	$21,130	$49,787	$0.08
HVAC	Res Shell													
Water Heating	Res Water Heating													
Comprehensive	Res Comprehensive	63,437		2,965,938	2,975,429		2,965,463	2,973,056		1,678	$139,184	$25,959	$165,142	$0.06
Process	Non-Res Cooking													
HVAC	Non-Res Cooling													
HVAC	Non-Res Heating													
Lighting	Non-Res Lighting	24	392	2,477,929	39,626,813	314	1,982,343	31,701,450		17,568	$130,204	$270,720	$400,924	$0.02
Process	Non-Res Motors													
Process	Non-Res Pumps													
Refrigeration	Non-Res Refrigeration													
HVAC	Non-Res Shell	6	142	227,704	3,433,161	114	182,164	2,746,529		1,528	$11,385	$22,932	$34,317	$0.02
Process	Non-Res Process	4	10	150,942	1,756,517	8	120,753	1,405,214		747	$7,547	$10,410	$17,957	$0.02
Comprehensive	Non-Res Comprehensive													
Other	Other													
SubTotal		75,327	588	6,096,891	50,550,550	461	5,417,078	40,452,860		22,431	$373,964	$360,086	$734,051	$0.03
T&D	T&D													
Total		75,327	588	6,096,891	50,550,550	461	5,417,078	40,452,860		22,431	$373,964	$360,086	$734,051	

EE Program Portfolio	TRC Test	**2.07**
	PAC Test	**6.31**

Excluding T&D

CITY OF UKIAH

City of Ukiah at a Glance

- Year established: 1987
- Climate Zone: 2
- Number of retail customers served: 7,788
- Percent of retail sales by customer class: 34% residential; 60% commercial; 1.1% industrial; 4.9% other
- Energy efficiency program budget: $125,000; energy efficiency program expenditures: $132,019
- Load growth: 0%

City of Ukiah Overview

The City of Ukiah (the City) remains committed to helping their customers manage their energy use through energy education and a comprehensive menu of energy efficiency incentives. The City's customer base has not typically responded well to a "standard" energy efficiency incentive program. The main reason for this is many customers do not have the discretionary income to fund energy efficiency projects. The City works to overcome this barrier by offering generous incentives to customers in order to persuade them to participate. However, even with generous incentives, participation in the commercial lighting program was still down in FY2015. Residential and commercial customers enthusiastically participate when the cost of their energy efficiency projects are covered in full by the City's incentive programs. The City includes seasonal energy saving tips with their customer's energy bills in order to increase awareness and promote energy education.

Major Program Changes

There were no major changes made to the programs in FY15. Since the majority of savings in FY14 came from the residential sector, the City shifted focus to the commercial sector in FY15. The commercial lighting program delivered the majority of program savings in FY15. There were fifteen commercial lighting projects completed through the program. The remaining savings were acquired through the Residential Weatherization Program, Residential Appliance Program, Residential Lighting Program, and two small commercial custom projects.

The City continued our energy education activity through flyer kiosks located in strategic locations and quarterly bill inserts offering energy saving tips and promoting the City's EE programs.

Program Highlights

The Commercial Lighting Program accounted for 83% of the kWh savings in FY15. The City also referenced the recently released Technical Resource Manual to greatly expanded the number of deemed measures and rebates available to our commercial customers.

The City's AB 2021 Energy Reduction Target for FY2014 was 450,000 kWh; the 235,926 net kWh's acquired represent 52% of the FY15 energy savings goal. The City's AB 2021 Demand Reduction Target for FY2015 was 104 kW; the programs delivered a net kW reduction of 66 kW, representing 63% of goal.

The City adopted targets of 448,000 kWh and 103 kW for FY16.

Program Descriptions

The City of Ukiah manages a comprehensive energy efficiency incentive program for residential & commercial customers focusing on peak load reduction and energy conservation. For residential customers, rebates are offered for the installation of various energy efficiency measures. For commercial customers, rebates are available for upgraded lighting, HVAC equipment and in cases where an analysis is performed rebates can be offered for additional equipment that reduces energy use and/or demand.

- Residential Audit Program [Res Comprehensive]: On-site energy audits are provided by energy specialists. Energy efficiency measures are recommended and additional visits are completed upon request.
- Residential Lighting Program [Res Lighting]: The City offers rebates to homeowners who install ENERGY STAR® qualified compact fluorescent lamps (CFLs), ceiling fans and LED holiday lights.
- Residential Cooling Program [Res Cooling]: The City offers rebates to homeowners who install high performance heat pumps, central air-conditioners, or evaporative coolers that exceed current state requirements. The City also offers a rebate for regular maintenance of cooling equipment (tune-ups every 3 years).
- Residential Equipment Program [Res Clothes Washers; Res Cooling; Res Dishwashers; Res Pool Pump; Res Refrigeration]: The City offers rebates to homeowners who purchase new ENERGY STAR qualified products, including clothes washers, room air conditioners, dishwashers, pool pumps, refrigerators and freezers. The City also offers a financial incentive for the recycling and decommissioning of secondary refrigerators and freezers.
- Residential Weatherization Program [Res Cooling; Res Shell]: The City offers rebates to homeowners who invest in weatherizing their homes, including air/duct sealing, attic/wall/duct insulation and window treatments/replacement.
- Residential Water Heater Rebate Program [Res Water Heating]: The City offers rebates to homeowners who purchase a new, energy efficient electric water heater.
- Commercial Audit Program [Non-Res Comprehensive]: On-site energy audits are provided by energy specialists. Energy efficiency measures are recommended and additional visits are completed in order to provide technical assistance for implementation of measures. Energy efficiency rebates are available for upgrades identified during these audits.
- Commercial Lighting Program [Non-Res Lighting]: The City offers rebates to business owners who invest in the installation of energy efficiency lighting upgrades.
- Keep Your Cool Program [Non-Res Refrigeration]: As funding allows from year to year, the City offers energy efficiency refrigeration equipment upgrades to business owners at no cost

- Commercial Custom Program [Non-Res Comprehensive]: The City offers rebates to business owners based on site-specific consumption. Rebates are tailored to the individual business owner's needs based on the audit and the potential energy savings associated with the customer project.

EM&V

The City plans to do a comprehensive evaluation of work performed over the last 3 years during FY2016. The City is currently exploring the opportunity of partnering with Gridley Municipal Utilities and Shasta Lake Utilities on this EM&V effort in order to gain economies of scale.

Complimentary Public Benefits Programs

- Renewable Energy Programs: The City funds a solar PV buy down program; FY15 budget: $150,000.

CITY OF UKIAH – FY 2014/2015 ENERGY EFFICIENCY RESULTS

Ukiah		Resource Savings Summary									Cost Summary			
Program Sector (Used in CEC Report)	Category	Units Installed	Gross Coincident Peak Savings (kW)	Gross Annual Energy Savings (kWh)	Gross Lifecycle Energy Savings (kWh)	Net Coincident Peak Savings (kW)	Net Annual Energy Savings (kWh)	Net Lifecycle Energy Savings (kWh)	Net Lifecycle Gas Savings (MMBtu)	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)	Utility ($/kWh)
Appliances	Res Clothes Washers	7		1,888	20,768		585	6,438		3	$675	$1,358	$2,033	$0.41
HVAC	Res Cooling	9,714	7	6,482	120,062	5	5,186	96,049		58	$9,872	$12,338	$22,210	$0.35
Appliances	Res Dishwashers	3		174	1,740		104	1,044		1	$160	$220	$380	$0.46
Consumer Electronics	Res Electronics													
HVAC	Res Heating													
Lighting	Res Lighting	144	1	1,906	25,840	1	1,029	13,954		7	$1,227	$5,577	$6,804	$0.67
Pool Pump	Res Pool Pump													
Refrigeration	Res Refrigeration	16	1	4,936	34,825	1	3,460	24,425		13	$1,700	$6,950	$8,650	$0.44
HVAC	Res Shell	25,090		25,408	505,030		7,114	141,408		80	$23,814	$8,959	$32,772	$0.36
Water Heating	Res Water Heating													
Comprehensive	Res Comprehensive													
Process	Non-Res Cooking													
HVAC	Non-Res Cooling	13	5	22,589	338,842	4	18,211	273,165		168	$9,069	$1,051	$10,120	$0.05
HVAC	Non-Res Heating													
Lighting	Non-Res Lighting	1	64	230,687	4,844,427	55	196,084	4,117,763		2,282	$40,596	$7,842	$48,438	$0.02
Process	Non-Res Motors													
Process	Non-Res Pumps													
Refrigeration	Non-Res Refrigeration	6		6,117	73,403		3,670	44,042		23	$770	$76	$846	$0.03
HVAC	Non-Res Shell													
Process	Non-Res Process	1		805	8,050		483	4,830		3	$625	$8	$633	$0.17
Comprehensive	Non-Res Comprehensive													
Other	Other													
SubTotal		34,995	79	300,992	5,972,986	66	235,926	4,723,118		2,638	$88,508	$44,379	$132,887	$0.04
T&D	T&D													
Total		34,995	79	300,992	5,972,986	66	235,926	4,723,118		2,638	$88,508	$44,379	$132,887	

EE Program Portfolio	TRC Test	**2.53**
	PAC Test	**4.19**

Excluding T&D

VERNON GAS & ELECTRIC

Vernon Gas & Electric At A Glance

- The City of Vernon began serving electric customers in 1933 and is comprised primarily of industrial and commercial customers.
- Established in 1905
- Climate Zone 8
- During the fiscal year ending 2014/15, the electric system served approximately 1,887 customers, supplied approximately 1,128 Megawatt hours, and had a peak demand of 191 megawatts.
- With less than 1% population of residential customers served in Vernon, the other 93% is comprised of commercial & industrial customers. The other 7% consist of Municipal facilities.
- The City of Vernon budgeted ½ million dollars to fund their energy efficiency programs, which $336,000 was actually spend. 2 million dollars was allocated to fund the new RPS pass-through for renewable energy and over a million was help fund the City of Vernon wind project.
- The forecasted future load growth in the City of Vernon is to see a 1 % jump but that depends on a lot of variables but a realistic goal is to maintain our current load with minimum setbacks.

Vernon Gas & Electric Overview

- To provide a host of programs that will enable business customers to conserve energy and utilize energy efficiently.
- To inform Vernon electric utility customers of the Public Benefit Programs and the associated benefits of participating in these programs.
- To monitor and evaluate the effectiveness of the programs.
- Meet or exceed energy efficient goals.

Major Program Changes

Vernon Gas & Electric has not made any a major changes in their programs but the 2014/15 fiscal year has pointed to the business community that energy saving can be achieved by looking into great detail to the operation process side of the their respectable businesses. The City of Vernon business community continues to explore smart efficient ways to be efficient. By focusing on more projects like compressors, heat conversion, and refrigeration controls the City of Vernon energy savings goals can be met.

Program Highlight

During the 2014/15 fiscal year, one of the City of Vernon top cold storage facility underwent an LED retrofit project for six of their facilities which resulted in over 1.7 million KWh energy savings.

Program Descriptions

- Customer Incentive Program: Fund the exploration and implementation of energy efficient technologies and equipment, such as lighting technologies, variable speed drives, air compressors, motors, refrigeration, and air conditioning. Provide cash incentives to businesses that install energy efficient technologies.

- Customer-Directed Program: Fund customized projects demonstrating energy and cost savings and/or commercial market potential in the area of energy efficiency. Customers must fund at least 25 percent of total project cost. Projects are only eligible if they do not qualify for any of the other programs.
- Energy Education & Demonstration Workshops: Provide customers with an array of information resources to encourage energy efficiency measures through energy efficiency workshops and other forms of customer outreach.
- Energy Audit Program: Provide on-site audits for commercial/industrial businesses. A comprehensive audit includes an analysis of energy usage and costs, identification of energy conservation measures, and recommended actions.
- Time of Use Rate Programs: All customers loads exceeding 100 kilowatts demand are eligible to receive time-of-use rate; enabling them to reduce their energy cost through time management of their energy usage.

EM&V

The City of Vernon continues to have numerous projects this past fiscal year which require an in depth analysis of the energy, measurement & verification of their projects to prove the validity of the energy savings. Since we have the distinctiveness of being a small commercial/industrial city, we can provide smart and efficient reports to our customers proving their worth.

Sources of Energy Savings

VG & E uses internal staff to confirm Post data, in conjunction using third-party & EM & V reports for verifications related to energy savings.

Complimentary Programs

- Renewable Energy Programs: Ongoing program

  City of Vernon Renewable Portfolio Standard (RPS) Pass-Through

  Procurement of renewable energy is one of the programs eligible for funding from public benefits charges. On June 19, 2012 City Council approved resolution No., 2012-97 authorizing the allocation of $2 million per year of the funds derived from the public benefits charge to offset the renewable power cost pass-through to customers.

  The 'Renewable Portfolio Standard (RPS) Pass-Through' is a tariff mechanism designed to recover the cost of complying with California environmental laws governing the use of renewable energy supplies by power generating facilities statewide. It consists of two costs components: incremental renewable power cost and net greenhouse gas cost. The incremental renewable power cost reflects the cost of renewable energy and fuels reduced by the cost of conventional power in the base rates and credits for AB 1890 funds authorized to offset the cost of pass-through to customers.

- Research, Development, and Demonstration:

  The City of Vernon Tehachapi wind energy on-going project located in Kern County, California is moving forward but the City is still collecting data, reviewing/addressing environmental issues, and discussing permitting with federal and local agencies. This particular project is a huge undertaking in scope which requires the City's due diligences to make this venture successful. This project is

ongoing which requires a lot patience's for this size of project. No quick answers on a project of this magnitude.

- Solar Incentive Program
  VG & E has two major solar projects in the works, one is a 355 KW AC and 476 KW AC systems. The completion date will be in 2016. The City of Vernon is expected more solar in Vernon in 2016.

- Vernon Demand Reduction Program
  Interruptible service provides: Can reduce 12.65 MW within 30 minutes in case of emergencies.

VERNON GAS & ELECTRIC – FY 2014/2015 ENERGY EFFICIENCY RESULTS

Vernon		Resource Savings Summary									Cost Summary			
Program Sector (Used in CEC Report)	Category	Units Installed	Gross Coincident Peak Savings (kW)	Gross Annual Energy Savings (kWh)	Gross Lifecycle Energy Savings (kWh)	Net Coincident Peak Savings (kW)	Net Annual Energy Savings (kWh)	Net Lifecycle Energy Savings (kWh)	Net Lifecycle Gas Savings (MMBtu)	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)	Utility ($/kWh)
Appliances	Res Clothes Washers													
HVAC	Res Cooling													
Appliances	Res Dishwashers													
Consumer Electronics	Res Electronics													
HVAC	Res Heating													
Lighting	Res Lighting													
Pool Pump	Res Pool Pump													
Refrigeration	Res Refrigeration													
HVAC	Res Shell													
Water Heating	Res Water Heating													
Comprehensive	Res Comprehensive													
Process	Non-Res Cooking													
HVAC	Non-Res Cooling													
HVAC	Non-Res Heating													
Lighting	Non-Res Lighting	2,242	561	2,764,386	16,586,316	448	2,211,509	13,269,053		7,859	$195,906	$70,047	$265,953	$0.02
Process	Non-Res Motors	1	23	96,017	1,440,255	14	57,610	864,153		482	$7,201	$3,769	$10,971	$0.02
Process	Non-Res Pumps													
Refrigeration	Non-Res Refrigeration													
HVAC	Non-Res Shell	1	528	4,181,620	4,181,620	449	3,554,377	3,554,377		2,159		$20,579	$20,579	$0.01
Process	Non-Res Process	1		92	1,380		78	1,173		1	$2,000	$5	$2,005	$2.39
Comprehensive	Non-Res Comprehensive													
Other	Other													
SubTotal		2,245	1,112	7,042,115	22,209,571	911	5,823,574	17,688,756		10,500	$205,107	$94,400	$299,507	$0.02
T&D	T&D													
Total		2,245	1,112	7,042,115	22,209,571	911	5,823,574	17,688,756		10,500	$205,107	$94,400	$299,507	

EE Program Portfolio	TRC Test	**5.54**
	PAC Test	**7.21**

Excluding T&D

VICTORVILLE MUNICIPAL UTILITY SERVICES

VMUS At a Glance

- The City of Victorville established VMUS in 2001 to provide safe, reliable and cost-effective service to retail customers that were building new facilities located in the designated service territory.
- VMUS began serving commercial and industrial customers in 2003 that reside in climate zone 14.
- VMUS receives wholesale power through its 33 kV and 12 kV switchgear equipment.
- VMUS serves approximately 56 non-residential meters.
- Peak demand for the utility was 15.1 megawatts (9.6% more than last year) and annual energy sales were 87,500 megawatt-hours (16.0% more than last year).

VMUS Overview

- Customers are served through 12,000-volt underground facilities with larger gauge ASCR conductors to improve system reliability and reduce system losses.
- VMUS evaluates circuit load performance to optimize performance and reduce system losses.
- VMUS purchases and installs efficient transformers to reduce system losses.
- All customers' facilities are twelve years old or less, occupying buildings that meet Title 24 requirements. This results in lower energy efficiency potential.
- The system load factor is 67.8%.
- The budget for energy efficiency and solar rebate programs was $284,049; and $39,135 was incurred for the period July 1, 2014 – June 30, 2015. Three energy audits were completed. No energy efficiency incentive payments were disbursed for the period July 1, 2014 – June 30, 2015.

Program Highlight

- Time-of-use rates and access to the client web portal provides customers with the information to assess the cost of their energy usage pattern and demand requirements.
- VMUS serves municipal facilities that can be interrupted as scheduled.

Program Descriptions

- Resource Planning: Ensure that energy efficiency is part of integrated resource planning by determining and implementing the most cost-effective, reliable, and feasible energy efficiency improvements.
- Energy Audits: On-site energy audit and recommendation designed to improve energy operating efficiency and reduce load requirements.
- Photovoltaic Incentive Program: Provides financial incentives not to exceed 50% of the total installed cost of a new solar energy system of $2.80 per watt or reimburse customers $0.10 per kWh over the next sixty (60) months for electricity produced by the installed solar energy system.
- Lighting Incentives: Provides incentives to improve energy efficiency for a variety of lighting applications, based on rate of $0.064/kWh for one year of energy savings but shall not exceed 50 percent of the cost of the lighting product/equipment.

- Construction Incentives: Reimbursement for the cost of equipment in construction projects that exceed state-mandated codes, federal-mandated codes, industry-accepted performance standards, or other baseline energy performance standards by more than 10 percent. The program payment is based on 25 percent of the cost difference between standard and upgraded equipment and/or materials, or $50,000, whichever is less.
- Energy Demand Reduction: Payment for the installation of energy efficient equipment/technology that permanently reduces peak demand and exceeds state-mandated codes, federal-mandated codes, industry-accepted performance standards or other baseline energy performance standards, based on rate of $100/kW for each on-peak kW that has been reduced, but shall not exceed 50 percent of the associated equipment/technology.
- Custom Energy Efficiency Incentives: Offers financial incentives for cost-effective energy-savings opportunities, not served by existing offerings, (including HVAC, motors, pumps, refrigeration, process and other) that reduces annual energy usage by at least 20 percent, based on rate of $0.064/kWh or $0.525/therm for one year of energy savings, but shall not exceed 50 percent of the cost of associated equipment/materials.
- Utility-Side Projects/Activities: Direct funding for projects/activities on the utility-side of the meter that promote a benefit customers in terms of improved safety, system integrity, energy efficiency, conservation, or research and development.

VICTORVILLE MUNICIPAL UTILITY SERVICES – FY 2014/2015 ENERGY EFFICIENCY RESULTS

Victorville		Resource Savings Summary									Cost Summary			
Program Sector (Used in CEC Report)	Category	Units Installed	Gross Coincident Peak Savings (kW)	Gross Annual Energy Savings (kWh)	Gross Lifecycle Energy Savings (kWh)	Net Coincident Peak Savings (kW)	Net Annual Energy Savings (kWh)	Net Lifecycle Energy Savings (kWh)	Net Lifecycle Gas Savings (MMBtu)	Net Lifecycle GHG Reductions (Tons)	Utility Incentives Cost ($)	Utility Mktg, EM&V, and Admin Cost ($)	Total Utility Cost ($)	Utility ($/kWh)
Appliances	Res Clothes Washers													
HVAC	Res Cooling													
Appliances	Res Dishwashers													
Consumer Electronics	Res Electronics													
HVAC	Res Heating													
Lighting	Res Lighting													
Pool Pump	Res Pool Pump													
Refrigeration	Res Refrigeration													
HVAC	Res Shell													
Water Heating	Res Water Heating													
Comprehensive	Res Comprehensive													
Process	Non-Res Cooking													
HVAC	Non-Res Cooling													
HVAC	Non-Res Heating													
Lighting	Non-Res Lighting													
Process	Non-Res Motors													
Process	Non-Res Pumps													
Refrigeration	Non-Res Refrigeration													
HVAC	Non-Res Shell													
Process	Non-Res Process													
Comprehensive	Non-Res Comprehensive													
Other	Other													
SubTotal														
T&D	T&D													
Total														

EE Program Portfolio	TRC Test	
	PAC Test	

Excluding T&D

APPENDIX B: 10-YEAR ENERGY SAVINGS TARGETS

The table below contains the 10-year energy savings targets for POUs in California, as required by §9505(b) of the Public Utilities Code. The targets were developed using the Energy Efficiency Resource Assessment Model (EERAM), developed by Navigant . For more information on utility-specific models, please see Appendices C& D in the 2013 version of this report, which can be downloaded at: http://cmua.org/wpcmua/wp-content/uploads/2013/03/FINALv3-SB-1037-AB-2021-Report-Appendices.pdf

All POUs – Annual Targets (MWh), 2014-2023

Utility	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	10-Year Total	% of Sales Forecast
Alameda	1,154	1,100	1,158	1,247	1,061	1,081	1,108	1,196	1,346	1,617	12,068	0.32%
Anaheim	24,026	24,425	24,228	25,742	24,585	24,842	25,254	25,480	25,567	25,204	249,353	1.01%
Azusa	2,570	2,585	2,568	2,573	2,342	2,438	2,411	2,567	2,386	2,316	24,756	0.95%
Banning	472	546	532	591	573	621	715	730	802	852	6,434	0.35%
Biggs	35	39	42	46	47	49	51	52	52	51	464	0.27%
Burbank	9,947	10,739	11,124	11,281	10,852	11,677	12,111	13,037	12,977	12,829	116,574	0.89%
Colton	966	1,273	1,614	1,759	1,911	2,137	2,435	2,610	3,804	3,712	22,221	0.64%
Corona	313	316	326	334	325	359	374	361	374	385	3,467	0.43%
Glendale	11,782	11,671	11,151	11,607	11,486	11,371	12,120	12,830	13,214	13,548	120,780	1.07%
Gridley	170	170	170	170	170	170	170	170	170	170	1,700	0.51%
Healdsburg	260	266	293	336	348	382	429	441	598	535	3,888	0.44%
Imperial	14,508	14,986	15,563	16,656	16,014	17,001	18,073	19,091	19,419	19,240	170,551	0.49%
LADWP	278,000	310,000	442,000	515,000	541,000	520,000	471,000	240,000	161,000	118,000	3,596,000	1.37%
Lassen	249	266	268	290	305	313	338	333	347	364	3,073	0.21%
Lodi	2,735	2,904	3,155	3,492	3,359	3,543	3,617	3,737	4,311	5,081	35,934	0.79%
Lompoc	168	186	203	229	195	212	232	246	258	268	2,197	0.16%
Merced	1,581	1,486	1,179	1,392	1,140	1,040	1,099	1,148	1,386	1,274	12,725	0.27%
Modesto	15,950	17,104	18,196	18,986	18,254	18,974	19,233	19,162	18,770	17,862	182,491	0.67%
Moreno Valley	286	276	269	277	251	272	284	303	304	309	2,831	0.17%
Needles	72	90	107	128	139	159	177	195	215	229	1,511	0.18%
Palo Alto	6,078	6,257	6,248	6,245	6,248	6,260	6,809	6,846	7,412	7,452	65,855	0.63%
Pasadena	12,750	12,750	12,750	12,750	12,750	12,750	12,750	12,750	12,750	12,750	127,500	1.00%
Pittsburg Power	140	134	122	123	128	124	122	120	125	122	1,260	0.65%
Plumas-Sierra	126	128	144	146	133	128	178	150	233	198	1,564	0.10%
Port of Oakland	91	97	101	104	103	106	108	111	108	105	1,034	0.15%
Rancho Cucamonga	441	449	470	509	550	598	600	656	634	711	5,618	0.51%
Redding	3,045	3,224	3,318	3,458	3,207	3,384	3,581	3,857	4,207	4,349	35,630	0.44%
Riverside	18,399	19,099	18,870	19,756	19,317	20,287	23,368	24,469	25,889	25,865	215,317	1.00%
Roseville	7,713	7,768	8,037	8,007	7,499	7,790	7,260	7,697	8,094	8,479	78,344	0.64%
SF PUC	4,353	4,353	4,857	4,857	4,857	2,970	2,536	2,806	2,806	2,806	37,201	0.35%
Shasta Lake	230	524	299	239	261	243	256	269	361	368	3,049	0.16%
Silicon Valley	24,076	24,387	23,079	22,848	22,407	21,274	20,961	20,174	18,923	18,282	216,411	0.66%
SMUD	172,000	175,000	178,000	180,000	182,000	184,000	186,000	187,000	189,000	191,000	1,824,000	1.52%
Trinity	68	86	103	122	118	143	161	180	203	219	1,403	0.14%
Truckee Donner	1,367	1,521	1,558	1,552	1,080	1,134	1,103	1,121	1,198	1,204	12,838	0.79%
Turlock	9,570	10,081	13,232	11,996	13,674	12,666	13,698	15,601	16,159	17,372	134,049	0.61%
Ukiah	450	450	448	428	364	404	395	391	414	423	4,167	0.32%
Vernon	6,417	6,631	6,609	6,664	6,592	6,561	6,454	6,377	7,060	7,065	66,430	0.51%
Victorville	102	124	146	172	202	231	260	291	341	370	2,239	0.31%
CALIFORNIA	632,660	673,491	812,537	892,111	915,847	897,694	857,831	634,555	563,217	522,986	7,402,928	1.08%

**TID's fiscal year is the calendar year and adopted goals for 2013-2022.